

## COVER PAGE

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1) Subtheme 7.2 Venture Capital (Government Venture Capital interventions for regional innovation, successful case studies of government-leveraged venture investment, University Venture Capital funds, regional Venture Capital funds)

2) Title: Green investment: concept, design and conflict of interests on the environmental mutual fund industry – How Triple Helix interactions can minimize conflicts and boost a sustainable economy

3) ABSTRACT

The present paper addresses the Law and Economics of Green Investment (Green Shares) in the specific field of green mutual funds, and analyzes the principal agent problem that exists along the green investment cycle, mainly between the single investor and the green fund manager, suggesting regulation and optimal contracting clauses in order to reduce and minimize the conflict of interests and asymmetric information inherent to the relationship. The paper introduces and establishes a concept for Green investment, describing financial instruments that deals with it (mutual funds, pension funds, private equity and hedge funds). Empirical data is presented, dealing with fund performance and effects of remuneration schemes and covenants. The paper ends with normative suggestions of new regulation and contracting possibilities in the area of Green Mutual Funds, highlighting the role that Triple Helix Interactions can have in implementing this new paradigm.

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5) Keywords: Green Finance, Innovation, Principal Agent Problem, Optimal Contracting, Regulation.

6) Structure: introduction, state of the art, methodology, findings and interpretation, conclusions, policy implications and directions for further research.

## INTRODUCTION

MILTON FRIEDMAN, in the early 70's of the 20<sup>th</sup> century, wrote a short article entitled "The Social Responsibility of Business is to Increase its Profits"<sup>1</sup>. According to him, executives of corporations should use shareholder's assets and resources to increase the value of the company, not in another way, like, for example, to reduce pollution (an example of *internalization of externalities*). At the present time, the argument appears to be old fashioned, due to the fact of the established technical literature stating that the interests of both shareholders and stakeholders must be considered in order to maximize the value of the firm<sup>2</sup>, what will, in the end, increase the *social net welfare*. On the same ground, the concept of *sustainability*, that was seminal in that decade today is in the mainstream of academic and professional discussions. Ethics in business<sup>3</sup>, the role of trust and the advantages of cooperation in long term relationships are some of the philosophical foundations<sup>4</sup> of this new investment trend. Following this path, the market for investment

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<sup>1</sup> See FRIEDMAN (1970).

<sup>2</sup> See JENSEN (2001).

<sup>3</sup> See specially SEN (1991).

<sup>4</sup> For more details, see DUPRE and GIRERD-POTIN (2004).

consultancy firms that consider on its evaluations Environmental, Social and Governance (ESG)<sup>5</sup> issues and the flow of money into this kind of investment<sup>6</sup> increases in a fast pace. The fact is that it is the money of shareholders that is being used for increase sustainability (e.g., investment in energy saving, recycling, renewable energy, etc), creating in many occasions profitable returns to firms and their owners<sup>7</sup>, an affirmative reinforced by case studies covering mutual funds, companies and industrial sectors linked with the environment<sup>8</sup>.

Considering that the demand for natural resources is 35% higher than our planet's capacity to renew them<sup>9</sup> and that the cost of the damages caused to the environment by the six main relevant economic sectors with direct impact in the environment (water capture, greenhouse gas, acid rain, coal, nuclear waste, organic waste) were estimated to be around US\$ 1,5 trillion dollars<sup>10</sup>, nowadays it is common ground to realize that the environment is part of the life of corporations and also of the capital market. There is a growing set of environmental legislation and regulation established both on the national and on the international levels, either by legislators and administrative regulators<sup>11</sup>, in areas like environmental information disclosure, legal and financial incentives for green investing, fund manager duties, regulation of green hedge funds and so on. Non-governmental organizations - NGO, and institutional investors are also actively acting in this kind of business. Issues like climate change, sustainability and good environmental practices influence in a important way markets, investors and corporations behavior as well as the use of their resources. In order to reinforce this perspective, regarding the private sector, a report<sup>12</sup> directed to 1.576 executives found out that 40% of them believe that some sustainable elements are important for business.

The conceptual boundaries of Corporate Social Responsibility, Social Responsible Investment, Ethical and Environmental Investment are interrelated but must be analyzed in order to avoid or minimize *uncertainty, asymmetric information, lack of coordination* and to reduce *transaction costs*<sup>13</sup> of the actors involved in the financial markets, making it more efficient. From now on, what can asserted is that there is a important field to be explored, as well as a considerable amount of questions that can be better answered or clarified<sup>14</sup>. The area of green investment is growing and affecting markets in a important way. It is a broad concept that covers an array of innumerable financial instruments and areas that are presenting, to say the minimum, an ambiguous<sup>15</sup> nature and discussions about its design, performance, regulation and contractual relations are increasing in number and in depth.

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<sup>5</sup> Environmental, Social and Governance. Asset4, a Swiss investing consulting, says that 80% of the company value is not visible in the financial statements of companies. This means that some percentage of this can be related to ESG points (i.e, there is important room for market capitalization).

<sup>6</sup> According to the United Nations Environment Programme (2008), "Investment between now and 2030 is expected to reach \$450 billion a year by 2012, rising to more than \$600 billion a year from 2020. The sector's overall performance during 2007 and into 2008 sets it on track to achieve these levels".

<sup>7</sup> According to HORST, ZHANG and RENEBOOG (2007:13) "The following components of CSR can enhance shareholder value and thus social welfare: good corporate governance, sound environmental standards, and a care of stakeholders relations. Participating in other social and ethical issues is likely to destroy firm value". See, also, the studies that are made by the Sustainable Investment Research Platform. [www.sirp.se](http://www.sirp.se).

<sup>8</sup>WHITE and KIERNAN (2004).

<sup>9</sup> The Economics of Ecosystems and Biodiversity (2010)

<sup>10</sup> Source: TRUCOST Company.

<sup>11</sup> The Securities Exchange Commission has some environmental disclosure requirements for listed companies. The Sarbanes-Oxley is another example.

<sup>12</sup> Mckinsey Company.

<sup>13</sup>For COOTER AND ULLEN (2004:91-92), "Transaction costs are the costs of exchange." According to him the transaction costs can be divided in 3 steps (search costs, bargaining costs and enforcement costs).

<sup>14</sup> According to DAVIS (2008:14), "High Quality research highlights opportunities as well as the risks". The Financial Times article says that "Only a decade ago, the idea of a standalone firm researching the environmental and social impact of corporate activity would have been dismissed out of hand. Yes, one or two ethical funds did exist, but only as a tiny cog within a large machine. Today, green investment and, consequently, analysis of green issues is big business" *Financial Times. Environmental Investing*. Monday, February 4, 2008, p. 14.

<sup>15</sup>"Funds appears unsure about their underlying aims, environmental concerns or turning a profit, but research is sharpening focus" says SOPHIA GREEN. *idem*. p. 13.

Besides green investment being a potential and growing field for investors and businessmen (only the market for renewable energy was expected to entail US\$200 billion worldwide in 2010), the final outcome of the Climate Change Conference held in Copenhagen in the end of 2009 signals one important issue: the failure of countries in establishing an efficient working framework to tackle the climate change problem for the next years, and, as a consequence, the necessity of more private investment and financial instruments in order to really boost the so called "Green Revolution". The mission is not easy to be accomplished. ROBERT CONSTANZA<sup>16</sup>, for example, estimated the value of biodiversity US\$ 33 trillion dollars. As a result, in order to try to accomplish the objective of establishing a sustainable environment and industry, some special regulation is necessary (on both public and private sectors) in order to ease and increase the flow of capital into these instruments, more specifically regarding green mutual funds, the object of the present paper.

## STATE OF THE ART

### Global Foundations of Green Investment

The foundations and rationales for Green Investment are multiple, coming from different sources (academic, governmental, local, global), what configure a typical triple helix framework of interactions. More precisely, the perception of the necessity of considering the environment as an essential part of the economic cycle - goes back to the early 60's of the 20<sup>th</sup> century. One of the pioneers about the effects of human intervention in the nature, and its consequences was RACHEL CARSON<sup>17</sup>. Her book dealt about the use of pesticides such as DDT<sup>18</sup> and the damages that it caused to humans and environment, what resulted in the ban of it in 1972 by the United States government. After the spread of theories that established the economic development without considering the environment, a conscience about the scarcity of resources and the fact that they must be explored in a rational way, within a context of equilibrium between economic development and sustainable environment has aroused. This notion was formally addressed in 1968, on the scope of the Club of Rome, in a report entitled the "Limits of Growth", lead by DENNIS MEADOWS<sup>19</sup> (a work that have been recently reviewed<sup>20</sup>). In the same year, the Stockholm Convention was held<sup>21</sup>. The report of the convention can be considered as a milestone for the further development of global protection of the environment, and a shift of a purely economic perspective to a more holistic one, as observed by LISA NELSON<sup>22</sup>.

Following this track, in 1987 was published the Brundtland Report, also known as "Our common Future", result of the studies of the World Commission on Environment and Development (WCED), established in 1983, named after the name of its director, GRO HARLEM BRUNDTLAND. It stated the importance of all nations in adopting policies towards sustainable development, a concept that was defined in a UN General Assembly resolution<sup>23</sup>. After Stockholm, other international meetings on the level of the United Nations that dealt about the environment were Nairobi (in 1982<sup>24</sup>), Rio (in 1992, that resulted in the Agenda 21<sup>25</sup>) and Johannesburg (in 2002<sup>26</sup>). All these international meetings were evolutions in the direction of the establishment of goals for the next (this) Millennium. From this Millennium Task Force<sup>27</sup>, one of the objectives is to "Ensure Environmental Sustainability". This objective is periodically measured<sup>28</sup>.

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<sup>16</sup> CONSTANZA ET AL (1997)

<sup>17</sup> CARSON (1962).

<sup>18</sup> The acronym stands for dichlorodiphenyltrichloroethane.

<sup>19</sup> See MEADOWNS, RANDERS, MEADOWS and BEHRENS (1972).

<sup>20</sup> See MEADOWNS, RANDERS and MEADOWS (2004).

<sup>21</sup> *United Nations Conference on the Human Environment*, (Stockholm from 5 to 16 June 1972).

<sup>22</sup> NELSON (2007:158).

<sup>23</sup> The UN General Assembly resolution 42/87 gave the following concept of sustainable development: "(...) sustainable development, which implies meeting the needs of the present without compromising the ability of future generations to meet their own needs (...)".

<sup>24</sup> *Nairobi Declaration*, (Nairobi, from 10 to 18 may 1982).

<sup>25</sup> *United Nations Conference on Environment & Development* (Rio de Janeiro, 3 to 14 June 1992)

<sup>26</sup> *World Summit on Sustainable Development* (WSSD) (Johannesburg, from 26 August to 4 September 2002)

<sup>27</sup> *United Nations Millennium Project*.

<sup>28</sup> For the last report, made in 2005, see <http://www.unmillenniumproject.org/documents/Environment-complete-lowres.pdf>

## Economic Foundations of Green Investment

Economic scholarship did not ignore the impact of environment and the effect of a modification on the existence of natural resources in the market. The works of NICHOLAS GEORGESCU-ROEGEN<sup>29</sup>, as well as KARL WILLIAM KAPP<sup>30</sup> confirm this<sup>31</sup>. In mainstream economics, the impact of economic activity in the environment, a classic case of negative externality, was first addressed by ARTHUR PIGOU and his idea on efficient social level of activity, that can be reached through taxation of private parties. One of its critics was RONALD COASE, on its foundational "Problems of Social Cost"<sup>32</sup> and the *Coase Theorem*. Market agents created instruments that use the protection of the environment as an incentive for transactions (e.g., the Kyoto Protocol, that it is not the only one innovation that already exists<sup>33</sup>). In reality, according to PETER SAND<sup>34</sup>, after command and control and market based instruments there is a "third wave" of environmental regulation, one that deals with disclosure of environmental information.

## Effects on Firms: CSR and SRI

All this movement towards the integration of the environment in the economic cycle also captured the attention of the most important agent of the capitalist society: the firm. The notion that firms activities can have important consequences to the environment and that this can affect, in the long run, the own share value of the company, made shareholders and managers care about the sustainability of both the environment and the company itself, considering these grounds are connected. As a result, Corporate Social Responsibility and Social Responsible Investment started to increase their participation on the discussions that involved the firm and its value maximization.

## Corporate Social Responsibility

There is a considerable array of concepts of Corporate Social Responsibility. HEAL gives a concept in the context of financial markets, defining it as a program of actions "which reduce the extent of externalized costs or avoid distributional conflicts"<sup>35</sup>. The kind of Corporate Social Responsibility dealt in here is the strategic one, not the altruistic, the latter being sometimes partially disconnected from the maximization of the value of the company perspective. In this sense, companies that adopt CSR practices are aligned and consistent with "strategic CSR and rational, profit-seeking management decision-making"<sup>36</sup>, to use the words of SIEGEL and VITALIANO.

More specifically, and in connection to Green Investment, MAZURKIEWICZ<sup>37</sup> argues that the environmental aspects of CSR are defined as "the duty to cover the environmental implications of the company's operations, products and facilities; eliminate waste and emissions; maximize the efficiency and productivity of its resources; and minimize practices that might adversely affect the enjoyment of the country's resources by future generations. In the emerging global economy, (...) companies are more frequently judged on the basis of their environmental stewardship".

According to STAVINS, REINHARDT and VIETOR<sup>38</sup>, the allegation of profits in the long run can be used to some extent to justify investment in Corporate Social Responsibility. Besides this, it must be asserted that CSR is not a panacea for companies or for society. Companies can adopt CSR practices, but

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<sup>29</sup> GEORGESCU-ROEGEN (1971).

<sup>30</sup> KAPP (1978).

<sup>31</sup> Despite the work of these authors, the application of their thoughts is more related to an specific field, called ecological economics. Mainstream economic scholarship did not discuss their works in depth, because, according to GEORGESCU-ROEGEN (1986:11), scarcity of resources is considered to be only superficial, "because anything is obtainable if one is prepared to invest the necessary capital in labor and equipment".

<sup>32</sup> COASE (1960).

<sup>33</sup> For other examples, see COWAN (1997).

<sup>34</sup> SAND (2002:5).

<sup>35</sup> HEAL (2004:12).

<sup>36</sup> SIEGEL and VITALIANO (2006:15).

<sup>37</sup> MAZURKIEWICZ (2008:2).

<sup>38</sup> STAVINS, REINHARDT and VIETOR (2008).

only in a efficient way, if they want to be competitive. An empirical study by BARNEA and RUBIN<sup>39</sup>, that took in account the largest 3.000 biggest corporations of US, showed that sometimes insiders can make firms overinvest in CSR when they bear a little amount of the costs of doing it. In reality, managers normally treat investment in CSR just like any other business, what will logically reduce the range of the activities considered to be profitable in both social and private grounds.

In order to illustrate the fact that investment in CSR have concrete effect in the value of the company, a study made by HALL and RIECK<sup>40</sup> shows that signaling corporate social actions present a positive effect on stock prices (included in this set of companies firms producing environmentally-friendly products). In the same direction is a study made by ZIEGLER, SCHRÖDER and RENNIN<sup>41</sup> that linked environmental performance of the industry where company operates with positive effect on the stock performance. It covered European corporations, taking in consideration average monthly stock returns from 1996 to 2001. In the United States, a study by KEMPF and OSTHOFF covering US stocks from 1991 to 2004, concludes that in overall, "the performance of the socially responsible portfolios are never significantly negative<sup>42</sup>".

### **Social Responsible Investment**

Interconnected with CSR is the Social Responsible Investment (SRI) area. The body of literature that deals with this is rising and there are different categories of approaches and analysis of it. A considerable work is made by ANDREAS HOEPENER<sup>43</sup>. The author made a categorization of the literature of social responsible investment. Another important work covering a wide range of areas is made by BENJAMIN RICHARDSON<sup>44</sup>.

Social Responsible investment can be considered the umbrella where some kinds of investment, like Ethical, Social and Environmental are accommodated. But this does not mean that all investment in this area follow the same and specific factors and basics. For example, one of the main characteristic of Social Responsible Investment is that it has a screening technique. This means that companies that do not fulfill or accomplish certain factors are excluded from the portfolio of investment of a mutual fund manager. This does not necessarily means that all kinds of SRI will choose the same target companies. For example, an ethical investor could avoid investment in companies that produce tobacco and guns; on the other hand, a green investor could invest in an oil company, if it adopts sustainable practices and has a long term view of the business. The construction of the portfolio of investment will depend mainly of the nature of the fund, the investment strategy of it and also of the investor behavior.

Considering that only a sustainable industry can face the challenges of the new century, the area of environmental finance, normally situated bellow the umbrella of SRI – Social Responsible Investment – still is full of asymmetric information. For instance, i) there is not a clear cut concept for the term green investment; ii) the investment techniques of the green fund managers vary and sometimes are not fully disclosed for the investors; iii) there is not yet an efficient sanctioning system for target companies that commit "greenwash", i.e, the disclosure of misleading environmental information regarding the company; and iv) there is a growing set of principal agent problems along the green investment cycle and specially between the single green investor and the green fund manager.

### **Ambiguity and Green Investment Style**

Ambiguity is an important characteristic of Green Investing, and a basic factor of *uncertainty*, what can make *risk averse* investors to avoid products with this characteristic, as observed by EASLEY and O'HARA (2005). The absence of a clear cut concept of green investment, and also the lack of stable data relating returns and profits demand studies in the area, in order to develop the field and reduce the already mentioned *uncertainty* – at least in the acceptable level for financial markets. In the beginning of the 90's general SRI and Green investment were more strictly linked, but now with the advance of latter, there are different points of view between them, like investment criteria, screening technique and so on.

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<sup>39</sup>BARNEA and RUBIN (2006).

<sup>40</sup> HALL and RIECK (1998).

<sup>41</sup> ZIEGLER, SCHRÖDER and RENNIN (2007).

<sup>42</sup> KEMPF and OSTHOFF (2006:13).

<sup>43</sup> HOEPNER (2007).

<sup>44</sup> RICHARDSON, (2008).

Normally, the main targets of green investment are companies that develop renewable energy technologies, waste management companies and companies with technology in water efficiency. The screening technique can be negative or positive, and nowadays there are 4 generations of screening, including the so called triple bottom line (sustainability, third generation) and shareholder activism and commitment (fourth generation). An attempt to close the conceptual boundaries of Green Investment it was made by OREL PEREZ (2007), who depicts the universe of Green Finance as entailing "Project finance, ethical-green investment, and environmental reporting. Project finance represents the supply side of the market, while green investment represents the demand side. Environmental reporting is part of the institutional framework that facilitates the work of the financial market".

## Mutual Funds

The structures of the financial market are innumerable and complex. One of the most important nexus for the operation of this market are the financial intermediaries, that can be characterized as enterprises that are in the business of buying and selling financial assets. According to JAMES TOBIN the economic functions of these financial intermediaries are the following: i) convenience of denomination; ii) risk pooling, reduction and allocation; iii) maturity shifting; and iv) turn of illiquid assets into liquid liabilities<sup>45</sup>.

From this universe of financial intermediaries, the role played by funds is very important, mainly in the relation between expected return and risk, in the context of the Modern Portfolio Theory. Introduced by HARRY MARKOVITZ, the theory predicts that normally investors are risk averse and when faced with two different assets with the same potential profitability but with different types of risk they will tend to choose the less risky one. A investment has two kinds of risk (the risk of the market and of the individual company). Funds are a type of financial intermediary, meaning that their economic function is to pool investment of single investors in order to reduce transaction costs that an individual would face in the financial market. It's a framework whose core function is to develop a risk-sharing structure, reaping the benefits of economies of scale. Other examples of financial intermediaries include insurance companies, commercial banks and pension plans<sup>46</sup>.

More specifically, mutual funds are "investment companies that invest pools of monies in a host of investment options<sup>47</sup>". Being a company, a mutual fund naturally has a board of directors and shareholders. There is also the figure of the fund manager/investor adviser, that is the person who guides de investment process of the fund. Normally, a fund has three kinds of shared expenses; advisory fees, transfer agency fee and a 12b-1 fee (distributor fees). The fee that matters for this paper is the advisory fee, whose beneficiary is the fund manager. Just like any other investment alternative, funds have some advantages and disadvantages. According to ROBERT PONZEN, compared to direct investment, the advantages are related to securities expertise, administrative costs, and convenience. On the other hand, the use of financial intermediaries incurs the payment of advisory fees, eventual poor performance and the potential conflicts of interests involved in any fiduciary relationship<sup>48</sup>. The main incentives (rationales) to single investors in a fund context are i) diversification of investments; (ii) professional asset management and (iii) redemption upon demand (liquidity), according to BIRDTISTLE<sup>49</sup>.

The aim of funds are generally of triple nature (stocks, bonds, market money). The fund portfolio can be mixed, targeted towards a certain industry sector or an specific class of assets. Another important characteristic is that mutual funds can be open or close ended. An open ended fund is a fund that allows individuals to buy and sell shares each day of this mutual fund at the closing share value of the fund (the net asset value). On the other hand, a close end fund (whose counterpart in the UK is the investment trust) establishes a limit on the number of shares that can be issued.

Already established the nature of funds, mainly the mutual funds, it's necessary to access the main instruments used in the financial market in order to pool investments in the green investment area. According to VAN BELLEGEN and FRANCES DECLERCK nowadays the financial market has already passed through five phases dealing with the environment, meaning now that environment issues have already been internalized in the business: i) the indifference phase; ii) the defensive phase, iii) the preventive phase, iv)

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<sup>45</sup> TOBIN (1998:344-345).

<sup>46</sup> A classic work about financial intermediaries is the one by GOLDSMITH (1958).

<sup>47</sup> IPPOLITO (1998:831).

<sup>48</sup> POZEN (1999: 4).

<sup>49</sup> BIRDTISTLE (2006:1414-1417).

the innovative phase; and the v) sustainability phase<sup>50</sup>. Following this, the four kinds of funds that will be analyzed here are Green Private Equity/Venture Capital Funds; Green Mutual Funds; Green Pension Funds; and Green Hedge Funds. All those financial instruments, besides its own idiosyncrasies, e.g. operational framework, management structure, investment strategy, remuneration scheme and target customers, have as their core objective to increase their share value in the context of green investment.

### Green Private/Equity Funds

Venture capital, in the words of ROBERT H. SMITH, “is risk finance provided to enterprises which, for a variety of reasons are unable to raise such finance in the public or quoted capital markets<sup>51</sup>”. Normally companies ask for venture capital because of their size, stage of development, degree of leverage or the nature of the company and business<sup>52</sup>. Finance of these companies is made in form of equity<sup>53</sup>.

Venture capital, in the form of private equity, is widely used in the energy sector, that is one of the options for the green investor, according to our proposed concept. It’s a industry sector that is constantly growing, considering the sustainable energy approach and also because of government incentives for entrepreneurs in the area. This kind of investment helps economic growth and industrial restructuring. The majority of venture capital investors, nowadays, are big institutional investors, like pension funds that have guidelines dealing with investment in environmental responsible companies, for example. From this standpoint, it’s possible to deduct that financial instruments are increasingly interconnected and there is a complex network of relationships and interplay among the actors of this system.

### Green Mutual Funds

The expression green mutual funds, is, in a certain way, new, but has been already mentioned. Organization for Economic Cooperation and Development, in one of its reports, wrote expressly about *green funds*<sup>54</sup>. Investment companies are already marketing green mutual funds and even lists of the best green funds are available.<sup>55</sup> Green mutual funds have in their investment portfolios companies that meet the concept of green investment informed on this paper. Due to the diversity of market and competition among mutual fund companies, funds can present different approaches (focus in industry sector or in eco-friendly practices, e.g.). Investor advisers already established some guidelines and behavioral patterns to investors that want to invest in the green area.

### Green Pension Funds

Pension funds can be defined as “financial intermediaries which collect and invest funds on a pooled basis for eventual repayment to members in the form of pensions”<sup>56</sup>. These funds are considered very important institutional investors, considering the high percentage of assets and stakes of companies that they have in their portfolios, due to the high amount of money its shareholders (in a collective sense) have. In UK, for example, they are adopting green investment alternatives<sup>57</sup>, what can influence the way target companies behave in their relationship with the environment. The movement towards green investment in Pension Funds and government regulation is spread all over Europe<sup>58</sup>.

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<sup>50</sup> VAN BELLEGEN and DECLERK (2004:2).

<sup>51</sup> SMITH (1998:761)

<sup>52</sup> *Idem*.

<sup>53</sup> This form of equity is established through ordinary shares or quasi-ordinary shares.

<sup>54</sup> BILLER, Dan; SERMANN, Karoline. Financing Biodiversity. First Draft. Draft background paper for discussion at session V.2 of the OECD Global Forum on Sustainable Development: Conference on Financing Environmental Dimension of Sustainable Development OECD, Paris, 24-26 April 2002

<sup>55</sup> The pioneer fund to use screening criteria was Pax World Fund, in 1972. Nowadays, some important funds are the following: Portfolio 21, Neuberger Berman Socially Responsive, TIAA-CREF Social Choice Equity Retail, Winslow Green Growth and New Alternatives.

<sup>56</sup> DAVIS (1994:127).

<sup>57</sup> MANGIERO (2008).

<sup>58</sup> HORST, ZHANG, and RENEBOOG (2007:5-6)

## Green Hedge Funds

According to GREGORY CONNOR, hedging is the “purchasing of an asset or portfolio of assets in order to insure against wealth fluctuations from other sources. A hedge portfolio is any asset or collection of assets purchased by one or more agents for hedging. A grain dealer may hedge against losses on an inventory of grain by selling grain futures; a Middle Eastern businessman may hedge against political turmoil (and the resulting losses) by buying gold; a pension fund may hedge against capital losses on its equity portfolio by buying stock index put options”<sup>59</sup>. Self denominated green hedge funds already exist. A green hedge fund directory, covering the areas of carbon, renewable energy, clean technologies, weather derivatives and forestry was launched recently<sup>60</sup>.

## Review of the Literature on Mutual Funds

Green investment is relatively a young alternative compared to other investment strategies, hence most of the studies made on the subject are in the form of articles presented in reviews and in financial and economic magazines. There isn't yet a wide and complete literature on green financial instruments. In reality this happens because of the lack of a clear cut concept of green investment, as was addressed in the first chapter of the present paper. Nevertheless, following the dynamic speed of the market, the flow of information is already well spread, but not coordinated and standardized.

In the case of standard mutual funds and SRI funds, there is more material. FLORENCIO LOPES DE SILANES<sup>61</sup> refers that the academic studies in the area of mutual funds are related to 3 areas, mainly. According to him, the first group deals with mutual fund size and performance, the second group with the connection between governance structures and performance and the third one about issues related to cross border framework.

In general the academic works developed on this area can be qualitative (dealing with concepts of CSR, SRI, attempts to establish factors to assess environmental performance and to guide environmental investing, mostly written by law and business management scholars), quantitative (presenting models of investor behavior and environmental disclosure, analyzing the performance of ethical funds, trying to establish the difference among social responsible and non social responsible investors, an approach made mainly by economists) and works presenting both a quantitative and qualitative approach (trying to first establish a clear definition of a certain issue and after applying models to prove or not the assumptions made).

## Available Empirical Data

From all the universe of academic papers, the data that matters for this paper is the one related to (i) regulation and (ii) optimal contracting (remuneration schemes and other covenants) and how they interact with the parties involved in order to reduce the Agency Problem in regard to the green investment area.

Considering that the basic will of the investor is return, performance has a major role here. The first point, is that the screening technique used in this kind of investments doesn't present a clear disadvantage compared to conventional assets in terms of performance, according to SCHRÖDER<sup>62</sup>. BARNETT and SALOMON<sup>63</sup> in a study covering 61 SRI mutual funds during the period of 1972-2000 found a curvilinear relationship between Social Responsibility and Financial Performance (in a first moment, the screening technique of these funds can make financial returns decline, but afterwards it increases, as the number of screens goes toward a maximum. Finally, a study made by HORST, ZHANG and RENEBOOG<sup>64</sup>, that covered “nearly all mutual funds of the world”. The results varies from country to country. European and Asia-Pacific SRI mutual funds underperform domestic benchmark portfolios by around 5%. On the other hand, SRI mutual funds that are located in UK and US does not present a important underperformance in relation to their benchmarks. Social and governance screening, for example, increase risk-adjusted returns.

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<sup>59</sup> CONNOR (1998: 627)

<sup>60</sup> The wall street green trading summit (2009)

<sup>61</sup> LOPES DE SILANES (2008).

<sup>62</sup> SCHRÖDER (2004).

<sup>63</sup> BARNETT and SALOMON (2006).

<sup>64</sup> HORST, ZHANG and RENEBOOG.(2007b).

In second place, a relevant factor is to analyze if the profile of a green investor is diverse of a regular investor. For example, in the field of private equity, as confirmed by PHALIPPOU and GOTTSCHALG "sometime investors objective may not only be to maximize returns<sup>65</sup>". The investor of social responsible mutual funds, green included, is different from the average investor. A recent study by NILSSON has as its major conclusion that "investors in SRI profiled mutual funds care about both acting in accordance with their SEE values and about receiving a good return<sup>66</sup>". HORST, ZHANG and RENEBOOG concludes that "(...) investors of SRI funds explicitly deviate from the economically rational goal of wealth-maximization. SRI investors are socially conscious and derive non financial utility by holding assets consistent with their ethical and social values. (...) SRI investors still desire to improve their financial utility as they expect positive risk-adjusted returns on their investments<sup>67</sup>."

Besides the literature dealing with return performance and investment styles of fund managers, "the academic literature has devoted surprisingly little attention to the restrictions commonly found in the investment policies that define the contracts between investors and managers<sup>68</sup>." One of the few studies about it is made by ALMAZAN, BROWN, CARLSON and CHAPMAN. After taking in account investment restrictions and the role of monitoring schemes, that are considered to be analogous to covenants, the authors conclude that "differences in the level of investment policy restriction do not affect fund performance in either an economically or statistically significant manner<sup>69</sup>". This evidence would be a sign that mutual funds adopt the necessary set of constraints to create an optimal contract with their investors.

Despite of that, a study by SCHMIDT and WAHRENBURG covering contractual design in the venture capital industry found out that, surprisingly, older fund managers tend to "put less weight on the effects of their actions on future business opportunities<sup>70</sup>", due to already established reputation and the fact to be closet o retirement. If we derive and apply this sort of characteristic to the fund manager of green mutual funds, this can have effects on his effort to apply screenings, one of the basic characteristics of the process of green investing.

## METHODOLOGY

The economic approach to human behavior and its extensions is important and relevant is not a matter of discussion, but the words of GARY BECKER confirm and focus the foundations of this approach. According to him, "the combined assumptions of maximizing behavior, market equilibrium and stable preferences used relentlessly and unflinchingly, form the heart of the economic approach as I see it<sup>71</sup>". Adjusting the focus for Law and Economics, KERKMEESTER<sup>72</sup> gives the following definition in the Encyclopedia of Law and Economics, "Law and economics can be defined as the economic analysis of law, and therefore as the application of the rational choice approach to law. In accordance with the textbook definitions, the term law here refers to statutes, judge-made law, treaties and customary law. However, not only the law itself is studied, but also the way it came into existence and, in particular, its effects".

For JULES COLEMAN, at least 3 distinct activities are in the domain of Law and Economics: analytic law and economics (that can be descriptive or positive) and normative, but all pointed in direction to economic efficiency<sup>73</sup>, most of time a complex concept. The same author observes that when writing within a

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<sup>65</sup> PHALIPPOU and GOTTSCHALG (2005:29).

<sup>66</sup> NILSSON (2008:321)

<sup>67</sup> HORST, ZHANG and RENEBOOG.(2007b:2).

<sup>68</sup> ALMAZAN, BROWN, CARLSON and CHAPMAN (2004:290)

<sup>69</sup> *idem* (2004:291)

<sup>70</sup> SCHMIDT and WAHRENBURG (2003:4). According to the study, young fund manager tend to work more, because need to develop a reputation of efficient asset managers.

<sup>71</sup> BECKER (1976: 5). We must consider that for BECKER (1976:153-168) even the irrational behavior is covered by Economics.

<sup>72</sup> KERKMEESTER (1999:384)

<sup>73</sup> According to COLEMAN (1988:67-68) "Whether the new law and economics is restricted to model theoretic applications or whether instead it is advanced as an explanatory or normative discipline, its central organizing idea is that of economic efficiency. The concept of economic efficiency, however, is complex and widely misunderstood". The author list at least 5 concepts of efficiency: (1) productive efficiency (2) Pareto Optimality (3) Pareto superiority (4) Kaldor-Hicks efficiency (5) Wealth Maximization – the latter based on Posner writings.

background in Law and Economics there are some basic questions that must be in mind<sup>74</sup>. The movement has different origins, because of the intense participation of some schools of thought, namely Chicago Law and Economics, Public Choice Theory, Institutional Law and Economics and Neoinstitutional Law and Economics. The present study will start with a positive methodology and will use the instruments of Law and Economics to adopt a normative method as well, bearing in mind that the approach deals with personal choices<sup>75</sup> of the author, taking in account the existent theory. An interesting approach is given by NICHOLAS L. GEORGAKOPOULOS<sup>76</sup>, in the sense that Law and Economics thinking is based in proposals, consequences and ideals. This basic framework was used on the present paper. The proposal here is the establishment of optimal regulation and contractual clauses in the field of green investment; the consequence of the adoption of this proposals will be the reduction of uncertainty and asymmetric information; the ideal, social welfare maximization.

The present research did not utilized its own econometric models or new concepts to measure the performance<sup>77</sup> of green shares – the academic literature that already exist is detailed and have analyzed a wide set of investment funds, comparing ethical funds to non-ethical ones, for example. The results already found vary from source to source, depending of the age of the fund, the screening style, the benchmarks used, the country and region measured and so on. From now, what we can say is that the flow of money in this kind of investment configure a *signal* that regulation and contracting schemes – sooner or later, in a soft or hard way - will be necessary.

The basic research questions of the present paper were. 1) Is there a specific concept/design for Green Investment and Green Shares? 2) What kind of financial instruments are used in the field of Green Investing? 3) How does the Green Investment Cycle works in the case of Green Mutual Funds? 4) How to solve or minimize the agency problem between a green fund manager/investor adviser and the investor of Green Shares? 5) Is there a necessity of (i) a different governance/regulation framework for green investment or (ii) a different contracting form/clauses in order to reduce the agency problem between the Investor (principal) and the green fund manager (agent)? 6) In case question 5 is answered in a positive way, which kind of actors, structure and region of the world can lead the establishment of this innovative way of addressing the issue of Green Investment? Which steps are necessary in order to implement it?

## FINDINGS AND INTERPRETATION

Green investment can be characterized as an investment (in other words, the participation in the stocks of these firms – “green shares”) in companies within a specific sector that is closely linked with the environment or in companies that adopt environmental oriented practices. It also includes funds and other financial instruments that invest in this kind of area. Investment in green shares of companies that adopt green practices means that those investors are aware of the relationship between the environment and the share value of the company (*i.e.*, the fundamental analysis plays a important role here). Likewise, the investment in companies of the green sector signals that investors want to reap the utility of the potential level of growing of this market, that is somewhat under valuated, because of its initial stage and of the considerable possibilities of its expansion. The side effect, or actually the externality – a positive one in this case – is the collaboration towards a sustainable development track.

The green investment cycle in the area of mutual funds is complex and has a considerable number of actors. In order to simplify, the following agents have a greater role: i) the green investor; ii) the green fund manager; iii) the target companies; iv) the regulatory bodies, like the public stock exchange, the rating agencies, practitioner’s associations, legislative and administrative bodies, etc. From this cycle, some insights can be derived. At first, we can try to identify agency costs between the fund manager (or investor adviser) and the single green investor. In other words, the coordination problem of the actions of the fund

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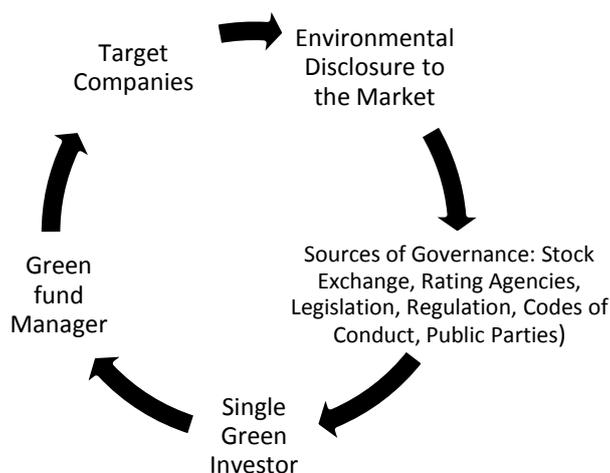
<sup>74</sup> These questions are “(1) what is economic efficiency? (...) (2) Can the rules and principles of any or all of the law be rationalized or subsumed under the economic theory of legislation or adjudication? (...) (3) In what ways must legal rights and duties be assigned and enforced so that the rules that assign and enforce them are efficient? (...) (4) To what extent is efficiency a desirable legal value in particular, and a normatively attractive principle in general?”.COLEMAN (1988:68).

<sup>75</sup> In this sense, see PARISI (2005:33-52).

<sup>76</sup> GEORGAKOPOULOS (2005:11-19).

<sup>77</sup> For performance evaluation methodologies, including CAPM, Multifactor Models, Conditional strategies, and others, see HORST, ZHAN, and RENEBOOG (2004:17-21).

manager in relation to the interest of green investors. The second step of the cycle is the contact (that can be implicit or explicit) of the fund manager (normally a fund with a considerable share of stocks of a certain company or with an insider agent) with the board of the target companies. Fund managers can ask, motivated by the desire of green investors (the first relation established), for environmental disclosure information and/or activities (even beyond legislative and administrative regulations) in order to identify if the company is really into green practices. This apply also for companies that are in specific sectors, for example renewable energy, because even in an environmental oriented business sector there is competition and it is possible to check for environmental practices and *best in class* companies. The third issue that can be identified deals with the level of environmental information disclosure that the target companies must engage in. This topic is related to the signaling effect of showing that the company is into green investment, adopts environmental practices and that complies with legislation. The fourth relationship is the governance aspect – a factor that entails self-regulation, state and global governance. The graph below can depict the green investment cycle:



What must be highlighted is that the main objective of Green Investing is, just like any other kind of investment, return and profits<sup>78</sup>. The investment in Green Shares of companies that adopt green practices means that those investors are aware of the relationship between the environment and the share value of the company (*i.e.*, the fundamental analysis plays a important role here). Likewise, the investment in companies of the green sector signals that investors want to reap the utility of the potential growing of this market, that is somewhat under valuated, because of its seminal stage and the considerable possibilities of expansion<sup>79</sup>. The side effect, or actually the externality – a positive one in this case – is the collaboration towards a sustainable development track.

Besides the agency problems already analyzed, the Green Investment Cycle has a important wing that is related to triple helix interactions; it is the point named “sources of governance”. This point refers to the level of information provided by the actors involved, *i.e.*, the level of knowledge that is disclosed to the involved parties. Among these actors we can include industry, government and university.

Being the “heartland of global innovation” Silicon Valley and its investors were one of the pioneers in green investment. Altogether with California’s government, venture capitalists of the area invested considerable amount of money on the field, and even with the crisis, the levels of investment have already returned to pre

<sup>78</sup> It does not mean, also, that the green investor is completely equal to an average investor.

<sup>79</sup> An example of this opportunity was the increase in the value of stock companies (sometimes even 30% in one day) linked with renewable or alternative energy after the election of Barack Obama, who plans to spend U\$150 billion in the next 10 years in alternative energy. Available in <http://www.alternative-energy-news.info/barack-obama-renewable-energy/>. In the same direction, in Europe the *Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources*, entered into force in 25 June 2009, aims to reach 20% of gross final consumption of renewable energy in the European Community context.

recession levels<sup>80</sup>. In spite of this, the fact is that the green wave must conquer another type of investor, i.e, the regular one. Considering the specific characteristics of the Silicon Valley, specially the interrelationship between Industry, University and State – what configures a typical case of triple helix interaction - the place is the most suitable to implement new measures in order to establish this new trend (be it locally or spreading it worldwide). A possible way to give support is to create Green venture funds pointed to green mutual funds, which can (the former) be established by government, a given industry association or even academic ones (university as entrepreneur), to give support to Green Mutual Funds. It can serve as a start up to, through reputational and deep specific knowledge, to incentivize another actors of the financial sector, including the single green investor. It can cause an spin off effect, with regions of the world competing to receive green investment.

## CONCLUSION

The green investment cycle, in the specific mutual fund area, works in a similar way to usual mutual funds. The green mutual fund is a financial intermediary, pooling investment from single investors, coordinating numerous actors in a single investment strategy, reducing the risks of individual uninformed agents. Accordingly, the basic Principal Agent problem, common in any fiduciary relationship, also exists here, for example, in the case of the green investor and of the green fund manager. In this sense, the same alternatives used to solve agency problems, namely compensation schemes and covenants are also adopted here. Bargaining power, reputation, monitoring and all related factors applied in the mutual fund area have a similar result in the case of green mutual funds. But there are some differences. In the specific case of green mutual funds, the fund managers are naturally more constrained in their investment options than usual funds: the impact of environmental factors and events in this specific area are more sensitive for the share value of these companies and for the investment strategy. In order to increase investment on this field it is necessary to reduce the agency problems and the level of knowledge. Silicon Valley's specific characteristics, added to its reputational image, can help to implement these directives. The present topic is up to date because it connects to the existence of a new paradigm: the entrepreneurial university as a center of knowledge production, as established by HENRY ETZKOWITZ<sup>81</sup>

## POLICY IMPLICATIONS

Considering the unique characteristics of green investment, some normative suggestions, pointed for the reduction of asymmetric information, the protection of investors and the increase of social welfare can be done both in the field of regulation and optimal contracting of green mutual funds. In the case of regulation and legislation, (i) a binding concept of green investment could be implemented, what would protect investors and increase the efficiency of the financial market; in reality, there is already a movement of legislative incentives for green investment, mainly in the sector of renewable energy, but incentives for research could be given by the state; (ii) in regard to Codes of Conduct, the development of a code specially crafted for Green Fund Managers, maybe by an association (considering the economies of scale benefits and the solution of a collective action problem), because they are a professional category of their own, due to different methods of investment and specific customers (green investors); this would reduce the monitoring costs of the investor, in regard to the fund manager activities; (iii) rating agencies that have green investment indexes could implement penalties for companies that adopt green wash practices, like, for example, a temporary suspension from the index; this would *signal* to other companies that partial or distorted disclosure of environmental information can influence directly the share value of the company.

## DIRECTIONS FOR FURTHER RESEARCH

It is necessary more investment in research in the field; this will make the concept of green investment more precise and less asymmetric for investors (and triple helix actors). As a result, new contractual frameworks could be developed. Nevertheless, some normative suggestions to green mutual funds in the field of optimal contracting can be already made: (i) beyond the average clauses that exist in a mutual fund contract, the adjustment of a clear screening technique would reduce transaction costs and drafting costs of contracts. The screening technique should contain also a negative screen related to green wash, that is one of the most relevant factors for the increase of asymmetric information in the financial market; (ii) if performance in the area of green investing is related to the number of screenings (BARNETT and SALOMON - 2006), and if older fund managers (SCHMIDT AND WAHRENBURG - 2003) tend to decrease his level of effort, due to the reputation that they have acquired and increased bargaining power, a

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<sup>80</sup> Information accessed at <http://www.guardian.co.uk/globalcleantech100/silicon-valley-investors>.

<sup>81</sup> ETZKOWITZ, GEBHARDT, TERRA, WEBSTER (2009).

clause establishing a periodical review of the screening technique could mitigate this conflict of interest between the green investor and the green fund manager.

Maybe the analysis using triple helix interactions cannot be sufficient to solve the question regarding green investment; in this case, it can be included an extra helix, or even n-tuple helix<sup>82</sup>, considering the complexity of the issue (public private interactions, the role of the single investor, etc) In spite of this, only more deep research will unveil and solve this seminal but essential issue for mankind.

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<sup>82</sup> LEYESDERDORFF (2010)

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