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Is there a trade-off between social responsibility and financial performance?

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ABSTRACT

There is growing evidence that institutional investors are willing to incorporate social and environmental goals in their investment decisions. Many of these social investors use social screens, engagement and/or community involvement to put into practice that socially responsible behavior. However, the question is whether these social responsible investors (SRIs) perform better or worse financially in terms of profits, is still unclear. The objective of this study is to examine the existence of a trade-off between social responsibility and corporate financial performance (profitability). In this research SRI is taken as a dummy variable (0,1) - an investor is socially responsible or not - to test the relationship between SRI and corporate financial performance, controlling for company size, risk, growth and company age. To put this into practice, this study employs panel data analysis using regression estimations with different specifications on a small sample of European and North-American companies (institutional investors) in the financial sector for the period 2000-2009. In general, social responsibility is found to be significant and negatively related to corporate financial performance, supporting the theory that there is a trade-off. More specifically, the empirical results show that socially responsible investors are less profitable than their conventional counterparts. In addition, the control variables size and risk appear to be significantly related to corporate financial performance in most cases, while growth and company age do not seem to matter.

Keywords: socially responsible investing; corporate financial performance; institutional investors

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LIST OF ABBREVIATIONS

AUM	Asset Under Management
AR(1)	First-order autoregressive errors
BLUE	Best Linear Unbiased Estimator
CFP	Corporate Financial Performance
CSP	Corporate Social Performance
d.f.	Degrees of freedom
DW	Durbin-Watson statistic
EMH	Efficient Market Hypothesis
ESG	Environmental, Social and Governmental issues
EU	Europe
Eurosif	European Sustainable and Responsible Investment Forum
FE	Fixed effects specification (one-way)
GLS	Generalized Least Squares
KLD	Kinder, Lydenberg, Domini Research and Analytics
LSDV	Least Square Dummy Variables
MPT	Modern Portfolio Theory
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
PRI	The Principles for Responsible Investment
SCP	Sustainable Corporate Performance
SEE	Social, Environmental and Ethical issues
SIC	Standard Industrial Classification code
SIF	Social Investment Forum
SRI	Socially Responsible Investing(Investor)
RE	Random Effects specification (one-way)

ROA	Return on Assets
ROIC	Return on Invested Capital
TBL	Triple Bottom Line
THREE P's	People, Planet and Profit
UK	United Kingdom
UNDP	United Nations Development Program
US	United States of America

1. INTRODUCTION

"*The lack of social responsibility by some large companies has militated for institutional investors to use their investment decisions as a way of encouraging companies to consider more actively issues related to society and environment*"

(OECD Roundtable on Corporate Responsibility,2007)

No one can deny that the world is changing. Recent environmental disasters, such as the BP oil spill, as well as the huge quantity of new data on the consequences of global warming like the climate change and ozone depletion, made investors aware of the indirect negative environmental impact of their daily business activities. Not only the environmental issues matter, but also the current financial crisis has contributed to global worry. We have seen some institutional investors that have taken irresponsible financial risks which led to harmful implications for the global economy. Aside from financial risks these investing entities also have to deal with ecological, political and socio-economic risks. Accordingly, sustainable development is one of the most urgent global challenges facing all of us today. Institutional investors have a fundamental role to play in this scenery by raising the pressure on companies to behave in a socially responsible way with respect to the stakeholders[1] they affect – both for current and future generations. Furthermore, institutional investors are able to use their ownership rights and they have the power to influence irresponsible companies to act more like "corporate" citizens. Another approach to use their power is to consciously exclude companies that harm people and planet from their investment universe. The preceding is known as socially responsible investing (SRI).[2] In brief, socially responsible investing provides the method through which investors can promote socially and environmentally sound corporate behavior (Scholtens et al., 2008; Sparkes and Cowton, 2004).

For an institutional investor, portfolio performance is related to corporate financial performance which in turn depends on, for example, the public awareness of climate change which is having an effect on investment values and leads to a more common practice of SRI.

[1] A stakeholder is; "any individual, group or organization who can affect or is affected – directly or indirectly – by the realization of company's objectives" (Freeman, 1984:25). Key stakeholders are employees, clients, financiers, stockholders, communities, government and the natural environment

[2] In this study, the terms socially responsible investing, socially responsible investor, socially responsible behavior and social responsibility are used interchangeably. The abbreviation for all is SRI

Socially responsible investors integrate social, environmental and economic concerns (this is better known as 'the three Ps' or triple bottom line (TBL) concept: people, planet and profit) into their daily business activities to create a positive effect on society and maintain sustainable development (Elkington, 1994). In fact, social investors[3] have a triple bottom line when it comes to their investment - people, planet and profit - returns, as these all ponder into their investment decisions (Magreehan, 2008). Generally, social investors expect companies to focus on social welfare in addition to value maximization (Renneboog et al., 2007).

There is a growing evidence that investors are willing to incorporate social and environmental goals in their investment decisions despite of the financial crisis. This is the case for the European and American SRI market, which are both thriving. Within the financial service industry it is known that institutional investors are more involved in SRI than other players in this industry.

Due to the fast growth of the SRI industry, scientific attention on this area has subsequently emerged. Much attention is paid to the corporate performance of social investors, whether or not they are performing better than conventional investors. In order to indicate this corporate performance, the triple bottom line (TBL) concept in accounting inherently comprises of two aspects, i.e. *corporate social performance (CSP)* in which the environmental concern is included and *corporate financial performance (CFP)* (Fauzi et al., 2009). Exploring the link between CSP and CFP has also been an ongoing discussion for forty years, ever since Milton Friedman wrote his well-known article "The social responsibility of business is to increase its profits" (Friedman, 1970). Since then, Friedman's perspective has been undermined by opponents and we all know now that his thinking is obsolete. For instance, many firms publish - apart from the financial annual reports - social annual reports that cover the TBL-concept. Besides, SRI has become a basic concept these days.

The fact that social investors will have a better CSP than conventional investors is obvious. All institutional investors, conventional or social, start the investment process with financial analysis. Contrastingly, social investors assess a company's social and environmental competencies as well. This has a direct positive effect on the social investors' CSP. But what about CFP? Do social investors perform better or worse financially in terms of profits? Notwithstanding a broad scientific research on this issue (Hamilton et al.,1993; Hutton et

[3] For the purpose of this paper I use the terms 'socially responsible investor' and 'social investor' synonymously.

al.,1998; Mill, 2006; Renneboog et al., 2008), this question remains unclear. According to De Keuleneer (2006) there is still limited empirical evidence found on this issue. Most SRI advocates (Kempf and Osthoff, 2007) are fairly confident that socially responsible investing can contribute to higher CSP and CFP levels. This so called outperformance or win-win hypothesis indicates that social investors are doing (financially) well by doing (socially) good and are just as profitable as conventional investors. This may be clarified by the fact that social investors have a smaller investment universe and therefore are more watchful to pick the most profitable investment options and at the same time avoiding risk. In addition, social responsibility is a positive indicator of good managerial behavior, which in turn could improve CFP. Furthermore, CSP or SRI reduces the cost of conflicts such as claims, environmental disasters and government fines, which again could make a company more financially attractive, and thus improves CFP (Renneboog et al., 2008: 1734). However, if this outperformance hypothesis truly holds, there would be no discussion at all. Apart from an absolute pessimist, even the most radical investors would then select a socially responsible investment strategy and would be pleased with a windfall profit.

What seems more interesting for both (institutional) investors and academics and is definitely a more cautious issue, would be to assume the existence of a trade-off between CSP and CFP. This study expects that social investors are more likely to generate less CFP than conventional investors in practice. One of the reasons is that the latter have the same opportunities as social investors to create profits by using the same investment universe and strategies. On the contrary, this does not count for the social investors which have a restricted investment universe which can affect the outcome negatively. Accordingly, social investors underinvest in financial attractive investments, which in turn worsens the CFP (Chong et al., 2006; Gezcy et. al., 2005; Schröder, 2004).

Given that social investors perform better in CSP and worse in CFP, the main objective of this study is to research whether there is a trade-off between people and planet (CSP) on the one hand and profit (CFP) on the other. Eventually, the core socially responsible investing issue at investors-level is to find a balance between people, planet and profit and thus becoming sustainable. To examine the existence of the trade-off, the hypothesis to be empirically tested is:

H1: Socially responsible investors are less profitable than conventional investors

In analyzing the hypothesis, factors that may affect financial performance, other than SRI, are taken into account as well. To test the hypothesis, this study employs regression analysis.

This research differs from prior SRI studies in several respects. First of all, the majority of studies measure the performance of SRI funds (Bello, 2005; Chong et al.,2006; Gezcy et al., 2005; Hamilton et al, 1993), indices (Boutin-Dufresne and Savaria, 2004; Schröder, 2003) or stock portfolios (Hong and Kacperczyk, 2006). On the contrary, this research measures the financial performance of institutional investors who invest socially responsible against their conventional counterparts. In this perspective, this study supports the argument that institutional investors are better off by not investing socially responsible due to the negative effect it might have on profitability. However, most researchers find a positive or no evidence at all on this link between social responsibility and profitability. Secondly, it is not yet common to study this link within the financial service industry, the focus of previous studies is mainly on manufacturing industries. Lastly, unlike most studies, this study examines the link between SRI/CSP and CFP over a significant period of time, from 2000 to 2009. During this period, especially since the financial crisis, a growing number of companies acknowledged the essence of SRI and the influence it has on society as well as on their own business.

The remainder of this study is organized as follows: chapter 2 provides an overview of literature on the area of socially responsible investing as well as the role of institutional investors. This chapter presents definitions, criteria and considerations relevant to the study. Further, it explains the practice of socially responsible investing within the institutional investors industry. The chapter closes with a literature review about performance. In Chapter 3 the data and methodology is discussed. The first section describes the data and sample selection, after which the empirical model and variables description is further explained. In the last section of this chapter the different estimation methods for panel data analyses are clarified. Chapter 4 reports the empirical results. Finally, Chapter 5 concludes this research, where the main findings are discussed, the hypothesis is generated and the limitations are explained.

2. LITERATURE REVIEW

2.1. The phenomenon of socially responsible investing

2.1.1 Introduction and definition

SRI means different things to different people and institutions. In addition, there is no standard definition or common language of SRI. There is widespread disarray about a range of expressions used to describe socially responsible investing (Sparkes and Cowton, 2004:46). In words of Steve Schueth (2003:190), socially responsible investing can be defined as the process of integrating personal values and societal concerns into investment decision making. Waddock (2003:369) sees SRI as a community that includes a broad variation of individuals and groups who are not just interested in return on investments. Notably, Renneboog et al. (2008:1723) has described it as an investment process that integrates social, environmental and ethical (SEE) considerations into investment decision making. The European Sustainable and Responsible Investment Forum (Eurosif)[4], describes socially responsible investing in their European SRI study 2008, as a generic term covering ethical investments, responsible investments, sustainable investments, and any other investment process that combines investors' financial objectives with their concerns about environmental, social and governance (ESG) issues (2008:6). Similarly, the global independent asset manager Aberdeen refers to such type of investing which is laid out in its responsible investing policy.[5] There is a difference in SEE and ESG issues. However, in scientific and practitioner literature SEE and ESG are regularly used interchangeably. The latter includes corporate governance issues together with environmental and social ones. Corporate governance captures aspects of a company's structure such as transparency, financial reporting, risk management, and shareholder rights. Its objective is to align the company's management and board's interests with those of the stakeholder groups. Corporate governance has become a major player in the field of SRI. (Eurosif, 2006:1). The variations among the above definitions reflect SRIs enlargement through time. As noticed before, SRI does not have a common language. Some call it 'ethical investing', some favor 'social investing'. Others use 'green investing', 'sustainable investing', 'mission-based investing' or

[4] Eurosif, European Sustainable and Responsible Investment Forum, is an association that represents the SRI industry at European level, established in 2001.

[5] Aberdeen Responsible Investing Policy and Process available at: http://www.aberdeen-asset.com/

'responsible investment'. Although it has no standard, in all cases SRI reflects an investing approach that integrates social or environmental concerns into investment decisions. Not only the investment decision making process (such as excluding firms from the investment universe) is important, but also the ownership practices after the investment is made. Ownership practices best known as shareholder activism, advocacy or engagement, describe the rights of an owner to positively influence the companies that they have invested in, on social, environmental and governance issues.

The term 'socially responsible investing' (SRI) will be used throughout this study, like most academics and practitioners (Bakshi, 2006; Glac, 2009; Kempf and Osthoff, 2007; Kinder, 2005; Schueth, 2003). This study defines socially responsible investing *as the integration of personal values and societal considerations*[6] *into the process of investment decision making and ownership practices, while at the same time maintaining investors' financial needs*.[7]

Generally, SRI combines two basic goals: corporate financial performance and social good. This dual goal is based on the following assumptions: first of all social investors believe in incorporating personal values and societal considerations into the business case. They assert that in the short run socially responsible investing will show a comparable financial performance to their conventional peers, while in the long run they will even obtain enhanced financial performance. Therefore, social investors reject the conventional conceptualization of financial industry as unethical, driven only by economic rationality (Richardson, 2007:211). Secondly, social investors believe that they have the ability as shareholders to encourage corporate conduct towards a stronger impression of social responsibility, thus 'doing good'. Together, financial performance and social good is the main feature of socially responsible investing (Zarbafi, 2009:3). After having clarified the definitions of socially responsible investing, the upcoming section is about the roots of the investment practice.

2.1.2 The roots of socially responsible investing

The phenomenon socially responsible investing is not new. Its roots can be traced back to ancient religious traditions (Reneboog et al., 2008:1725). Those religious traditions formulated a set of values and beliefs to make clear how money should be spent in a 'good'

[6] Societal considerations also includes environmental issues, community contribution and governance issue, such as the exercise of voting rights.
[7] With this definition I closely follow the Social Investment Forum (SIF), a membership association representing the SRI industry in the US.

proper way, and thus reflect an ethical approach to investing. Reasonably, this shows why in the past the term 'ethical investing' was used instead of 'socially responsible investing'.
From the beginning of the 18th century the religious groups practiced SRI by avoiding 'sinful' companies involved in the alcohol, tobacco, abortion, pornography and gambling industry. During the Vietnam War these groups and anti-war movements also divested all stocks in weapon-related companies to protest against US involvement in Vietnam. Through the 1960s and 1970s anti-war, anti-racist, and civil-right movements have made investors aware that their investments might generate negative externalities on society. These movements influenced the societal awareness of individual investors. Simultaneously, they contributed to the concept of modern socially responsible investing as we know today. Contrary to ethical investing which was based on religious activism, the new concept has matured into a broad program for socially and environmentally responsible financing (Sparks, 2006). The number of socially concerned investors rose significantly through the 1980s when the South-African racist system of apartheid came under serious attack by politically driven individuals and organizations. Global social investors forced companies and the South-African government to dismantle apartheid and requested investment managers to withdraw their money from Western (companies with South-African subsidiaries) and South-African companies. This boycott began to exercise influence social investors have on companies' behavior. As the power of investors increased and the government seemed less willing to take responsibilities on environmental and social concerns, shareholder activism (ownership practices) came forward as one approach to compensate for this imbalance (Bakshi, 2006:525).

Environmental disasters, such as the Bhopal gas leak, the Chernobyl nuclear power incident and the Exxon Valdez oil spill, as well as the huge quantity of new data on the consequences of global warming, made investors more aware of the indirect negative environmental impact of their daily business activities. Since the 1990s, a series of corporate scandals which concentrated on the deficiency of governance structures turned social responsibility into another dimension and added 'corporate governance' as additional criteria to the TBL approach. The latter resulted in the now frequently used term 'ESG' integration as criteria for investment analysis (Reneboog et al., 2008:3). The persistent global economic integration together with the continuous development of information and communication technology, have led to a growing focus on socially responsible investing.

Now that the development of socially responsible investing has been discussed, the next section will provide an overview of the different practices of socially responsible investing.

2.1.3 The practice of socially responsible investing

The goal of socially responsible investing is to combine financial corporate performance with social good. When it comes down to achieving this goal in practice, there are various investment strategies to implement. After studying the academic and practitioner literature (Kawamura, 2002; Schueth, 2003; Bakshi, 2006 and Richardson, 2007), as well as public responsible investing policies of relevant institutional investors such as Aberdeen Asset Management PLC, this study identifies three different strategies: s*ocial screening, engagement* and *community involvement.*[8] While social screening refers to *the investment decision making process*, engagement involves *ownership practices*. The last strategy, community involvement involves none of these practices, but depends solely on the investor's beliefs and values. These three strategies are reciprocally linked and cannot always be implemented individually.

Social screening

Through social screening, investors are able to exclude or include companies or industries that do not meet or do meet specific social, environmental and governance criteria considered by their financiers. Three different screening techniques are identified: *negative, positive and best-in-class.*

Negative screening is the oldest and most simple socially responsible investing strategy. It goes back to the values and beliefs religious groups had, which led to the avoidance of investing in companies criticized as unethical (Sparkes and Cowton, 2004:47). Excluding companies or industries from investments involved in controversial businesses such as, the violation of human rights, child labor, animal testing, nuclear energy and weapon manufacture etc., is called negative screening (Reneboog et al., 2008:1728). Other negative screens may include tobacco, alcohol, contraceptives, abortion, gambling and pornography and is also known as ethical screening.[9] While this traditional negative (ethical) screening strategy is still present today, investment criteria have altered considerably due to the changes in society. Alternatively, the positive screening strategy has become more convenient.

[8] It is important to note that SRI strategies can differ from one region to another. For instance shareholder activism is quite specific for the US, while the European market distinguish between broad and core SRI and uses the term 'integration' which goes further than shareholder activism (Eurosif, 2008). In addition, available data on SRI might differ as well.

[9] For the purpose of this study negative screening and ethical screening are used interchangeably

Positive screening implies investing in companies and industries that outperform in societal areas, and thus have a high and positive effect on society as well as expected financial returns (Kawamura, 2002:16). Unlike negative screening, this approach 'includes' companies based upon their social responsible behavior, and does not exclude them. Therefore, it does not penalize companies for not being socially responsible but rewards those companies with superior performance in, for instance, clean energy technologies or community involvement. Other positive screens focus on labor relations and corporate governance issues. The most commonly used positive screen is 'green' investing, which will also be used in selecting social investors in this study. The practice of positive screening is regularly combined with the '*best-in-class*' approach. This approach ranks companies within an industry or market sector based on socially responsible or triple bottom line criteria. This approach is also called 'sustainability' investing. Only those companies in each industry or market sector are chosen which exceed a minimum threshold (Reneboog et al., 2008:1728). In contrast with positive and negative screening, the best-in-class approach does not compare across industries or market sectors. Social investors are aware of the fact that there are no perfect companies. In general, the social screening process seeks to identify the best-managed companies. The outcome is the formation of investment portfolios that meet investors' social standards (Schueth, 2003:190). Investors' decisions on social standards for companies are personal. The meaning of a proper investment for someone who is concerned about human rights may not be the same for someone who regards environmental pollution as the fundamental issue**.** If they have classified their social priorities, social investors also take into account their tolerances. Like social priorities, tolerances are also purely personal. A social investor might accept some substandard performance on environmental matters but none on labor rights (Kinder, 2005:18). Finally, it is essential to note that social screening solely refers to the process of decision making to exclude or include companies from their investment universe based on societal criteria.

Engagement

As mentioned earlier, *engagement* involves the ownership practices of investors. Hence, this strategy looks at those actions where institutional investors exert influence on corporate behavior through their rights as shareholders after investments are made. In this study the concept of engagement consists of *dialogue* and *shareholder activism* (Eurosif, 2003:14; O'Rourke, 2002:3; Schmidt and Weistoffer, 2010:8). Once an investor is involved in a

company's management, he directly influences corporate behavior through dialogue. This direct dialogue is a continuous exchange between corporate management and the investors about the integration of social, environmental and governance issues into corporate policies and practices. A more sophisticated form of engagement is shareholder activism, also known as shareholder advocacy. In line with O'Rouke (2002:3), shareholder activism incorporates the following activities: *shareholder resolutions, proxy voting* and *divestment*. A *shareholder resolution* is a shareholder request to let the company's management take particular actions. This request may then be presented at annual general meetings for a vote to all owners of the company. To vote, shareholders do not have to attend the annual meetings, but can delegate their voting rights through *proxy voting*. The process of shareholder resolutions and proxy voting generates investor pressure on corporate executives to enhance corporate financial performance over time and improve welfare of all the company's stakeholders (Schueth, 2003:191). Accordingly, De Keuleneer (2006:44) finds this approach more convenient and efficient than social screening. According to Eurosif (SIF, 2003:31), engagement through direct dialogue is of greater focus in Europe, than filling shareholder resolutions or proxy voting, such as is exercised in the United States. Unlike social screening, shareholder activism is all about which companies should be lobbied and acted upon, rather than what companies to invest or not to invest in. Shareholder resolutions and proxy voting aim to influence corporate management positively. However, these strategies are often presented as a 'softer' alternative towards the more rigorous approach of excluding companies from the investment portfolio (Friedman and Miles, 2001:535). Particularly for those institutional investors who explicitly choose this passive attitude to only address companies on their "bad" behavior instead of excluding them, gives the impression that it is often used as an easy way for investors to maintain their whole investment universe. However, *divestment* the last activity of shareholder activism has turned out to be a more effective and harder way of changing corporate behavior. Divestment has merely the same objectives as exclusion-based screening, but the decision to divest is taken after the investment is made and does not longer meet socially responsible criteria. Investors who practice shareholder activism often consider divestment as the last resort.

Community involvement

The last strategy of socially responsible investing practices is *community involvement*. This study does not use the term 'community investing', which is more commonly used by

academics and practitioners (Eurosif, 2003; Glac, 2009; Kawamura, 2002; Schmidt and Weistoffer, 2010; Schueth, 2003) to describe this strategy. In most studies community investing represents the supply of capital to individuals and groups who have conventionally been denied access to capital and other financial services. The definition this study follows is much broader. Community involvement does not only include capital providing, but also engagement in philanthropy, sponsorship, donation and workers volunteerism (Reneboog et al, 2008). For instance, Investor AB provides sponsorship activities in the area of youth and education, while AXA investment managers involves in the community by philanthropy. Hence, both investors will be categorized as practicing community involvement. Nevertheless, there is a distinction in philanthropy and sponsorship activities. The former includes, for instance, the donation of money and services to support a socially beneficial foundation without expecting returns, while the latter expects some kind of 'earnings' as a result of their support. However, the line between both has begun to fade (Faulk, 2009). Community involvement is integrated in the US SRI industry, but is still an upcoming phenomenon in Europe. For a summary of the three strategies for the practice of socially responsible investing see figure 1 below.

Figure 1: The three strategies for the practice of socially responsible investing.

The next paragraph explains the role of institutional investors as main actors in practicing socially responsible investing.

2.2 The power of institutional investors

2.2.1 Characteristics of institutional investors

The focus of this study lies on institutional investors, which are a diverse group of investors that serve the capital (financial) market, such as investment and insurance companies, private investment banks and pension funds. Thus, institutional investors are financial intermediaries, whereby they or the asset managers[10] invest their own capital or collect assets and invest it in the capital market on behalf of others. A large number of these investors operate in the global economy and have an important function in allocating financial resources for individuals and institutions. When making investment decisions, these institutional investors have certain objectives to hold on with respect to risk, return and reputation. While different institutional investors have diverse preferences, one universal preference is the attainment of returns (Glac, 2009:44). According to the traditional finance theory, it is their fiduciary obligation to act in the best interest of their clients which is the maximization of shareholder value by achieving the highest return on their investments (Sullivan and Mackenzie, 2006:15). However, given the difference in the process of decision making, it is likely that the distribution of risk and return, as well the mutual liabilities between beneficiaries and institutional investors will differ (Davis and Steil, 2001:14).

Another characteristic of an institutional investor is the vulnerability of reputational attacks. These reputational attacks are two dimensional. First of all, a good reputation of the institutional investor itself gives a sign to the capital market that corporate `value' is expected to be maintained and improved. On the contrary, a poor reputation is often related to difficulties with the business strategy, poor corporate governance and perhaps lower returns. Secondly, the reputation of the companies they invest in is also of concern, which might have a direct effect on the portfolio returns through adverse current and future stock price fluctuations (Clark and Hebb, 2005:2021/22).

Furthermore, it is the size of the institutional investors that matters. In contrary to most individual investors, institutional investors can facilitate a portfolio with lower risk and higher rates of returns. As a group of professional investors, who are better informed about

[10] The concept of 'institutional investor' and 'asset or investment manager' are often combined together, yet in legal sense the asset or investment manager does not have to be a part of the institutional investor (Davis and Steil, 2001:12). As a matter of fact, asset management may be either internal or external to the institution itself. However, for the purpose of this study the two are used interchangeably.

past risk and return patterns, as well as their large size of asset under management (AUM),[11] they are able to diversify unsystematic risk[12] at lower average costs (Bosch and Schoenmaker, 2006:9). These lower average costs may also arise from the ability to transact in large volumes which in general leads to a reduction in commission charges. In addition, institutional investors are generally long-term investors, holding stocks for longer than a year. Some analysts declare that these long-term and large institutional investors have the power to change the way a company is run (McLaughlin, 2009:10).

Due to the divergence of interests among beneficiaries and institutional investors, principal-agent problems may occur. Academics use the principal-agent theory to determine whether agents do or do not proceed in their principals' interests. Agents (such as asset managers) behavior driven solely by self-interest may not always be fully aligned with those of the principals (such as beneficiaries). According to Davis and Steil (2001:13), another similarity that institutional investors face is the preference for liquid assets over non-liquid ones. Grompers and Metrick (1999:13) have found in their empirical study that institutions show a strong and significant demand for liquidity. The ability to collect and process information influences the decision to invest and is more decisive for institutional investors than individual investors in the capital market. On the other hand, the institutional investors rely on public information rather than private information, which strongly points out their need for liquidity. Finally, all institutional investors are covered by a smaller number of protective rules due to the fact that they are assumed to be better-informed and therefore are better able to care for themselves.

Now that the characteristics of institutional investors are clear, the next section proceeds with the power and responsibilities institutional investors can exercise on society.

2.2.2. Institutional investors as responsible owners

Institutional investors frequently consider financing or the providence of financial services to companies as a neutral activity. However, investing in a company obviously shows one's conviction that the company's goals are achieved by raising the capital it needs to carry them out. In providing capital to a company, an institutional investor gives its accordance to the objectives of this business (Vandenbroucke and Boer, 2009:20). For instance, investing in a company involved in the production of military equipment will fuel wars. Take a look at

[11] Asset under management is the market value of assets that an institutional investor manages on behalf of others.
[12] Unsystematic or specific risk, is the risk that is specific to a company or industry.

Motorola which supplied Israel with military equipment that was used for the attack of Gaza in 2008/2009.[13] Accordingly, institutional investors who are aware of this fact and yet are willing to invest in Motorola, are viewed as irresponsible.

As mentioned before, institutional investors have a fiduciary obligation to their beneficiaries, which is generally interpreted as the maximization of financial returns. In that view it is difficult to motivate the institutional investors to use their power to change corporate behavior on societal concerns. However, as these investors invest larger and larger amounts of capital and are more closely bonded to the companies they own, it becomes harder for them to simply walk away from their "dissatisfied" investments. This means that if institutional investors are not satisfied with the decisions a company has made, they will have to exercise pressure in order to change those decisions. They can no longer remain as disinterested parties. (Graves and Waddock, 1994:169). In this sense, investors may be interested in raising investments in socially responsible companies. Such companies are considered as showing less risky long-term behavior than less socially responsible companies. Large institutional investors can exert ownership practices to increase the value of their shareholdings.

Studies by the Social Investment Forum (SIF) have found an incredible growth of assets invested in socially responsible investing strategies. According to the SIFs report (2007) on 'SRI trends in the US', one out of every nine investment dollars managed by institutional investors or asset managers runs following socially responsible strategies, either social screening, engagement or community involvement. For the period 2003-2007, SRI assets rose with more than 25% in the US (Eurosif, 2008). While the European market for SRI has more than doubled in two years time, from €1.033 trillion in 2005 to €2.665 trillion in 2007 (Eurosif, 2008:10). The assets in Europe were primarily managed by using broad SRI strategies, which includes negative screening and engagement. The pie chart (figure 2) on the next page presents the latest figure for the global SRI market and can be estimated at roughly €5 trillion. Accordingly, Europe remains the largest market for SRI (53%), followed by the United States (39%).

[13] Students against Israeli Apartheid (2010) , Carlton University, www.carleton.saia.ca/

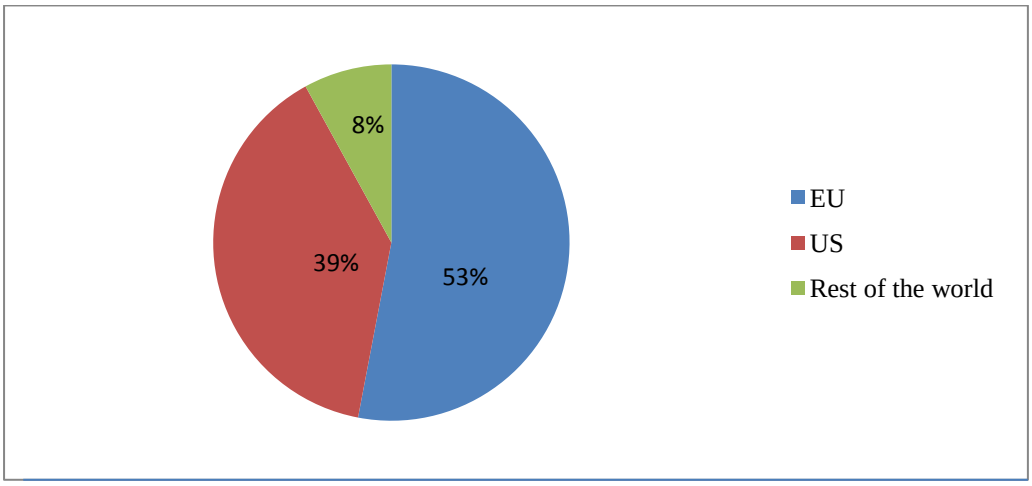

Figure 2: The global SRI market in 2008 (around €5 trillion)

Thus, the European and US markets for SRI stay dominant and are driven by institutional investors (Eurosif, 2006; SIF, 2007). Another example of the rapidly growing interest from institutional investors for socially responsible investing, are the constantly growing numbers of signatories to the Principal of Responsible Investment (PRI).[14] In 2006 the United Nations established the PRI specifically for investment management, as a framework to assist investors in their decision making process to attain better long-term financial returns and exercise ownership practices on societal concerns. The PRI has become the most important international standard with regard to socially responsible investing.

The ownership practices that institutional investors exercise to encourage socially responsible behavior is still an upcoming phenomenon. Apart from social screening, investors have become increasingly conscious of their potential to actively exert influence on corporate behavior through the use of their ownership rights. Since the early 1970s, ownership practices by shareholders were mainly passive because they adhered blindly to the *efficient markets theory* (Fama, 1970). This theory implies that capital markets are efficient where the asset price works as an exact indicator for resource allocation (Beechey et al., 2000:3). Hence, the asset price fully reflects all available information and thus acts as a controlling mechanism of corporate management. Furthermore, according to Davis and Thompson (1994:148) the passivity of ownership practices is also caused by *rational ignorance.* In this sense, rational ignorance implies that shareholders do not see the benefits of using their voting rights when their votes have no influence on corporate management due to the small shares they own. As the economy becomes more globalized and governments find it harder to regulate, the control

[14] Signatories to the PRI are classified in three groups: asset owners, investment(asset)managers and professional service partners. See www.unpri.org

institutional investors have over companies acting in a socially responsible way, becomes more important. Thus, investors follow a different rule now: 'passive ownership practices have become more active'. Investors are now proactively raising societal concerns through dialogue with the board of directors. They are filling more shareholder resolutions at Annual General Meetings and they regularly use their voting rights (Lydenberg, 2007:475). Nevertheless, the debate about the role that institutional investors have as responsible owners remains open. The final section of this paragraph is about the factors that influence the choice of being socially responsible or not.

2.2.3 Factors driving institutional investors to socially responsible investing

This study agrees with Campbell (2007) that the degree to which investors act socially responsible depends on economic conditions and some institutional factors. It will be relatively harder for investors to generate good stable financial returns in the short run, when they are operating in an economic unstable climate, where for example, consumer spending is low and inflation is high. Theoretically, in this unfavorable scenario, investors are less inclined to behave in a socially responsible manner than would otherwise be the case (Campbell, 2007:953). However, currently we are in a financial crisis and thus living in an unstable economy. In this financial crisis the outcomes of SRI could follow two different directions: either the crisis places SRI under pressure, or it emphasizes the necessity of SRI compelling investors to give more attention to social responsibility and long-term financial returns of their investments.

In this respect, the behavioral influence of the financial crisis remains to be seen, but could clearly be a significant question for additional research. Similarly, investors who have poor financial performance, are less likely to implement socially responsible investing activities, than those who have a strong financial performance. Consequently, investors who are less profitable have lesser resources to save for socially responsible activities, than those who are more profitable (Campbell, 2007:952). In addition, derived from the *slack resource theory*, enhancing financial performance generates corporate opportunities to enhance social performance (Waddock and Graves, 1997). Besides, those who have a very poor financial performance might jeopardize shareholder value and take great risks by acting in an irresponsible way to improve the financial condition of their company, only if they truly believe that they can get away with it.

Not only economic conditions are driving investors to behave in socially responsible way, but also national regulations that require more transparency and integration of social and environmental issues from the investors (Eurosif, 2006:12). At the international level, there are initiatives such as the Millennium Development Goals, the PRI and the Carbon Disclosure project, which set social and environmental goals for investors and companies (Schmidt and Weistroffer, 2010:12). Also nongovernmental organizations and the media influence investors to behave more social responsible, since they have the power to pressure and lobby them (Reneboog et al.,2008:1731).

The previous sections have reviewed the concept of socially responsible investing, as well as the role of institutional investors. From these sections, it can be concluded that there is a growing demand from institutional investors to invest socially responsible. Moreover, the phenomenon 'social investor' has become more valuable. However, it is not yet determined whether social investors are willing to sacrifice *corporate financial performance* for *corporate social performance* because social investors are expected to be less profitable. The last part of this literature review will discuss the performance trade-off and gives a scientific perspective why this study believes that social investors are less profitable.

2.3 The performance trade-off

This study tries to do research on the existence of a performance trade-off. Investors have to choose if they are willing to make less profits in exchange for *corporate social performance* (CSP). The concept of CSP in which the environmental facet is incorporated, is in this study identical to socially responsible behavior or SRI. This means that being a social investors automatically leads to being socially responsible and therefore having CSP. For this reason and because the conventional investors do not incorporate social responsible issues in their investment process, this study assumes that social investors will always have a greater CSP than their conventional counterparts. If this is the case, social investors only have to focus on *corporate financial performance (CFP),* or profitability. CFP is the management's duty to generate revenues and maintain financial health over time. Higher CFP leads to increasing wealth for the stakeholders of the company. CFP can be measured in different ways. Orliztky et al. (2003:407) distinguish three measures: market-based, accounting-based and perceptual-

based measures.[15] It would be safe to assume that the most popular measure of returns are based upon accounting earnings. This is due to the fact that the information used in corporate finance is derived mainly from accounting statements. Accordingly, this study also uses the accounting-based measure to explain CFP. Through the accounting-based measure, returns are subjected to the company's ability to allocate money efficiently and take decisions wisely. Hence, the accounting returns reflect a company's capabilities and internal efficiency rather than external responses to organizational actions. Measures such as *return on assets (ROA)* and *return on invested capital (ROIC)* are a part of this approach.

The link between CSP/SRI and CFP has been widely debated and studied (Graves and Waddock, 1994; Griffin and Mahon, 1997; Orlitzky et al., 2003). Many academics and or practitioners have asked whether the incorporation of social and environmental concerns into the process of investment decision making hurts financial returns or not. The majority of empirical SRI studies analyzing CFP of socially responsible funds against the performance of conventional funds (see, for example, Bello, 2005; Chong et al.,2006; Gezcy et al., 2005; Hamilton et al, 1993). Analysis of socially responsible funds is in part not that complicated, since data is generally readily available**.** However, these studies have the shortcoming that fund performance depends much on the skills of the fund manager. Low or high performance could be the result of poor- or superior manager skills instead of an SRI effect. A second type of study focuses on the performance of socially screened stock portfolios (Hong and Kacperczyk, 2006), which are often only based on environmental criteria. Nevertheless, social investors have a broader outlook to focus on, not only environmental criteria matter. A third type of studies uses SRI indices to explain the link between CSP and CFP (Boutin-Dufresne and Savaria, 2004; Schröder, 2003). The authors then compare conventional indices, such as the S&P 500 index with SRI indices, such as the Dow Jones Sustainability index and the FTSE4Good index. A fourth set of empirical studies uses the event study technique to evaluate the financial impact in the short run when companies engage in socially responsible or irresponsible activities (Teoh et al., 1999, Worrel et al.,1991). The last set of studies assess the link between CSP/SRI and long term CFP, using accounting or financial measures of profitability (McWilliams and Siegel, 2000; Waddock and Graves, 1997). This study follows the last method. Although it is differing from previous research, because this

[15] The market-based measure, such as the price per share, shows that the principal stakeholders are the shareholder. The perceptual-based measure uses a survey and request the respondents to give subjective estimates of, for example, the company's financial achievements relative to other companies (See Orliztky et al., 2003: 407/8)

study does not actually measure CSP. Following some criteria for being a social investor, which will be described in the next chapter, this study labels CSP/SRI as a constant variable. Hence, CSP/SRI is treated as an independent variable used to predict CFP.

Previous research has provided mixed results in analyzing this link between CSP/SRI and CFP. This is partly attributable due to the different ways CSP/SRI and CFP have been defined and measured. Based on literature review, the link between CSP/SRI and CFP could be neutral, positive or negative. Neutrality is supported by the argument that it is impossible to determine the link between CSP and CFP, due to the complexity of the environment where companies operate (Fauzi, 2009; Mahoney and Roberts, 2007). Additionally, Ullman (1985) argued that there is no rationale to foresee the existence of any link, as there are so many intervening variables between the two. In short, neutralists argue that it stays unclear whether CSP/SRI contributes to or harms CFP.

The researchers for a positive link between CSP/SRI and CFP (see figure 3) believe that investing in a socially responsible way does not have to lead to a performance sacrifice, at least not over the long run (Waddock and Graves,1997)

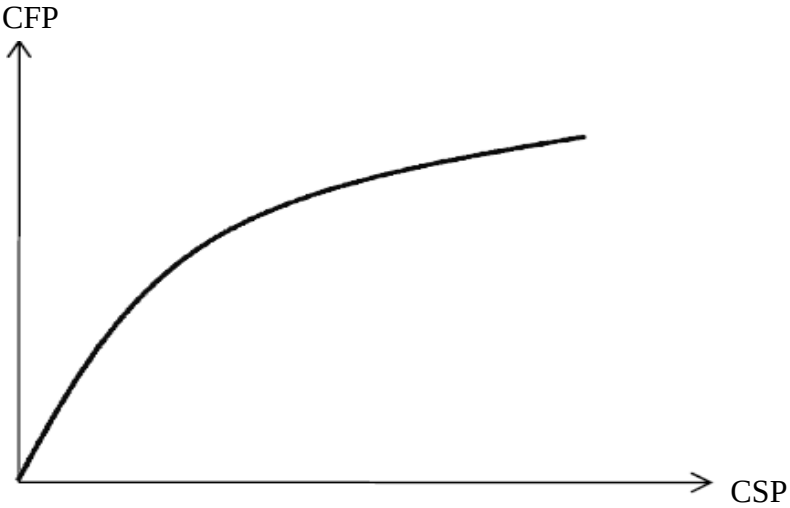

Figure 3: The positive link between corporate social performance and corporate financial performance.

This view can be explained by the following simple example. Suppose that there are four strategies for investors to choose from: strategy A generates positive CFP as well as positive CSP, while B generates positive CFP but negative CSP, such as environmental damage. C on the other hand generates negatives CFP but positive CSP and D generates both negative CFP and CSP. Obviously, both social and conventional investors will invest in strategy A, since this is the perfect sustainable situation; they can only generate positive performance, while

none of them will invest in strategy D. However, there investment behavior with regard to strategy B and C may not be similar. While conventional investors will only invest in B, social investors may consider to invest in C as they believe in 'doing good' by incorporating societal considerations into their business. The researchers supporting the positive link believe that in the long run strategy B devastates shareholder value due to, for example, the cost of lawsuits, while strategy C generates value as it may cover such costs**.** Accordingly, social investors may outperform conventional investors in the long run. The preceding example can be summarized in the figure below:

	Positive CFP	**Negative CFP (short-run)**
Positive CSP	**A.** *social* and *conventional* investors will invest (sustainability)	**C.** only *social* investors will invest
Negative CSP	**B.** only *conventional* investors will invest	**D.** neither *social* nor *conventional* investors will invest

Figure 4: The performance trade-off.

This outperformance hypothesis could be clarified by the following reasons. First, CSP is a positive indicator of good managerial skills, which will notably improve the company's profitability (Boutin-Dufresne and Savaria, 2004:59). Moreover, involving with multiple stakeholder groups and dealing with their concerns provides a sign to the capital market that managers are well skilled and therefore some argue this improves a company's value (Margolis and Walsh, 2001). Second, taking care of consumers and the society, as well as the environment decreases the exposure to certain risks and the probability of high costs due to claims, government fines and community dissatisfaction. Eluding these costs, which financial markets often tend to underrate, again makes a company more attractive to shareholders (Renneboog et al., 2008:1734). Third, if socially responsible behavior (such as, implementing social screening policies and ethical codes) is considered of value to employees, customers and suppliers, then employee relations will get better and sales will rise, which can transform into a higher corporate value (Gompers et al., 2003). Fourth, social investors have a smaller investment universe, they value more than only financial performance and thus are more watchful to pick the most profitable investment options and at the same time avoiding risk. Furthermore, social investors try to allocate their resources in a Pareto-efficient way. Finally, good relationships with stakeholder groups are required for the endurance of a company.

Socially responsible behavior is also seen as a symbol of reputation, and the company's reputation will be enhanced if actions are taken, for instance, to support the community which will result in a higher corporate value. Hence, when a company raises its cost by enhancing CSP in order to raise competitive advantages, such social responsible behavior can improve the company's reputation, thus, CFP can be enhanced in the long run, by offering up short term CFP.

According to Glac (2008:42) financial returns are important for both, social investors and conventional investors. Therefore, even investors who gain value from socially responsible investing must make an adequate rate of financial return in order to attain their overall investment objectives. This in turn means that they will have a minimum to the trade-off they can generate. The final studies report such a trade-off between CSP/SRI and CFP, as is pictured in figure 5. They believe in a negative link between CSP/SRI and CFP, which this study also relies on. SRI incurs cost by investing in "socially responsible" policies which brings these companies competitive disadvantages towards other less responsible companies (Ullmann, 1985). These competitive disadvantages occur because the company itself bears the burden of these socially responsible policies instead of shifting it to governments or individuals.

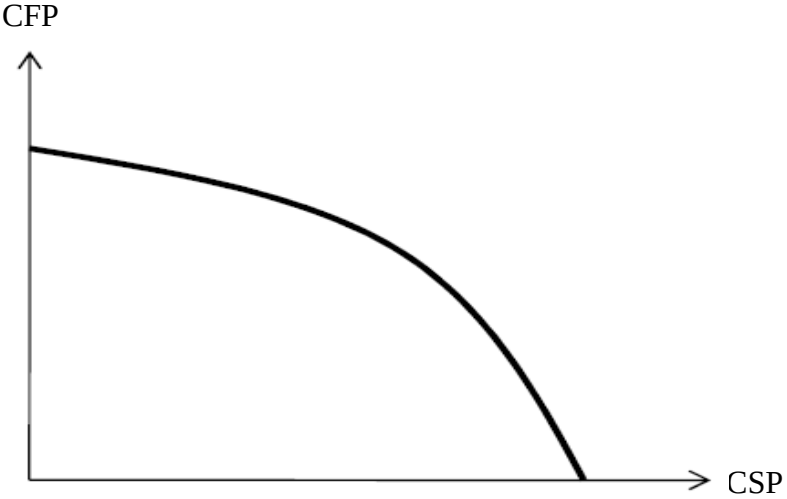

Figure 5: The negative link between corporate social performance and corporate financial performance

Neo-classical economists agree with this point. They argue that CSP causes the company to incur costs that lessen profits and shareholder value. According to Friedman (1970), CSP only generates costs without profits. He states that being socially responsible is unfavorable to companies as they not succeed to maximize CFP**.** Even if social responsible behavior may

benefit some groups of stakeholders, the companies private financial returns are negative. When neglecting some groups of stakeholders, such as the environment or customers, this may result in a poorer CSP for the company, but will improve CFP. Hence, this assumption is consistent with the negative link between CSP and CFP.

Another logic behind the negative link can be explained by using the previous example in figure 4. Look at strategies B and C, which have different investment options for social and conventional investors. If markets perfectly value the investment options, social investors are likely to generate less CFP than conventional investors. This underperformance hypothesis is clarified by the following two arguments. First of all, social investors invest less in financially attractive investment options as a consequence of the missed investment strategies like B. Second, social investors overinvest in negative CFP investment strategies like C. In this case there is no difference in short-run en long-run performance.

An additional explanation for the negative link between CSP and CFP is the belief that the application of societal concerns into the investment process must lower financial returns due to the restriction of the investment universe. Relying on modern portfolio theory, this condition declares that investment portfolios that can select 1000 companies or strategies from their investment universe will be more efficient than portfolios that can select just 500 companies or strategies. Moreover, investors investing socially responsible are not efficient in using their resources and thus will not maximize CFP. Gezcy et. al (2005) are discussing this argument in their study. They found that investors who invest in socially responsible equity funds forgo returns from this decision. Chong et al. (2006) have compared the performance of a socially responsible fund with that of a socially irresponsible fund. They have found that the irresponsible fund is better off than the socially responsibly fund. Furthermore, this means that more rigorous social screening will cause a less favorable CFP (Renneboog et al., 2007). According to Hong and Kacperczyk (2006), social norms into the investment decision making process have significant negative effects for market returns and efficiency. As is mentioned before, if it is the case that socially responsible investing lowers financial returns, than there would be a trade-off between CSP/SRI and CFP, which this study empirically analyzes in chapter 4. Before starting with the actual analysis, the next chapter describes the variables, data and methodology used in this study.

3. DATA AND METHODOLOGY

3.1 Introduction

The primary focus of this research is the tradeoff between social responsible activities of an investor and its corporate financial performance. Moreover, the central hypothesis that this study wants to empirically refute is: socially responsible investors are *less* profitable than conventional investors. Before testing the hypothesis, this chapter will discuss the data and sample selection, as well as the empirical model and the description of the associated variables used in the model. Particularly, selection criteria and the respective proxies for the variables chosen are motivated. In the last section of this chapter the estimation methods for panel data analyses are described.

3.2 Data and Sample Selection

For the performance analysis conducted in this study, annual[16]data has been collected for conventional investors and social investors with a SRI profile during the period 2000-2009. When selecting a company included in this research, some requirements have been set up as illustrated in figure 7:

Criteria	Conventional	Social (SRI)
GICS 40 – financial sector	✓	✓
Active	✓	✓
European North-American	✓	✓
Data availability		
• profitability	✓	✓
• control variables	✓	✓
Websites	✓	✓
Social screening		✓

Figure 6: Company selection criteria

[16] Except for the independent variable, which has no time subscript (see equation 2)

First of all, this study focuses on companies (institutional investors) in the financial sector. Therefore, the research started with compiling a list of companies selected on their Global Industry Classification Standard (GICS) code which was obtained from Datastream. This list consist of all companies with the GICS code 40, which is the classification for the financial sector. Furthermore, the companies were also classified by their (sub-) industry code.

Industry Classification	Frequency	%
Asset Management	41	51.3
Consumer Finance	2	2.5
Diversified & Regional Banks	3	3.8
Diversified Capital Markets	5	6.3
Investment Banking & Brokerage	10	12.5
Multi-line Insurance	1	1.3
Multi-Sector Holdings	6	7.5
Other Diversified Financial Services	5	6.3
Real Estate	7	8.8
Total	80	100

Figure 7: Sample distribution by (sub) industry

In addition, only companies which have been active during the entire time span of the research (2000-2009) have been selected. The companies have been selected this way to achieve data consistency and increase comparability of companies over the time period. Next, the criterion was to include all companies that are located in Europe and North-America. Also the information availability about the company's level of profitability (ROA and ROIC) and all control variables, was an important selection norm. When putting the list further, the next criterion was the existence of a public website. Each company's website has been examined. As seen in figure 7 all criteria, except for social screening, apply to both conventional and social investors.

As there is no comprehensive database on SRI (and certainly not for the financial sector) and due to the lack of data availability, the sample remained rather small. Initially there were 75 conventional investors and 50 social investors listed. After filtering the data for SRIs as well as missing data on financial and control variables, the sample size is restricted to 60 conventional investors and 20 social investors. For a list of the companies in the sample and their websites, see Appendix A.

The panel data set contains a total of 80*10=800 observations (including missing values). In other words, 80 companies are followed for ten years and sampled annually. However, Eviews automatically correct for the missing values which is still included in the panel data set and therefore the number of observations will not be more then 650.

3.3 Empirical model

To test the hypothesis this study employs panel data analysis using various least squares (LS) estimators. The basic econometric model examined is:

$$CFP_{it} = \alpha_i + \beta_1 SRI_i + \sum_{j=1}^{5} \gamma_j CONTROL_{itj} + \varepsilon_{it} \qquad (1)$$

where, CFP denotes corporate financial performance, SRI denotes whether an institutional investor is a socially responsible investor or not, CONTROL represents five different control variables, β_1 and γ_j are regression coefficients, α is the intercept (or the general mean), ε is the error term, which has two dimensions one for cross-section *i* and one for time-series *t*. Accordingly, the subscripts indicate institutional investor (*i)* and time *(t).*

If the regression coefficient β_1 in equation (1) is *significantly* different from zero, it could be concluded that being socially responsible matters, either positively or negatively. In the former case it would mean that investing in a social responsible way will lead to improved financial performance. In addition, a positive significant sign means that there is no trade-off between CSP and CFP, since both have improved and therefore the central hypothesis will be rejected. The latter case points out that there is a trade-off, since SRI causes a diminution in CFP. However, when β_1 is equal to zero, it means that the ability to predict the dependent variable for any value of the independent variable is also zero. In other words, SRI/CSP does not affect CFP. Finally, if β_1 is *insignificantly* different from zero, the conclusion is that it does not matter from the point of view of financial performance whether or not to invest in a socially responsible way. If this is the case, predictions should not be made by using this model.

As seen in equation (1) the dependant or observed variable in this research is corporate financial performance. The independent or explanatory variable, which is of primary focus and may explain the dependant variable – corporate financial performance – is SRI, a proxy

for the socially responsible behavior of institutional investor *i* (the information if an investors is socially responsible). Since size, risk, sales and company age have been suggested in earlier studies to be characteristics that influence a company's financial performance (Waddock and Graves, 1997), each of these characteristics are included as control variables. Accordingly, equation (2) gives all the variables that are estimated in equation (1)

$$CFP_{it} = f(\underset{+/-}{SRI_i}, \underset{+}{SIZE_{it}}, \underset{-}{RISK_{it}}, \underset{+}{SALES_{it}}, \underset{+}{AGE_i}) \qquad (2)$$

where,

CFP_{it} is the long-run corporate financial performance of institutional investor *i* in year *t*

SRI_i is a proxy for the socially responsible behavior of institutional investor *i*

$SIZE_{it}$ is a proxy for the size of institutional investor *i* in year *t*

$RISK_{it}$ is a proxy for the risk of institutional investor *i* in year *t*

$SALES_{it}$ is a proxy for the sales growth of institutional investor *i* in year *t*

AGE_i is the age or founded year of institutional investor *i*

The signs (+/-) below the variables in equation (2) represent the relation of each variable with the dependant variable CFP. As mentioned before SRI is either positively, negatively or has no relation with CFP. SIZE, SALES and AGE are expected to be positively related to CFP while RISK may be negatively related to CFP.

3.4 Variable Description

This section gives a short discussion of the measurement of variables and their justification in estimating CFP. For most variables this study uses proxies that have also been used in previous studies (McWilliams and Siegel, 2000; Waddock and Graves, 1997) in order to provide a basis for comparing results obtained.

3.4.1 Dependent variable: Corporate Financial Performance (CFP)

The corporate financial performance of an investor is based on the level of profitability. The level of profitability is measured through the use of accounting-based variables: return on assets (ROA) and return on invested capital (ROIC). ROA and ROIC are financial ratios, which present financial information extracted from the balance sheet or/and income statement and illustrate the relationship between two absolute measures of profitability. Ratios rather

than absolute financial variables are widely used for the comparison of financial results within an specific industry by researchers as well as investors and other financial institutions (Aupperle et al., 1985; Mahoney and Roberts, 2007; Yang et al, 2010; Waddock and Graves,1997). ROA and ROIC were used separately to determine a company's CFP. Both financial ratios represent a company's internal efficiency (Cochran and Wood, 1984).

Return on assets is calculated as net operating income after tax divided by total assets. It indicates the return a company is able to generate relative to its total asset base. Although ROA is a good measure to compare companies within the same industry, which this study complies to, ROA does not consider which assets are really employed in generating profit and which are additional (Damodaran, 2007). Conversely, return on invested capital can solve this problem. It includes solely assets and liabilities that are employed in generating operating earnings and eliminates the additional. Return on invested capital, or in short, return on capital is calculated as the after-tax operating income[17] for the year *t* divided by the book value of the average invested capital[18] during the year *t.* It tries to estimate the returns earned on all capital invested in the existing assets of a company as a starting point in evaluating the quality of investments it has already made. Both measures are in percentages. Data on ROA and ROIC were derived from Datastream database provided by Thomson Financial

3.4.2 Independent variable: Socially Responsible Investing (Investors)

As pointed out before in the literature review, SRI does not have a common language, therefore it remains difficult to evaluate. The same counts for CSP, which is a complex multidimensional concept, within which behaviors vary across an extensive range of inputs (e.g., social screening or engagement) and outputs (e.g. community involvement) (Aupperle et al., 1985). In this study the two concepts are strongly related to each other. Meaning that, if socially responsible investing is practiced or in other words being a social investor, will automatically lead to CSP. So, in fact, this study does not really measure CSP as all previous studies have tried to do when investigating the link between CSP and CFP (McWilliams and Siegel, 2007; Orlitzky et al.,2003; Waddock and Graves, 1997), but it takes CSP as a constant variable. Starting from the point where social investors always generate a higher CSP than their conventional counterparts, this study tries to find out if a trade-off between CSP and

[17] After-tax operating income= Net income before preferred dividends + Interest expenses (1 - tax rate) – Non-operating income (1 –tax rate)

[18] Invested capital= Fixed assets+ Current assets – Current liabilities - Cash

CFP exists. Thus, the independent variable represents social responsible investing or being a social investor. Basically, now the question is how to measure SRI?

Previous studies have used different methods to measure social responsible behavior. Many researchers draw on the social and environmental ratings database assembled by the KLD[19] (Mahoney and Roberts, 2007; McWilliams and Siegel, 2001; Waddock and Graves, 1997). KLD rates companies on different dimensions such as, climate change, charitable giving and controversial business involvement, considered to be significant for CSP. While some appear to use mutual fund screens to select their social responsible investments (Geczy et al., 2005; Schröder, 2004), others create their own instruments and use additional proxies of social responsibility as fits their research needs. Hence, the selection of indicators to capture the level of social behavior is not without a certain degree of subjectivity. In this study SRI is taken as a proxy for the social responsible behavior of an institutional investor. Many of these social investors use social screens, engagement and/or community involvement to put socially responsible behavior into practice. In this context, SRI is defined as a (0,1) variable; an institutional investor is either socially responsible or not, based on the practice applied. In other words, SRI is a dummy variable, with a value of 1 if an investor is socially responsible and 0 otherwise. For example, an investor that avoids investments in nuclear power companies, has recycling and pollution policies, helps less fortune people with financial services and gives donations to charity, is socially responsible.

According to Sen and Bhattacharya (2001), there are various fields in which social investors show responsible behavior. Since many researchers have derived data from the KLD, it seems as if the fields incorporated in this database have proven themselves to be convenient indicators for social responsibility. These fields are as follows:[20]

- *Environmental field* (e.g., clean energy, renewable technologies, recycling and pollution prevention)
- *Social field* (e.g., community involvement, diversity, employee relation and human rights)
- *Governance field* (e.g., dialogue, shareholder activism and public policy)
- *The field of controversial businesses involvement avoidance* (e.g., avoiding business involved in pornography, alcohol, tobacco, nuclear power, military ect.)

[19] Kinder, Lydenberg, Domini Research & Analytics Inc. (KLD) is a financial advisory company specializing in ESG issues and the assessment of CSP. See, www.kld.com

[20] The list with socially responsible indicators is taken from KLD: www.kld.com/research/ratings_indicators.html

The KLD database distinguishes 'strengths' and 'concerns' ratings, these are positive and negative indicators, which are subtracted from each other (strengths – concerns) to create a composite CSP score or a social responsibility level. However, the indicators used in this study only exhibits strengths and not concerns, since the use of ratings is out of the question here.

In fact, the above KLD fields are only used to scrutinize which fields correspond with the activities that the investors actually practice. Basically, these activities are more or less equivalent to the implementation of SRI strategies, as discussed earlier in the last section of chapter 2. The necessary condition to determine whether an institutional investor actually is a social investor, is the implementation of one of the strategies, namely social screening. This study makes no distinction between the three social screening techniques (negative, positive and best-in-class), since this is often difficult to trace. Nevertheless, this study categorizes four approaches for social screening:

- *ESG screening*
- *Ethical screening*
- *Green investing (environmental field)*
- *Sustainability investing*

ESG screening excludes or includes investments based on their environmental, social or governance practices. *Ethical screening* is norm based exclusion of investments that do not meet specific criteria, such as sectors or industries which are involved in animal testing, pornography, weapons, nuclear activities, tobacco and alcohol ect. (controversial business involvement). *Green investing* focuses on investments in companies and technologies that are considered to be positive for the environment. This includes companies that are offering renewable and clean energy solutions (solar or wind power), as well as individual companies that are environmentally-friendly by improving their operational activities. *Sustainability investing* represents investments in 'responsible' businesses (e.g. healthcare, education, recycling, etc.) or in best-in class companies. Appendix B shows a list with social investors and their corresponding SRI approaches.

Furthermore, when searching for social investors, this study also examines whether the investors are active in the area of engagement and community involvement (the other two SRI strategies). However, this is not a requirement for selecting social investors. Such SRI

data has been collected from publicly available information on institutional investors' websites as well as from their social/sustainability reports. This study also explores environmental policies and code of conducts (corporate governance code) if available, in order to give a more complete impression of SRI's. It is important to note that there is a limitation by using this approach, since the information is based on secondary data. Moreover, it must be kept in mind that a secondary data source presents information that may have been composed for different reasons. Therefore, the institutional investors' websites used in this study may have been prepared to impress and persuade clients. Accordingly, this means that the data could be either biased or exaggerated. Hence, this study cannot guarantee that the information on their websites is truly objective and that they are generating their revenues only by investing in a socially responsible way. So the conclusion drawn in this study must be interpreted with the limitation in mind**.** However, this study will give some valuable insights for further research into the overall question of whether or not institutional investors are better or worse off by investing in a socially responsible way.

3.4.3 Control variables

Any model that intends to clarify a company's financial performance must also give attention to the variety of factors that contribute to it. Therefore, studies that research the contribution of CSP must control for a range of other additional factors. Omitting these factors, could mean that the relation between CSP and CFP is biased. (Margolis and Walsh, 2001). This study uses a number of control variables which are also applied in prior research and are consistently shown to be related to CFP (Aupperle et al., 1985; Choi et al., 2010; Mahoney and Roberts, 2007; Waddock and Graves, 1997). These control variables which are all company characteristics and may affect CFP include size, risk, sales growth and company age. Company size has been shown to affect CFP (Baumol, 1967; Orlitzky, 2001; Tipuric, 2002), thus controlling for size may be relevant. Larger companies are assumed to be relatively more efficient than smaller ones, which positions company size as a source of competitive advantage. In addition, size provides the resources to ensure companies stability over time, for instance, by the attraction and retention of more skilled laborers. Larger companies also have more market power and therefore have greater control to influence (external) stakeholder groups. For all these reasons, it is understandable to expect a positive relation between company size and CFP. After identifying the most general measures of size, the logarithm of total assets and market capitalization(end-year) were used to control for

company size. Total assets represent the total assets of the company converted to $US using the fiscal year end exchange rate. End-year market capitalization represents the total market value of the company converted to $US using the fiscal year end exchange rate.

As a proxy for the riskiness of a company, the debt ratio is used, which is calculated by dividing total debt with total assets multiplied by 100 (Mahoney and Roberts, 2007; Waddock and Graves, 1997). A low debt ratio implies that a company can continue to meet its debt obligations. On the other hand, high debt ratios, such as 160%, refers to a company that is under pressure to meet its obligations and have more difficulty to sustain over time. However, more riskiness and thus a higher debt level increases average returns to owners while at the same time increasing the likelihood of financial problems. In short, this study hypothesizes a negative relation between a company's risk and CFP. The next control variable is the rate of market growth, which is measured by sales growth. Sales growth is the increase in the total operating revenues (net sales) of a company over a specific period of time. In addition, sales growth for the current year *t* is measured by net sales in year *t* (current year) minus the net sales in year *t-1* divided by net sales of year *t-1* (last year) multiplied by 100. Thus, this number is in percentages. When market demand and sales volumes raise, it is easier for companies to acquire clients and keep them satisfied, which drives revenues and thus, profits. In addition, this study hypothesizes a positive relationship between the rate of growth and the company's CFP.

Company age is another control variable, which is taken as a linear variable. It is approximated by the number of years a company exists, taking the founded year as the base year and the end year of the sample period (2009) as the last years. It seems plausible that companies which have a longer existence are more experienced and well-managed than companies that are new. In addition, matured companies which have the ability to sustain its competitive advantage over time and are able to eliminate competition are often innovative and therefore generating higher returns. In this case the age of a company is expected to be positively related to CFP. Thus the control variables are SIZE1= total assets in US$, SIZE2= market cap in US$, RISK= (total debt/total assets)*100, GROWTH= (net sales [*t*] - net sales [*t-1*]) / net sales[*t-1*] *100, AGE= (year 2000-founded year, year 2001-founded year, ect.). All data on the control variables are obtained from Datastream database provided by Thomson Financial.

3.5 Panel data analysis: estimation methods

In most prior studies the link between social and financial performance has been examined by the use of cross-section (Fauzi, 2009; Fu-Ju Yang et al., 2010) or panel data analysis (Mahoney and Roberts, 2007). Since the data set in this study consists of time-series (2000-2009) observations on a set of cross-sectional units (individual companies), panel data analysis is used. In general, the same cross-sectional units are observed over time. Panel data may provide a solution to the problem of unobserved heterogeneity, while the regression results of many cross-sectional studies suffer from this problem and therefore are often disputable (Dougherty, 2006:408). The extensiveness of the panel data set allows a number of different specifications and estimation methods. Additionally, the proper specifications and estimation methods are determined by the configuration of the intercept (α), the regression coefficients (β) and the assumption regarding the error term (ε) (Westbrook, 2002:4). This study believes that the analysis of different specifications and estimation methods which provide the same outcomes strengthens the overall results. The specifications and estimation methods applied in this study is described below.

3.5.1. Pooled OLS

The first estimation method is the pooled ordinary least squares (OLS). This method simply pools the data whereby a single OLS regression is estimated for all cross-sectional units over all time periods. However, pooled OLS is only efficient if all cross-sectional units (companies) are considered to be the same, so that there will be no relevant cross-section specific unobservable effects (a_i). In other words, this means that all cross-sectional units share the same intercepts (α) and regression coefficients (β). Additionally, this method is based on the classical assumption that the errors (ε) have to be independent (uncorrelated: no serial correlation) of one another and identically distributed (homoskedastic). Under these conditions, OLS gives the best linear unbiased estimator (BLUE).[21] A standard pooled OLS specification is:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + \varepsilon_{it} \qquad (3)$$

[21] "Best" means that OLS gives the most unbiased and efficient estimates of the regression coefficients. Efficiency in this case represents the size of the standard error; it should not be to large or to small

where Y_{it} is the dependent variable, X_{it} is a vector of independent variables, α is the intercept and ε_{it} is the error term. However, if a_i is correlated with any of k independent variables, the regression estimations of Y on X will suffer from unobserved heterogeneity bias. Even if this is not the case, the presence of an unobserved effect might cause OLS estimations to be inefficient and invalidated (Dougherty, 2006:411).[22]

The preceding shows that this model is very restricted. Besides, the assumption that all cross-sectional units (in this study all individual companies) share the same intercepts is not likely. Additionally, it is unrealistic to expect that the error terms are uncorrelated (independent) across both companies (cross-sectional units) and years (time periods) in this panel. Therefore, alternative specifications are applied to overcome these difficulties. However, the pooled OLS will still be estimated and used as a benchmark against the estimations of fixed and random effects regressions, which are considered to be more suitable for analyzing panel data.

3.5.2. One-way fixed effects

There are three basic techniques for the fixed effects model; within-groups, first-differences and least square dummy variables (LSDV). The first two eliminate the unobserved fixed effects from their models, while the third explicitly brings this unobserved effect into the model.[23] This study is estimating all regressions with Eviews. Eviews only uses the LSDV technique so that the fixed effects method is described as follows.

The model for estimating the fixed cross-sectional effects could be:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + a_i A_i + \varepsilon_{it} \qquad (4)$$

In this equation the parameters a_i and A_i are added compared to equation (3). The first a_i represents the unobserved fixed cross-sectional specific effect, which is now explicitly brought into the model. The second is a set of dummy variables, where A_i is equal to 1 if an observation is relating to cross-sectional unit i and zero otherwise. In fact, the unobserved fixed cross-sectional specific effect is being treated as the coefficient of the cross-sectional specific dummy variable; the a_iA_i. parameter refers to a fixed effect on the dependent variable Y_i for cross-sectional-unit i. In this case the model can be estimated by OLS or generalized

[22] So panel data alone do not solve the problem of unobserved heterogeneity, however compared to the cross-sectional OLS the unobserved heterogeneity bias is lower in the case of the pooled OLS (Brüderl, 2005)

[23] It can be mathematically shown that the first and the third estimators are the same and therefore yield the similar estimates. The only clear distinction is in the number of degrees of freedom (Dougherty, 2006: 412-416)

least squares (GLS). In addition, one may also include fixed period specific effects in an equivalent way.[24] Nevertheless, for this research period specific effects have not been included since all regressors would have to differ across individual companies (investors). While the previous model showed that pooling the data ignores the fact that the data is derived from different cross-sectional units (in this case companies), this method assumes that each cross-sectional unit has a different intercept (Dougherty, 2006: 414).

However, a major shortcoming of this method is that time-constant variables will be eliminated from the model. For example, the independent variable SRI, which is the main variable of interest in this study, does not change over time since it is a dummy variable. Hence, for each cross-sectional unit the deviations in SRI in year t from the mean for that cross-sectional unit is zero, therefore estimating regression coefficients on time-constant independent variables is not possible in this model. However, this problem could be resolved by using the IF condition in Eviews. In this case two regressions are made, one *if* SRI=1 and one *if* SRI=0, so that the time-constant independent variable is taken out of the regression and the fixed effects method is still employed.

3.5.3. One-way random effects

In the previous section it became clear that the fixed effect method is not very effective when the variables of interest are time-constant. The random effects method on the other hand offers the technical advantage that time-constant independent variables can be included in the model and be efficiently used (Kunst, 2009:6).

The model for estimating the random cross-sectional effects could be:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + v_{it} \qquad (5)$$

Where, v_{it} is the composite error term decomposed as $v_{it} = a_i + \varepsilon_{it.,}$ which implies that the unobserved random effects are now a part of the error term $v_{it.}$ Since unobserved heterogeneity is a part of the error term, observations over time are correlated for the same cross-sectional unit *i*. Estimating the coefficients α and β in this case can also be done by

24 This study deals with an one-way fixed (random) effects specification, which only takes into account one fixed (random) specific effect, period or cross-section. If period and cross-section effects were both taken into account, the specification would be a two-way fixed (random) effect model. However, the two-way random effects can only be estimated in Eviews if the data are balanced meaning that every cross-section has the same set of observations. In this case, the panel is unbalanced since observations are missing and thus it is not possible to estimate a two-way random effects specification. A two-way fixed effects is possible, but irrelevant.

OLS, however this estimator is not the best linear unbiased estimator (BLUE) since the error terms v_{it} are cross correlated. An efficient estimator can be achieved by GLS. In Pooled OLS, the GLS correction is not applied. The random effects specification assumes that cross-sectional units have different intercepts that are realizations of a random variable (Westbrook, 2002:4). Most importantly, the random effects specification assumes that the cross-sectional specific random effects ($a_{i)}$ are uncorrelated with any of *k* independent variables (Quantitative Micro Software, 2006:498). Comparing the fixed and random effects estimates can be a test for whether there is correlation between the a_i and X_{it}, assuming that the errors and the independent variables are uncorrelated across all time periods.

3.5.4 White robust standard errors

As mentioned before, error terms have to be uncorrelated and identically distributed (homoskedastic).[25] However these assumptions are often violated in panel data analysis. This might cause standard errors to be biased and thus give invalidated results. However, *robust standard errors* deal with this problem of errors that are not identically distributed nor uncorrelated across cross-sections. Therefore, when these problems are likely to exist, which this study assumes, robust standard errors tend to be reliable.[26] White's robust standard errors allow for possible cross-sectional different error variances in each cross-section (heteroskedasticity) as well as contemporaneous correlation[27] among cross-sectional units. All regression results in this study are based on robust (White, 1980) standard errors. (Quantitative Micro Software, 2006, 505-507, for more details).

The next chapter discusses the empirical results.

[25] Errors should be identically distributed, this means that the variance of the error term has to be constant and the same for all observations. If the errors for the different cross-sections have differing variances, then there is heteroskedasticity.
[26] Employing robust standard errors will not change the regression coefficient estimates, but it will change the standard errors
[27] Contemporaneous correlation means that observations from a certain cross-sectional unit may be correlated with the observations from other cross-section units during the same time period. In other words, the errors might be contemporaneously correlated across companies (Podestá, 2002)

4. DISCUSSION OF EMPIRICAL RESULTS

4.1 Introduction

This chapter reports the empirical results from the regression analysis in equation (1) (see, section 3.3). The results are presented for the different specifications. The pooled OLS and random effects specification presents estimation results for the whole sample. Furthermore, the random effects specification also shows different results for two periods, namely before and during the financial crisis. The fixed-effects model splits the sample (SRI and NON-SRI) using the IF condition in Eviews. All regression results in this section are based on (White, 1980) consistent standard errors. Before actually starting with the regression analysis, the following section provides descriptive statistics and correlation analysis. In this chapter, all tables containing descriptive statistics, correlation analysis and estimation results are given in Appendix C.

4.2 Descriptive statistics and correlation analysis

Table 1 provides the descriptive statistics for all variables used in this study in each year from 2000 to 2009 as well as for the total panel period. The table shows that average ROA and ROIC are respectively, 5.3% and 8.2% for the total panel period. In 2008 the average CFP measures are negative, which could be explained by the financial crisis. SRI does not change over time, because it is a dummy variable. It only takes a value of 0 or 1. Concerning the size of the sample both small and big companies are included, since SIZE1 (total assets) varies from 0,2 to 770.976 million US$. Furthermore, SIZE2 (market cap) varies from 0,3 to 41.298 million US$. RISK has an average of 15.9%, for the total panel period which indicates that the average company in the panel is a low risk company. GROWTH has an average for the total panel period of 153%. The average overall AGE of the companies is approximately 40 years.

[Place Table 1 about here]

Table 2 provides the correlation matrix for all the variables used in this study based on the total panel period. Correlation coefficients can range from -1.00 to +1.00, which represents perfect negative and positive correlation, respectively. As expected, the two CFP measures (ROA en ROIC) are highly correlated with each other, as are both company size measures.

Due to the high correlation of the variables SIZE1 and SIZE2, this study does not implement both variables in one model. Since high correlation between explanatory variables can bias the regression,[28] SIZE1 and SIZE2 are estimated separately. More importantly, SRI and the two CFP measures show significant negative correlation, however the correlation coefficients are rather small, -0.16 for ROA and -0.15 for ROIC. In addition, there is a significant positive relationship between SRI and both size measures as well as for RISK and AGE. The company size measures, GROWTH and AGE do not significantly vary with the CFP measures, while RISK has a significant negative correlation with the CFP measures. Finally, the company size is also highly positively correlated with the age of the company.

[Place Table 2 about here]

4.3 Regression analysis

4.3.1 Pooled OLS regression

Table 3 summarizes the regression results of the pooled OLS specification. In all models CFP is the dependent variable measured by ROA or ROIC and SRI is the independent variable. [29] The coefficient of C is the intercept in the regression. This coefficient is the base level of the estimation when all other explanatory variables are zero. The size of the regression coefficient for each explanatory variable gives the size of the effect that the variable is having on CFP. Additionally, the sign of the coefficient indicates the direction of this effect (positive or negative). As can be seen in table 3, the variable of interest, i.e., SRI is statistically significant and negatively related to the CFP measures in all eight models ($p < 0{,}01$).[30] However, the influence of SRI on ROA and ROIC in these models is relatively low due to small coefficient of the R^2, which indicates the explanation capability of the variables.[31] Nevertheless, the regression results still support the underperformance hypothesis, and thus the central hypothesis H1 of this study, that social investors underperform financially in

[28] This problem is referred as collinearity. (Andren, 2007)
[29] Note that the number of observations (NT) in each model is different. This is because Eviews automatically adjusts for missing values in the data in every regression (Quantitative Micro Software (2006: 554).
[30] Since the independent variable SRI is a dummy, which only takes the value of 0 or 1, the relationship between SRI and the (absolute) value of the dependent variables should be interpreted as a relationship that does not changes over time. For this variable, a one-unit increase means changing from a social responsible investor (SRI) to a conventional investor (Non-SRI).
[31] On the other hand, this study labels the R^2 coefficient as less important since this study is simply interested in parameter estimates focusing on the coefficient of the SRI dummy.

comparison to conventional investors. Regarding the control variables, models 1 to 4 include all control variables: size, risk, growth and company age. Eliminating the less significant control variable in each of these models, which is GROWTH, results in models 5 to 8. [32] With respect to size, SIZE2 exerts significantly positive influence on ROA and ROIC in all models were SIZE2 is included (models 2, 4, 6 and 8), while SIZE1 does not seem to have any effect on both CFP measures (models 1, 3, 5, 7). This is in accordance with Fauzi (2009) who found that total assets does not affect ROA. Seemingly, it appears that SIZE2 is a better size measure with significant coefficients in all models. RISK is significant inversely related to CFP in all cases, as expected and this implies that an increase in the riskiness of a company, will decrease CFP. In addition, this is also consistent with the findings of Waddock and Graves (1997), though they used a 1-year lag for CFP. Variations in GROWTH does not seem to affect CFP at all. AGE is statistically significant, but only in the models were ROIC is the dependent variable. However, it seems that the coefficient of AGE appears to have the 'wrong' sign, suggesting that older companies (companies that exist longer, and therefore have a bigger value for company age) will, all else equal, reduce CFP. Perhaps, this could be explained by the fact that older (established) companies tend to stagnate on innovations or R&D practices in relation with the growth of their market share, due to the lack of competiveness. Moreover, when the market acquires more (new) entrants they will be too late to innovate and their customers will go to their competitors. This could lead to a decreased market share with lesser profits as a result.

[Place Table 3 about here]

In summary, in model 1 variations in SIZE1, GROWTH and AGE do not seem to affect ROA. In model 3 variations in SIZE1, GROWTH and AGE do not seem to affect ROIC. However, if SIZE1, GROWTH and AGE are correlated with one another, the individual t-tests (values in parentheses in table 3) could be misled into understating the actual significance of each of these variables. Table 2 has already displayed that SIZE1 and AGE are positively correlated. However, to test whether these variables have no explanatory power in the models, performing a joint significance test (by using the Wald test) is useful, which is illustrated in table 4.

[32] Including insignificant variables in the regression still results in unbiased estimators of the regression coefficients, but it causes the minimum variances to be larger than they would be otherwise. Insignificant variables are removed one-by-one (stepwise backwards elimination) due to the effect of elimination on the variances of the remaining variables

[Place Table 4 about here]

The restriction for the Wald test in models 1 and 3 are C(3)=0, C(5)=0 and C(6) =0.[33] If the null hypothesis holds, which is the case in both models since the p-values (prob.) are larger than the significance level of 5%, then the variables are jointly insignificant. This implies that SIZE1 and GROWTH nor AGE have statistically significant effects on ROA or ROIC, which often justifies eliminating these variables from the regression model.

In models 6 and 8 all coefficients are significant after eliminating GROWTH from models 2 and 4. However, in models 5 and 7 SIZE1 and AGE still do not seem to affect CFP. Moreover, the significance of SIZE1 and AGE in models 5 and 7 after removing GROWTH has not improved and the value of the coefficient of SIZE1 in these models (0.00000404 and 0.00000829) is negligible. For this reason and because of the joint insignificance of the variables SIZE1, GROWTH and AGE, this study considers the models 6 and 8 with SIZE2 instead of SIZE1 as size measure and without GROWTH, to be more appropriate.

Lastly, Table 3 reports the Durban-Watson statistics (DW). This is a test statistic to identify the occurrence of serial correlation in the errors of the regression. Serial correlation basically means that the errors might be correlated over time. The value of the DW[34] statistics in all models is very low, which could indicate the presence of positive serial correlation in the errors of the estimated regression. Consequently, this could lead to inefficient results (OLS is no longer BLUE), if not corrected. Since, this study only uses White's (cross-section) robust standard errors, which does not correct for serial correlation, it is necessary to deal with it. Given that the most common type of serial correlation is the first-order serial correlation, this study controls for it by allowing first-order autoregressive errors (AR(1)) in the pooled OLS specification. First-order serial correlation is referred to the fact that the errors in year *t* are directly correlated with the errors in the next time period (Andren, 2007:107). The pooled OLS specification with the AR(1) errors is shown in table 5.

[Place Table 5 about here]

[33] Assuming that in models 1 and 3 SIZE1, GROWTH and AGE are the third, fifth and sixed variables in the list under 'independent and control variables' in the regression, respectively.

[34] The value of the DW lies between 0 and 4. If there is no serial correlation (first-order) the value of DW is approximately 2 If the DW statistics falls below 2 there is evidence of positive serial correlation. If the value of DW lies between 2 and 4, there is negative serial correlation. Small values of DW (DW<1) point out that it will lead to incorrect estimates of the standard errors (positive serial correlation: standard errors may be unbiased and too small)

The AR(1) includes the errors from the past observation into the regression model for the current observation. As can be seen from the table, the estimated first-order regressive coefficient of the error terms is included for the models 6 and 8. The overall outcome is that the DW statistics have improved enormously in the regressions with the AR(1) errors. For instance, the DW statistic in model 6 before inserting the AR(1) errors indicate the presence of positive autocorrelation with the value of 0.8320. After including the AR(1) errors, the DW statistic rose to 2.2029, which more or less indicates the disappearance of serial correlation.[35] It also seems that the R^2 coefficients of the two models have been improved, which may indicate a better fit. In addition, it is important to mention that SRI is still negative and significant, although the effect that SRI has on CFP is slightly lower in this case. But it is consistent with the expectations as is explained above. As for the control variables only size is significant in this model.

4.3.2. One-way Fixed effects specification

Table 6 reports the regression results for the cross-section fixed effects method. As noted in section 3.5.2, it is not possible to include variables that do not vary across time in the fixed effects regression. The variable SRI is a dummy variable and thus time-invariant. Since, SRI is the variable of interest it would not make any sense to exclude this variable entirely. However, to still be able to apply the fixed effects and to test this variable, the IF condition in Eviews is used. This condition splits (panel cross-sections) the sample; if SRI =1 and if SRI = 0 (conventional investors), so that SRI is still included, but not explicitly in the regression. The control variable AGE has also been eliminated from the regression, since for each company the deviations in AGE in year *t* from the mean for that company is constant.

[Place Table 6 about here]

Hereafter, the result will be analyzed. First of all, the table shows that the coefficients of the intercept are significant and positive. This implies that, if all other independent variables are zero, a social investor has a ROA ratio of 7,7% and a ROIC ratio of 10,1%. For conventional investors, these ratios are 10,5% and 12,4%, respectively. In this respect, it means that social investors are likely to generate less CFP than conventional investors, supporting the underperformance hypothesis, and thus for the fixed effects specification the H1 holds.

[35] For a further discussion of the (first-order) auto-regressive model in Eviews this study refers to Quantitative Micro Software, 2006: 63-65.

Additionally, it has the same outcome as the pooled OLS, which also support the fact that social investors are less profitable than their conventional counterparts. A logical explanation could be that social investors invest less in financially attractive investment options and therefore will not maximize CFP. This also in line with Gezcy et. al (2005). With regard to SIZE2, the coefficients are only significant for conventional investors. The coefficient values for both are positive, meaning that larger institutional investors obtain higher profits. However, these values are negligible (0.0000216 and 0.00000268) and insignificant for SRIs. Furthermore, the results indicate that the relationship between RISK and CFP is still significant and negative. The coefficient values of GROWTH are not significant, for both social and conventional investors, which implies that GROWTH does not affect CFP. However, the coefficients reach a rather high t-statistics for conventional investors, compared to the t-statistics in the pooled OLS estimation. The insignificant relationship between GROWTH and CFP is in line with the findings of Guney and Schilke (2010). Looking at the coefficient of the R^2 it is improved compared to the R^2 of the pooled OLS regression (table 4), but it is approximately the same as in the pooled OLS with the correction for serial correlation (table 5). In this fixed effects estimation serial correlation does not seem to be a major problem, since the DW statistics in all cases is larger than 1, but the chance still exists that the errors are positively correlated. Therefore, lagging (1-year lag) the dependent variables is an option to reduce (positive) serial correlation even more. Not only might lagging, control for serial correlation, it also could allow independent variables to have effects that extend beyond the current period. Table 7 shows the results where the lagged dependent variables are added to the list of the independent variables.

[Place Table 7 about here]

When comparing table 7 with table 6, it can be concluded that in table 7 the number of observations in all models reduced. This can be explained by the fact that, when adding a lagged dependent variable, one observation per cross-sectional unit is lost. As anticipated, the DW-statistic has further improved in all models, which implies that serial correlation apparently is out of the question. Note that the lagged dependent variable ROIC(-1) is significant at 1% level for social investors as well as for conventional investors. This means that the financial performance in the previous period could affect the financial performance of the current period. Obviously, because the more profits you have in the previous period the more resources can be used for investment purposes in the current period. However, when using ROA as the CFP measure, the lagged ROA variable has only a significant effect on the

current ROA of the social investors. Furthermore, the relationship between SIZE2 and CFP is exactly the same as in table 6. RISK, however, is only significant for the case of conventional investors.

4.3.2. One-way Random effects specification

Table 7 shows the regression results when using the random cross-section (one-way) effects specification. The first difference compared to the fixed effects specification is that the time-constant variables have returned in the regressions and are estimated. In models 1 and 2 all control variables are incorporated. These two models are comparable to models 2 and 4 of the pooled OLS regression estimations. However, model 3 is slightly different from models 6 and 8 (pooled OLS), since the first model removed AGE as the less significant variable, while the last two models removed GROWTH. Nevertheless, the results using the random effects specification seem not to be very different from the pooled OLS estimations.

[Place Table 8 about here]

Firstly, the direction of the estimated coefficients are the same. Likewise, the values (size) of the coefficients are almost similar, since there is no large divergence. The coefficient values of the intercept are slightly higher than in the pooled OLS estimation and fixed effects model. Once more, the findings prove that there is evidence for the underperformance hypothesis due to the significant negative relationship between SRI and CFP. This supports the argument that institutional investors are better off by not investing socially responsible due to the negative effect it might have on their financial performance. However, the R^2 coefficients in this model are much lower than in the fixed effects specification. In addition, the random effects R^2 coefficients are the lowest so far. Mahoney and Roberts (2007) who also used panel data analysis with random effects specification, to explain the effect of CSP on ROA, found the same low R^2 coefficients in their models. Regarding to control variables, SIZE2 is statistically significant at 5% level in models 1 and 3. In models 2 and 4 SIZE2 is significant at 1% level. The relationship between SIZE2 and CFP in all models is positive. RISK is also statistically significant at 1% level in all models. RISK is negatively related to both CFP measures as also supported by the other models in this study. GROWTH and AGE are still insignificant. More interestingly, the results of this analysis implicate that the DW statistics for all models has improved compared to the pooled OLS, implying that the evidence for (positive) serial correlation is minor. The values for the DW statistics are basically the same for the fixed and

random effects specifications. The previous results captures the whole panel period 2000-2009. However, the last three years of this period represent the financial crisis years. Comparing this period to the period before the financial crisis (2000-2009) could lead to different outcomes of the effect of SRI on CFP. As mentioned before the outcomes of SRI could follow two directions: either the crisis places SRI under pressure, or it emphasizes the necessity of SRI compelling investors to give more attention to social responsibility and long-term financial returns of their investments. The estimation results for this matter is depicted in table 8.

[Place Table 9 about here]

If ROA is the dependent variable, SRI before and during the financial crisis is negative and significant. This implies that the trade-off between being socially responsible and benefiting from financial performance still exists. In addition, looking only at the sign of the coefficient the financial crisis do not change the negative effect of SRI on CFP. However, when considering the value of the coefficient, this negative effect during the financial crisis is much smaller than before the crisis (-9.157 < - 4.969). In this perspective, the results seem to follow the second direction; emphasizing the necessity of SRI. Investors are more and more willing to include social and environmental goals in their investment decisions. When ROIC is the financial performance measure, the relationship between SRI and CFP is still the same, but during the financial crisis years SRI is insignificant. During the financial crisis years SIZE2 seem to affect CFP positively, it is significant at 1% level. An explanation could be that bigger companies are better capable to cope with the negative effects of the financial crisis, for example, they have the capacity to direct resources to innovate and therefore maintaining CFP, which is often harder for small companies. Furthermore, before the financial crisis RISK is significant and negatively related to CFP as also observed in the previous models. However, it is not significant during the crisis. An explanation could be that investors are more risk-averse since it will be more difficult for them to compensate for financial losses during this period. Again, changes in GROWTH and AGE do not seem to affect CFP before and during the crisis.[36]

Now that, the results of the fixed effects and random effects specifications are clear, this study, did not yet test which model is more appropriate. As mentioned in section 5.3.3,

[36] When eliminating the less significant variable (AGE) in all models in table 8 the results do not change, therefore separate models for this are not taken into account

comparing the fixed and random effects estimates can be a test for whether there is correlation between the a_i and X_{it}, assuming that the errors and the independent variables are uncorrelated across all time periods. Thus, this study test for uncorrelated random effects. One common technique for testing this assumption is to employ a Hausman specification test (in Eviews), which is done hereafter.

Correlated Random Effects - Hausman Test

Dependent variable	Observations(N*T)	Test cross-section random effects		
ROA	600	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
		6.123795	4	0.1901
ROIC	590	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
		9.192382	4	0.0565

The null hypothesis is that there is no correlation between cross-sectional specific random effects and the independent variables (H_0: $a_i = 0$) against the alternative hypothesis that there is correlation (H_1 : $a_i \neq 0$). If H_0 holds, then the random effects specification may be a more efficient and powerful estimator. On the other hand, if H_0 is rejected and there is correlation, the random effects specification would be inconsistently estimated and therefore the fixed effects specification may be a better estimator. Since the Hausman p-values of both models in the figure above (for two different dependent variables ROA and ROIC[37]) are larger than the significance level 0.05, the H_0 cannot be rejected. The implication is that while different companies may have different errors, the errors are not correlated with independent variables. As a result, it might be statistically justifiable to use the random effects specification, which this study would prefer, since the random effects estimates could be somewhat more efficient than the fixed effects estimates. However, as seen in this chapter, the results of the fixed and random effects estimators are not very different.

[37] Models 1 and 2 in table 7.

5. CONCLUSION AND LIMITATIONS

This study has attempted to examine the existence of a trade-off between social responsibility and corporate financial performance (profitability). To examine the existence of this trade-off, this study hypothesized that socially responsible investors are less profitable than conventional investors. The hypothesis has been tested by employing panel data analysis using various least squares estimators on a small sample of European and North-American companies (institutional investors) in the financial sector for the period 2000-2009. After controlling for company size, risk, growth and company age, the empirical results confirm the negative relationship between SRI/CSP and CFP, and thus seems to support the existence of the trade-off. More importantly, the finding that social responsibility has a significant negative effect on financial performance is robust under the three different estimators (pooled OLS, cross-section fixed effects and cross-section random effects) for the total panel period 2000-2009. However, in the three most recent years (2007-2009) it seems that the negative effect of SRI on CFP diminishes, if corporate financial performance is measured by ROA. IF CFP is measured by ROIC, the effect of SRI on CFP is not even significant. In this case, it means that the relationship is ambiguous. Furthermore, the explanation capabilities of the variables remained low in all models, therefore the negative influence of SRI on CFP may not be very strong. Nevertheless, it would be reasonable to conclude that hypothesis H1 holds. This underperformance hypothesis supports the argument that institutional investors are better off by not investing socially responsible due to the negative effect it might have on their financial performance. This could be clarified by the fact that social investors underinvest in financially attractive investment options due to the restriction of the investment universe. An additional explanation could be that social investors might overinvest in financially unattractive investment options since they are not just driven by economic rationality; they believe that "doing good" weights more than just to maximize profits. The results also show that in most cases the negative effect of social responsible behavior on financial performance is stronger when financial performance is measured by ROIC instead of ROA, however this difference is minor.

Other than SRI, company size and risk do also seem to affect financial performance. Company size which is measured by market capitalization is significant and positive related to CFP, as expected. While risk, which is measured by the debt ratio is negatively related to

CFP. This is also in line with the expectations. However, growth and company age do not seem to matter, they are both insignificant in most models.

The previous results must be interpreted with limitations in mind. As this research shows results that support the arguments that there is a trade-off between SRI/CSP and CFP, this study also recognizes the problems associated with quantifying and measuring SRI. Perhaps, one of the most striking characteristic of the concept SRI is the complexity as there is no single approach since it has different local meanings depending on societal, cultural and financial factors. Therefore, measuring the degree to which companies (institutional investors) are actually behaving in socially responsible way is subjective. Moreover, the information used in this study is based on secondary data. Readers should be mindful that a secondary data source presents information that may have been composed for other reasons. Therefore, the institutional investors' websites used in this study may have been prepared to impress and persuade clients. Accordingly, this means that the data could be either biased or exaggerated. Hence, this study cannot guarantee that the information on their websites is truly objective and that they are generating their revenues only by investing in a socially responsible way. Furthermore, the final results of this study cannot be directly compared to the existing empirical studies which also investigate the relationship between SRI and CFP. The reason for this is that the method used in this study is totally different from the prior studies. While most studies measure SRI by corporate social performance (CSP) using an official rating database, this study, however, only uses websites of investors to see whether they are cooperating in social activities or not. Finally, due to the lack of data availability the sample size remained small. As a consequence of these limitations, the results form only a rough indication and not a general rule, however, in this perspective it could be a framework for further research.

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APPENDIX

APPENDIX A: list of companies (institutional investors) in the sample

	Entity Name	SRI	Country	Website
1	AARDVARK INVESTMENTS S.A.	yes	LUX	http://www.aardvarkinvestments.com/
2	AB HAVSFRUN	no	SWE	http://www.absoluteinvestments.ch/about_absolute/
3	ABERDEEN ASSET MANAGEMENT PLC	yes	GBR	http://www.aberdeen-asset.com/
4	ABSOLUTE INVEST AG	no	CHE	http://www.absoluteinvest.com/
5	AIM INVESTMENTS PLC	no	GBR	http://www.aiminvestmentsplc.com/
6	ALLIANCE TRUST PLC	no	GBR	http://investor.alliancetrust.co.uk/
7	AMANDA CAPITAL OYJ	no	FIN	http://www.amandacapital.fi/
8	ARLINGTON ASSET INVESTMENT CORPORATION	no	USA	http://www.arlingtonasset.com/company/fbr/
9	AVIVA PLC	yes	GBR	http://www.aviva.com/
10	BAILLIE GIFFORD SHIN NIPPON PLC	yes	GBR	http://www.baillliegifford.com/
11	BANK SARASIN & CIE AG	yes	CHE	http://www.sarasin.ch/internet/iech/en/
12	BLUE PLANET EUROPEAN FINANCIAL PLC	yes	GBR	http://www.blueplanet.eu/blueplanet_about_us.4.html
13	BLUEBAY ASSET MANAGEMENT	no	GBR	http://www.bluebayinvest.com/
14	BREWIN DOLPHIN HOLDINGS PLC	no	GBR	http://www.brewin.co.uk/
15	CALEDONIA INVESTMENTS PLC	no	GBR	http://www.caledonia.com/
16	C-QUADRAT INVESTMENT AG	no	AUT	http://www.c-quadrat.at/
17	CROSBY ASSET MANAGEMENT INC	no	GBR	http://www.crosby.com/en/
18	DIAMOND HILL INVESTMENT GROUP, INC.	no	USA	http://www.diamond-hill.com/cgi-bin/index.pl
19	DIAS SA INVESTMENT COMPANY	no	GRC	http://www.dias.com
20	DIC ASSET AG	no	DEU	http://www.dic-asset.de/
21	DINAMIA CAPITAL PRIVADO SA	no	ESP	http://www.dinamia.es/
22	DNB NOR ASA	yes	NOR	https://www.dnbnor.com/
23	DUNDEEWEALTH INC	no	CAN	http://www.dundeewealth.com/global/en/public/index.html
24	EATON VANCE CORPORATION	no	USA	http://www.eatonvance.com/
25	ECLECTIC INVESTMENT COMPANY PLC	no	GBR	http://www.eclecticinvest.com/stocks/frame.htm
26	ECOFIN WATER & POWER OPPORTUNITES PLC	yes	GBR	http://www.ecofin.co.uk/eco/
27	ENERGISER INVESTMENTS PLC	no	GBR	http://www.energiserinvestments.co.uk/
28	F&C ASSET MANAGEMENT PLC	yes	GBR	http://www.fandc.com/
29	FEDERATED INVESTORS INCORPORATED	no	USA	http://www.federatedinvestors.com/
30	FIDELITY PARTNERSHIP 1996	no	CAN	http://www.fidelity.ca/
31	FIRST ASSET ENERGY & RESOURCE FUND	no	CAN	http://www.firstasset.com/aboutUs/
32	FIRST CLOVER LEAF FINANCIAL CORP	no	USA	https://www.firstcloverleafbank.com/home/home
33	GAMCO INVESTORS, INC.	yes	USA	http://www.gabelli.com/
34	GMP CAPITAL INCORPORATION	no	CAN	http://www.gmpcapital.com/home/default.asp?loc1=home
35	HAKON INVEST AB	yes	SWE	http://www.hakoninvest.se/en/
36	HIGHCROFT INVESTMENTS PUBLIC COMPANY	no	GBR	http://www.highcroftplc.com/
37	HOME INVEST BELGIUM SA	no	BEL	http://homeinvestbelgium.be/site/
38	IMPAX ASSET MANAGEMENT GROUP PLC	yes	GBR	http://www.impax.co.uk/
39	INITIATIVE ET FINANCE INVESTISSEMENT	no	FRA	http://www.initiative-finance.com/anglais/notre_metier.php
40	INTEGRATED ASSET MANAGEMENT PLC	no	GBR	http://www.integratedam.com/about_us/

	Entity Name	SRI	Country	Website
41	INTERINVEST	no	GRC	http://www.interinvest.com/
42	INTERMEDIATE CAPITAL GROUP PLC	no	GBR	http://www.icgplc.com/
43	INTERNATIONAL ASSETS HOLDING CORPORATION	no	USA	http://www.fcstone.com/Pages/default.aspx
44	INVESTEC PLC	yes	GBR	http://www.investec.com/
45	INVESTMENT COMPANY PLC (THE)	no	GBR	http://www.ici.org/
46	INVESTOR AB	yes	SWE	http://www.investorab.com/en
47	IPG INVESTMENT PARTNERS GROUP	no	DEU	http://www.ipg-group.de/home/
48	JENSEN & MOLLER INVEST AS	no	DNK	http://www.jensen-moller.dk/
49	JOINT STOCK COMPANY OPEN INVESTMENTS	no	RUS	http://www.opin.ru/?clng=en
50	KINGSWALK INVESTMENTS LIMITED	no	GBR	http://www.kingswalkinvestments.com/
51	KLIMA INVESTMENT GMBH & CO KGAA	yes	DEU	http://www.klima-investment.de/
52	LADENBURG THALMANN FINANCIAL SERVICES	no	USA	http://www.ladenburg.com/
53	LEGENDARY INVESTMENTS PLC	no	GBR	http://www.legendaryinvestments.co.uk/
54	LIONTRUST ASSET MANAGEMENT PLC	no	GBR	http://www.liontrust.co.uk/about_liontrust.html
55	LIVERMORE INVESTMENTS GROUP LIMITED	no	VGB	http://www.livermore-inv.com
56	LONDON AND ST. LAWRENCE INVESTMENT COMPANY	no	GBR	http://www.londonandstlawrence.com/
57	LONDON CAPITAL GROUP HOLDINGS PLC	no	GBR	http://www.londoncapitalgroup.co.uk/
58	LONDON FINANCE & INVESTMENT GROUP PLC	no	GBR	http://www.lfig.com/
59	LOWLAND INVESTMENT COMPANY PLC	no	GBR	http://lowlandsinvest.com
60	MAJEDIE INVESTMENTS PLC	no	GBR	http://www.majedie.co.uk/
61	MARFIN INVESTMENT GROUP HOLDINGS S.A	no	GRC	http://www.marfininvestmentgroup.com/Detail.aspx?amid=11023
62	NATIXIS	yes	FRA	http://www.globalam.natixis.com/en/index.php
63	OMEGA SA	no	GRC	http://www.omegasa.com/
64	ORESUND INVESTMENT AB	no	SWE	http://www.oresund.se/english.html
65	PZENA INVESTMENT MANAGEMENT INC	no	USA	http://www.pzena.com/about-us/who-we-are.php
66	RAB CAPITAL PLC	no	GBR	http://www.rabcap.com/
67	RAYMOND JAMES FINANCIAL, INC.	no	USA	http://www.raymondjames.com/about/index.htm
68	REAL ESTATE INVESTORS PLC	no	GBR	http://www.reiplc.com/
69	SEAMARK ASSET MANAGEMENT LIMITED	no	CAN	http://www.seamark.ca/wa_index.htm
70	SEI INVESTMENTS COMPANY	no	USA	http://www.seic.com/enUS/about.htm
71	SEMAPA - SOCIEDADE DE INVESTIMENTO	yes	PRT	http://www.semapa.pt/default_en.asp?detectflash=false
72	SIGMA CAPITAL GROUP PLC	yes	GBR	http://www.sigmacapital.co.uk/page/Venture_Capital.aspx
73	SUSTAINABLE PERFORMANCE GROUP AG	yes	CHE	http://www.zukunftsaktie.ch/eindex.cfm
74	SYNDICATE ASSET MANAGEMENT PLC	yes	GBR	http://www.syndicateplc.com/
75	TAYLOR CAPITAL GROUP, INC.	no	USA	http://www.taylorcapitalgroup.com/
76	TD AMERITRADE HOLDING CORPORATION	no	USA	http://www.amtd.com/about_us/factsheet.cfm
77	TETRAGON FINANCIAL GROUP LIMITED	no	GBR	http://www.tetragoninv.com/tfg/about/overview/
78	U.S. GLOBAL INVESTORS, INC.	no	USA	http://www.usfunds.com/
79	VOSTOK NAFTA INVESTMENT LTD.	no	SWE	http://www.vostoknafta.com/web/index.html
80	WILMINGTON CAPITAL MANAGEMENT	no	CAN	http://www.wilmingtoncapital.com/about_us/about_us.html

APPENDIX B: list of social investors and their corresponding SRI approaches

	Social investor	**SRI Approach**
1	Aardvark Investments SA	Green investing
2	Aberdeen Asset Management PLC	ESG-theme
3	Aviva PLC	Sustainability investing
4	Baillie Gifford Shin Nippon PLC	ESG-theme
5	Bank Sarasin & CIE AG	Sustainability investing
6	Blue Planet European Financial PLC	Green investing
7	DNB Nor ASA	Ethical screening
8	Ecofin Water Power Opportunities PLC	Green investing
9	F & C Asset Management PLC	ESG-theme
10	Gamco Investors Inc	Ethical screening
11	Hakon Invest AB	Sustainability investing
12	Impax Asset Management Group PLC	Green investing
13	Investec PLC	Sustainability investing
14	Investor AB	Sustainability investing
15	Klima Invest Gmbh & Company	Green investing
16	Natixis	ESG-theme
17	Semapa SA	Sustainability investing
18	Sigma Capital Group PLC	Green investing
19	Sustainable Performance Group AG	Sustainability investing
20	Syndicate Asset Management PLC	Green investing

APPENDIX C: Descriptive statistics, correlation matrix and results of all estimation

Table 1: Descriptive statistics

	2000 (N=43)				2001 (N=46)				2002 (N=52)				2003 (N=53)			
	Mean	Max	Min	Std. Dev.	Mean	Max	Min	Std. Dev.	Mean	Max	Min	Std. Dev.	Mean	Max	Min	Std. Dev.
ROA	10,6	52,1	-17,0	15,1	5,7	84,1	-44,0	18,3	2,2	95,0	-64,9	23,1	5,1	82,6	-33,9	15,9
ROIC	17,2	125,9	-19,4	25,9	9,4	113,9	-55,4	28,6	3,8	117,7	-111,2	31,8	8,4	95,7	-38,3	22,4
SRI	0,3	1,0	0,0	0,5	0,3	1,0	0,0	0,5	0,3	1,0	0,0	0,5	0,3	1,0	0,0	0,5
SIZE1	11.283,6	279.979,6	3,8	45.413,4	10.019,9	266.143,4	5,3	41.660,5	10.681,4	287.577,2	3,9	44.341,3	13.346,2	360.038,4	3,3	55.642,8
SIZE2	2.017,9	36.286,5	4,3	5.755,3	1.574,4	27.620,3	1,4	4.267,9	1.019,1	16.153,3	3,8	2.433,6	1.446,5	19.761,3	3,0	3.218,9
RISK	14,2	65,8	0,0	18,5	13,5	69,9	0,0	16,8	16,0	73,4	0,0	18,9	20,3	84,2	0,0	22,6
GROWTH	1.441,1	52.834,6	-65,1	8.055,8	46,9	2.080,4	-80,5	308,8	0,6	89,6	-79,9	34,0	77,7	3.603,4	-90,5	495,6
AGE	44,7	304,0	3,0	60,6	43,7	305,0	4,0	59,0	41,6	306,0	3,0	56,9	41,6	307,0	4,0	56,7

	2004 (N=49)				2005 (N=64)				2006 (N=70)				2007 (N=73)			
	Mean	Max	Min	Std. Dev.	Mean	Max	Min	Std. Dev.	Mean	Max	Min	Std. Dev.	Mean	Max	Min	Std. Dev.
ROA	6,1	79,5	-25,6	13,8	8,8	94,3	-83,1	21,3	10,4	51,0	-34,3	12,7	6,8	46,6	-29,7	12,5
ROIC	9,3	97,2	-69,2	22,4	11,2	95,8	-161,5	30,0	15,9	88,6	-37,6	18,6	9,6	60,6	-101,9	21,0
SRI	0,3	1,0	0,0	0,5	0,3	1,0	0,0	0,4	0,3	1,0	0,0	0,4	0,3	1,0	0,0	0,4
SIZE1	14.440,2	431.294,6	4,0	62.226,0	14.707,4	438.657,3	6,6	62.481,3	21.992,1	604.366,2	8,2	99.824,6	25.287,1	757.758,5	0,6	117.042,9
SIZE2	1.737,8	27.445,6	4,9	4.171,9	1.887,0	29.020,0	8,2	4.470,6	2.713,1	41.298,1	7,5	6.975,8	2.638,5	35.009,3	1,5	5.807,3
RISK	19,3	128,8	0,0	24,6	15,3	90,8	0,0	19,8	12,9	88,7	0,0	17,7	13,9	72,4	0,0	17,3
GROWTH	41,0	1.059,2	-83,7	143,7	46,4	451,9	-87,4	83,2	68,9	1.608,4	-93,3	206,3	124,9	4.254,5	-91,3	522,2
AGE	40,2	308,0	1,0	55,0	38,9	309,0	2,0	53,4	37,3	310,0	3,0	51,7	37,2	312,0	3,0	51,0

	2008 (N=68)				2009 (N=61)				2000-2009 (NT=590)			
	Mean	Max	Min	Std. Dev.	Mean	Max	Min	Std. Dev.	Mean	Max	Min	Std. Dev.
ROA	-3,9	44,2	-98,8	24,0	2,7	54,9	-80,1	18,1	5,3	95,0	-98,8	18,3
ROIC	-2,8	55,1	-139,4	30,8	2,1	59,5	-179,3	32,5	8,2	125,9	-179,3	27,1
SRI	0,3	1,0	0,0	0,5	0,3	1,0	0,0	0,4	0,3	1,0	0,0	0,5
SIZE1	25.269,4	770.976,2	0,4	114.454,4	22.339,7	639.174,1	0,2	107.667,3	17.743,4	770.976,2	0,2	84.080,1
SIZE2	1.136,2	15.170,2	0,3	2.335,6	1.443,9	17.628,6	1,0	3.234,5	1.796,7	41.298,1	0,3	4.568,5
RISK	17,6	85,9	0,0	20,4	15,4	72,4	0,0	18,6	15,8	128,8	0,0	19,6
GROWTH	34,2	1.470,7	-93,5	195,1	8,9	896,2	-100,0	122,7	153,2	52.834,6	-100,0	2.199,0
AGE	38,6	313,0	4,0	52,2	39,8	314,0	5,0	51,0	39,9	314,0	1,0	53,9

Table 2: Correlation matrix

	ROA	ROIC	SRI	SIZE1	SIZE2	RISK	GROWTH	AGE
ROA		0,9159*	-0,161*	-0,0506*	0,0298	-0,1199*	-0,0065	-0,0463
ROIC			-0,1522	-0,0377	0,0447	-0,1722*	-0,0073	-0,0562
SRI				0,3091*	0,2981*	0,1287*	0,0637	0,2859*
SIZE1					0,7737*	0,0624	-0,0010	0,5726*
SIZE2						0,0341	-0,0151	0,6726*
RISK							0,0233	0,0244
GROWTH								-0,0333
AGE								

Note: * indicates correlation is significant at 1% level (two-tailed ,pearson)

Table 3: Pooled OLS estimation results of CFP for the total panel period 2000-2009

MODELS:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Independent and control variables	Dependent variable							
	ROA		ROIC		ROA		ROIC	
C	12.60053 (5.5350)*	11.81949 (5.5828)*	15.61696 (4.7583)*	14.81027 (4.8567)*	9.879559 (5.0961)*	9.232629 (5.1818)*	12.57744 (5.4323)*	11.19352 (5.7876)*
SRI	-7.805446 (-9.1308)*	-7.890182 (-10.7315)*	-8.586382 (-7.0828)*	-8.937397 (-8.3870)*	-6.607339 (-6.9450)*	-6.787634 (-8.1126)*	-7414351 (-6.3340)*	-7.884732 (-7.9834)*
SIZE1	0.00000835 (1.5811)		0.00000131 (1.3217)		0.00000404 (0.8527)		0.00000829 (0.9275)	
SIZE2		0.000611 (3.2921)*		0.001093 (3.3144)*		0.000592 (3.2635)*		0.001058 (3.2815)*
RISK	-0.159029 (-5.3012)*	-0.144404 (-4.9388)*	-0.231303 (-4.2669)*	-0.215143 (-4.1699)*	-0.125436 (-4.7362)*	-0.112176 (-4.4320)*	-0.189641 (-4.3176)*	-0.175028 (-4.3664)*
GROWTH	0.0000106 (0.1692)	0.0000154 (0.2609)	0.0000428 (0.4819)	0.0000507 (0.6025)				
AGE	-0.02333 (-1.7165)	-0.044282 (-2.8741)**	-0.024973 (-1.1080)	-0.067155 (-2.4429)**	-0.009036 (-0.7155)	-0.033140 (-2.1829)**	-0.008551 (-0.4287)	-0.053684 (-2.0229)**
R^2	0.0538	0.0595	0.0515	0.0653	0.0309	0.0353	0.0279	0.0378
DW	0.7126	0.7723	0.7889	0.8561	0.7729	0.8320	0.8705	0.9230
NT	610	600	600	590	650	640	640	630

Notes: *, **, ***represent significance levels at the 1%, 5%, and 10%, respectively.
t-values are in parentheses.

Table 4: Joint significance test for models 1 and 3

Model 1			
Wald Test:	H_0 : β3=0, β5=0, β6=0 H_1 : not all are simultanously zero		
Test Statistic	Value	df	Prob.
F-statistic	1.054247	(3, 604)	0.3680
Chi-square	3.162741	3	0.3672
Restrictions: C(3)=0, C(5)=0, C(6)=0			

Model 3			
Wald Test:	H_0 : β3=0, β5=0, β6=0 H_1 : not all are simultanously zero		
Test Statistic	Value	df	Prob.
F-statistic	0.879202	(3, 594)	0.4516
Chi-square	2.637607	3	0.4509
Restrictions: C(3)=0, C(5)=0, C(6)=0			

Notes: the dependent variable in model 1 is ROA, and in model 3 ROIC. Restrictions are linear in coefficients

This produces a F and Chi-square(3xF) statistic. "Prob" is the p-value of the test. That is in model 1 under H_0 that C(3)=0, C(5)=0 and C(6)=0, the probability of drawing an F-statistic as large as 1.054 is about 0.37. In model 3 under the same restriction the probability of drawing an F-statistic as large as 0.879 is about 0.45.

Table 5: Pooled OLS estimation results with AR(1) errors (correction for serial correlation) of CFP for the total panel period 2000-2009

MODELS:	(6)	(8)
Independent and control variables	Dependent variables	
	ROA	ROIC
C	6.047069 (1.5045)	7.859965 (3.0463)*
SRI	-4.471587 (-2.3566)**	-4.552360 (-1.9889)**
SIZE2	0.000515 (3.7909)*	0.000882 (1.9685)**
RISK	-0.087403 (-1.1017)	-0.173337 (-1.1045)
AGE	-0.029230 (-0.8445)	-0.042973 (-0.1105)
AR(1)	0.566337 (5.5758)*	0.536652 (5.3614)*
R^2	0.3637	0.2868
DW	2.2029	1.8626
NT	563	554

Notes: *, **, ***represent significance levels at the 1%, 5%, and 10%, respectively. t-values are in parentheses

Table 6: Cross-section fixed effects estimation results of CFP using the IF condition for the total panel period 2000-2009

MODELS:	(1)	(2)	(3)	(4)
	Dependent variables			
Independent and control variables	ROA		ROIC	
	SRI =1	SRI = 0	SRI = 1	SRI = 0
C	7.702974 (2.0972)**	10.517063 (5.2465)*	10.05997 (2.3115)**	12.37292 (4.1203)*
SIZE2	0.0000216 (0.3143)	0.001718 (3.9982)*	0.00000268 (0.0240)	0.003076 (5.2096)*
RISK	-0.352984 (-2.0433)**	-0.244173 (-4.1058)*	-0.426451 (-2.2458)**	-0.408998 (-4.3688*)
GROWTH	0.0000322 (1.0743)	0.004650 (1.8209)	0.0000193 (0.5620)	0.006219 (1.9390)
R^2	0.3614	0.5725	0.3502	0.4605
DW	1.2721	1.7125	1.2703	1.5192
NT	168	470	168	460

Notes: *, **, ***represent significance levels at the 1%, 5%, and 10%, respectively. t-values are in parentheses.

Table 7: Cross-section fixed effects estimation results of CFP with lagged dependent variables using the IF condition

MODELS:	(1)	(2)	(3)	(4)
	Dependent variables			
Independent and control variables	ROA		ROIC	
	SRI =1	SRI = 0	SRI = 1	SRI = 0
C	3.962797 (0.9205)	7.351167 (4.2161)*	5.699222 (1.1024)	7.587287 (2.4134)**
SIZE2	0.0000200 (0.2893)	0.001623 (2.9874)*	0.00000299 (0.3191)	0.003013 (2.9679)*
RISK	-0.221413 (-1.1282)	-0.187993 (-2.8656)*	-0.295598 (-1.3471)	-0.312564 (-2.7127)*
GROWTH	0.002616 (1.6295)	0.007025 (1.6666)	0.003108 (1.8081)	0.010242 (1.7906)
ROA(-1)	0.513423 (3.9510)*	0.106732 (1.0614)		
ROIC(-1)			0.451793 (3.9971)*	0.200055 (3.7225)*
R^2	0.4483	0.6492	0.4388	0.5674
DW	1.7440	2.1827	1.8090	2.1069
NT	151	426	151	417

Notes: *, **, ***represent significance levels at the 1%, 5%, and 10%, respectively. t-values are in parentheses.

Table 8: Cross-section random effects estimation results of CFP for the total panel period 2000-2009

MODELS:	(1)	(2)	(3)	(4)
Independent and control variables	ROA	ROIC	ROA	ROIC
C	11.81513 (2.0406)**	15.03635 (2.2522)**	10.78991 (2.1740)**	12.21694 (2.9328)*
SRI	-7.292786 (-3.0250)*	-8.0481 (-2.7306)*	-7.563989 (-2.8639)*	-6.913920 (-2.8948)*
SIZE2	0.000344 (2.5487)**	0.000721 (2.6857)*	0.000264 (1.9796)**	0.000729 (2.6247)*
RISK	-0.202139 (-5.7103)*	-0.301178 (-5.3521)*	-0.221684 (-5.5372)*	-0.242292 (-4.5282)*
GROWTH	0.000101 (1.1487)	0.000130 (1.1274)	0.000107 (1.2665)	
AGE	-0.033468 (-1.0482)	-0.050537 (-1.1368)		-0.038689 (-0.9679)
Weigthed statistics				
R^2	0.0354	0.0433	0.0397	0.0237
DW	1.4878	1.3082	1.4703	1.2891
NT	600	590	638	630

Notes: *, **, ***represent significance levels at the 1%, 5%, and 10%, respectively. t-values are in parentheses. The Swamy-Arora estimator of the component variances is used. The summary statistics for random effects GLS is weighted data

Table 9: Cross-section random effects estimation results of CFP for the period before the financial crisis and during the financial crisis

MODELS:	(1)	(2)	(3)	(4)
	Dependent variables			
Independent and control variables	ROA		ROIC	
	Before financial crisis 2000-2006	Financial crisis years 2007-2009	Before financial crisis 2000-2006	Financial crisis years 2007-2009
C	14.78395 (4.1086)*	5.727172 (0.8796)	20.33511 (5.4336)*	4.497738 (0.5046)
SRI	-9.156883 (-6.3187)*	-4.969068 (-4.2297)*	-10.56576 (-6.5401)*	-4.235056 (-1.6239)
SIZE2	0.000277 (1.5785)	0.000490 (2.9120)*	0.000651 (1.7363)	0.000859 (3.4122)*
RISK	-0.162583 (-4.0809)*	-0.145028 (-1.8228)	-0.298777 (-5.0767)*	-0.141949 (-0.9779)
GROWTH	0.0000471 (1.0320)	0.005029 (0.9355)	0.0000598 (0.9113)	0.007002 (1.056485)
AGE	-0.033544 (-0.7771)	-0.014045 (-0.5103)	-0.063463 (-0.9102)	-0.014477 (0.51620)
Weighted Statistics				
R^2	0.0406	0.0274	0.0663	0.0236
DW	1.5365	2.4344	1.5541	2.0749
NT	394	206	387	203

Notes: *, **, ***represent significance levels at the 1%, 5%, and 10%, respectively. t-values are in parentheses. The Swamy-Arora estimator of the component variances is used. The summary statistics for random effects GLS is weighted data