Green Companies & Economic Performance

Emmanuïl Amygdalas
SID: 3302130022

SCHOOL OF SCIENCE & TECHNOLOGY
A thesis submitted for the degree of
Master of Science (MSc) in Energy Systems

NOVEMBER 2014
THESSALONIKI – GREECE
Green Companies & Economic Performance

Emmanuil Amygdalas

SID: 3302130022

Supervisor: Prof. Dimitris Psychogios
Supervising Committee Members: Assoc. Prof. Name Surname

SCHOOL OF SCIENCE & TECHNOLOGY
A thesis submitted for the degree of

Master of Science (MSc) in Energy Systems

NOVEMBER 2012
THESSALONIKI – GREECE
Abstract

This dissertation was written as a part of the MSc in Energy Systems at the International Hellenic University. It describes the various elements that compose ‘green’ companies as business environmentally friendly entities. How they are defined, their philosophy, the problematic behind their green characteristics, their managerial elements & incentives.

A thorough citation in literature is provided for the financial performance and the tools available for this assessment. The most important analysis tools are extracted for the use of this work. Literature review is also conducted on similar methodological studies of other academics for the purpose of this dissertation.

A sample of 20 green companies is collected from a renowned sustainability index (DJSI North America). This companies are presented and their financial data are been gathered for the scope of the analysis. Empirical results are produced from the analysis of the key financial ratios, in relation with the comparative ratios of S&P 500 index. Finally useful conclusions are been drawn from the analysis of the empirical results.

I would like to thank Mr Dimitris Psychogios, my supervising professor and the people of RobecoSAM Investment Company for their key contribution to my research.

Finally, for this thesis being the last step for the finalization of my Msc project, I would like to offer my deepest thanks to my family for their support, the two honorable professors from my old days in the Technical University of Crete, Mr Dimitrios Emiris and Mr Nikos Matsatsinis for providing their references for me to begin this master and the people of IHU for their always kindest and valuable co-operation.

Emmanuil Amygdalas

November 2014
Contents

ABSTRACT .................................................................................................................. 3

1 INTRODUCTION .................................................................................................... 6

2 CHAPTER 2. PROBLEM DEFINITION .................................................................... 7

3 CHAPTER 3 LITERATURE REVIEW ........................................................................ 11

   3.1 DEFINITIONS OF GREEN COMPANIES ....................................................... 11
   3.2 DRIVERS FOR THE IMPLEMENTATION OF SUSTAINABLE BUSINESS PRACTICES
       OF ENTERPRISES .................................................................................................. 14
   3.3 THE ROLE OF MANAGEMENT AND THE GREEN BUSINESS CONCEPT .......... 18
       3.3.1 Leadership characteristics ......................................................................... 18
       3.3.2 Needs of the leaders .................................................................................. 19
       3.3.3 Management systems for sustainability ...................................................... 20

4 CHAPTER 4 MEASURING FINANCIAL PERFORMANCE ........................................ 23

   4.1 MANAGEMENT’S VIEWPOINT ......................................................................... 25
   4.2 THE LENDER’S VIEWPOINT ........................................................................... 29
       4.2.1 Forecasting financial requirements .............................................................. 30
       4.2.2 Valuation and business performance .......................................................... 33
       4.2.3 Summary .................................................................................................... 34

5 CHAPTER 5 SIMILAR STUDIES ............................................................................. 35

   5.1 SUMMARY ........................................................................................................ 44

6 CHAPTER 6 METHODOLOGY AND DATA DESCRIPTION .................................... 45

   6.1 GREEN COMPANIES ....................................................................................... 48
   6.2 FINANCIAL DATA ............................................................................................. 55

7 CHAPTER 7 EMPIRICAL RESULTS ...................................................................... 57

   7.1 PROFIT MARGIN RATIO ................................................................................. 57
   7.2 RETURN ON EQUITY (ROE) .......................................................................... 59
   7.3 RETURN ON ASSETS (ROA) .............................................................................. 61
7.4 RETURN ON INVESTED CAPITAL (ROIC) ................................................................. 63
7.5 EARNINGS PER SHARE (EPS) ............................................................................. 65

8 CHAPTER 8 CONCLUSIONS AND PROPOSALS FOR FUTURE RESEARCH ................................................................. 68

9 BIBLIOGRAPHY ........................................................................................................ 69

10 APPENDIX A ........................................................................................................... 72

11 APPENDIX B ........................................................................................................... 80
1 Introduction

The rising importance of sustainable development has led corporations all over the world to revise their business procedures and applications for the benefits of preserving the natural environment and provisions for the needs of the future generations. While important these corporate transformations, they are critical to be assessed in ways that do not harm their business purposes as enterprises, that is their financials.

A thorough analysis of the philosophical background behind these changes, should be performed to review them as necessities. While a closer look on the financial performance of these corporations (green companies), that embrace these changes, should be conducted in order to see whether their impact, is positive or negative over the economic picture of these organizations.

For numerous years, quite a lot of studies in the literatures, have been issued to negotiate green and financial performance relationship. Some treat positively this relationship. Others remain more skeptical over the problem. Yet the questions remain and the scope of this study is to enrich this field of research.
2 Chapter 2. Problem Definition

In this chapter there shall be definition of the problem in two major aspects. More specifically, one must recognize if adopting environmental procedures in the business model is good for its finances or if it actually delays the business procedure and produces pale results. Earlier than that, it must be specified whether businesses should participate in the broader scope for a cleaner natural environment.

In 2006 Steve V. Walton, Robert B. Handfield, and Steven A. Melnyk commented on the importance of environmental considerations of businesses. The environment has developed to a serious concern in today’s business. In the 60s and 70s, companies usually considered ecological submissions to be a marginal matter which provoked little discussions at managerial levels. Later on, numerous huge environmental tragedies (e.g., Three Mile Island, Exxon Valdez, Love Canal) confirmed the importance of having a complete ecological strategy prepared. Furthermore it started being obvious that gas emissions from various industries were responsible for the Greenhouse effect, acid rain and other atmospheric phenomena. Also the scientific communities recognized that the disposal of various contaminants or industrial residues in the ground, used in the chemical and manufacturing processes of numerous industries, were in fact responsible for the pollution of the natural ground and underground water streams as well as the ocean.

Up to this point it became quite clear of the great importance of companies participating in the broader goal of sustainable development.

Together with the development of environmental legislations and assessing the above effects, companies started to take into consideration their broader actions over natural environment. Was it safe to do business as usual anymore? Harming the environment as a byproduct of works was a good business in the long run? And what about people and long term profitability? Businesses began asking these questions and the resulting answers pointed to another way.

---

Eventually a large number of companies slowly entered a new era, where it was not detrimental anymore to engage actions that improved the natural environment together with actions aiming at higher profit. On the contrary, it started, at least from the marketing view, seeming that combining eco-friendly and traditional procedures could be financially beneficial for the company.

And here lies the great importance of the second aspect. Implementing seemingly expensive and vague green procedures and activities in the traditional business model of a company beyond compliance with legislation, re-engineering the business where necessary, will provide substantial benefits for the company in the end? Will the people of the company embrace the new techniques and a novel way of thinking? Or these efforts will just stall them from their concentration in the business goal and decrease their efficiency in their work.

*Implications*

Adopting green procedures and techniques affects greatly many areas of the business model. These areas include both internal and external relationships of the company and in many levels.

First of all the management must adopt new ways of thinking, of doing business. Everything starts from the management. Management has to recognize the needs for the times and adjust accordingly. It goes without saying’ the natural environment is in danger, and sustainable development becomes even more apparent as time passes. The needs of the current era require environmental behavior from the companies. Therefore management has to be educated regarding green procedures and technologies and persuaded by their importance. Management has to declare new environmental systems, similar to total quality systems, for use from its employees. Finally management has also to decide for the purchase and implementation of new eco-friendly technical systems.

Lower level executives, employees and workers will have to adapt to the new policies regarding. As will be seen later, usually employees feel good about the new changes, embrace them and proceed with new responsibilities, although they may be assigned with extra working hours. At this level, a possible negative outcome may be the increased bureaucracy that results out of the implementation of new additional systems.
The new or modified products of the company when exiting the facilities carry the environmental stamp of the company, the new policy. The final products encompass all the environmental philosophy of the company, if any. They are actually the picture of the business; they instill the various values of the companies including the environmental ones. The impact on the products is immense.

The people, the clients, the customers, receive the products and services of the company. They are the final recipients. They discover the new, upgraded look of the company. Most of the times, if not all, they embrace the new green policies by buying more on the products and services. Sometimes they buy on new rumors only. The impact on them is the most important.

Public sector is affected also. The state awards businesses with environmental concerns, by providing benefits through subsidizations and generally treats them quite better through the various public procedures, as they considered to contribute to the common public interest. The public sector also constantly develops new legislation regarding environmental protection from companies.

Technology and science is greatly affected also. New environmental requirements provide incentives to develop new technologies that do not harm or burden the natural environment. These technologies to be developed, demand efforts from R&D departments of technology companies, universities and research centers. This process produces more work and induces initiatives from the private sector.

One can see that a variety of implications is associated with the environmental & economic performance relationship as well as the general concept of sustainable development. These implications mingle with each other, interconnect and generate new positive effects.

*Applications*

The problem as described above applies to all organizations both public and private. Furthermore it is applied to everyday decisions one makes and how these decisions affect both financially and environmentally peoples life.

With reference to the public sector, new environmental legislation is issued pretty frequently. Academics and scientists observe the scientific data and push politicians through the correct mechanisms and media, to vote for new laws and legislations.
New legislations and procedures are then published for organizations and companies to be updated and comply.

For the private sector a description has already been provided earlier. All type of companies, no difference whether is heavy industry, high tech, and production of goods or services are called nowadays to provide an environmental footprint. This footprint must satisfy the businesses’ needs for profits. The efforts start from the managerial level and comes down to last employee. The result of these can be seen both in products/services as well to business procedures of the companies. The results award the companies accordingly and this can be viewed in their balance sheet and cash flow statements.

*Summary*

In this chapter, there was made a serious introduction to the problematic as described its various implications and applications. In the next chapter there shall be a definition the so called “green companies” by viewing the works of various scholars.
3 Chapter 3 Literature review

3.1 Definitions of green companies

Generally defined Green companies are considered as these financial organizations that damage the environment in the least way (or not damage at all), by their activities.

In recent years, there has been an increasing amount of publications covering the definition of a green company or sustainable business. For example, a thorough definition of eco-friendly companies, describes them as enterprises that have minimal negative effect on the global or local environment, community, society, or economy—businesses that strive to meet these three key above factors. Frequently, these sustainable businesses have continuous environmental and human rights policies. Practically, businesses are considered as green, if they meet the following four (4) principles ² (Cooney, S., 2009).

1. They include principles of sustainability into every of its business decisions.
2. They supply friendly products or services to the environment, that replace demand for traditional non-green products and/or services.
3. They are generally greener than traditional competition.
4. They have established a permanent dedication to environmental principles through their business operations.

United Nations in their national assembly of 1987, provide another important definition that characterizes sustainable business. That is, any business that uses environmentally friendly actions, to make sure that all its processes, products-services and/or manufacturing procedures sufficiently deal with the existing environmental interests, while being profitable. As the definition of “sustainable development” clearly defines, it is a business that “meets the needs of the present world without compromising the ability of the future generations to meet their own needs.”³ Rennie (2008) suggests that it is the process of making possible to design products that will exploit the exist-

---

ing environmental state and how efficiently company’s products carry out with renewable resources\textsuperscript{4}

UN also emphasized “that sustainability is a three-legged stool of people, planet, and profit”\textsuperscript{3}In 2008, Galvao described sustainable businesses as those that, inside the supply chain, strive to balance all three above authorities, through the triple-bottom-line concept, using sustainable development and sustainable allocation to affect the environment, business expansion, and the society.\textsuperscript{56}

Rennie (2008) states that everyone influences the sustainability of the marketplace and the world somehow. Sustainable development inside a company can generate value for clients, stakeholders, and the environment. A sustainable business should match customer needs while, at the same time, respecting the environment.\textsuperscript{7}

It must be noted, that sustainability is frequently thought as the same as corporate social responsibility (CSR), though the two are not identical. As Bansal and Des Jardine (2014) comment, ”time “ is the critical notion that differentiates sustainability from CSR and other similar conceptions. While ethics, morality, and other standards go eventually through CSR, sustainability is the one thing that obligates companies to make temporary settlements in their procedures, to act immediately in order to safeguard the continuous generation of equity.\textsuperscript{8}

Caprotti (2012) states that green business is used to be seen as a possible mediator between economy and environment, and if flourishes, it would provide a diversified economy, although it has a small effect in reducing atmospheric CO2 levels. The characterization of "green jobs" is vague, but it is generally approved that these jobs, the outcome of green business, should be associated to clean energy projects, and therefore contribute to the reduction of greenhouse gases. These companies can be

\textsuperscript{6}Galvao, A. “Mind Your Own Business, Why sustainable operations must be everyone’s chief concern.” APICS Magazine, Vol. 18, no. 5
seen as producers not only of "green energy", but as those of innovative "materialities" that are creations of the know-how, these firms develop and deploy.  

**The concept of sustainable enterprises**

ILO of Geneva (2007) emphasizes on the importance of enterprise as the main carrier of growth and employment. All enterprises – from very small enterprises, to small, medium and large sized companies – are the main source of economic development and jobs creation. They are at the center of economy and growth almost everywhere. Growth arrives mostly by the creativity and hard work of businesses, men and their workers. All enterprises are creative, they invest and create jobs and wages to produce financial gains. Although their creation of jobs differs from one country to another, generally, private companies create most of the employment, generating opportunities for people to gain knowledge, to put into use their skills and talents, and to become better in their lives. Companies supply goods and services required by all people, from consumer goods all the way to health care, food and housing. Private companies are most of the times the main source of tax revenues and so typically comprise the basis on which the public sectors in the areas of health, education and other services ease. No one can dispute that enterprises are major pillars to all financial environments. Entrepreneurship and enterprise are vital stimulants that bring about change and progress by ensuring that economies remain dynamic, innovative and competitive.

The concept of sustainable enterprise is related to the general approach to sustainable development, originally enunciated in the Brundtland Report, as “forms of progress that meet the needs of the present without compromising the ability of future generations to meet their needs”. So the main concept is based on the standard that decisions at every level in society, should be taken with respect to their possible environmental results. In this mindset, sustainable development growth – based on biodiversi-
ty, the restraint of environmentally harmful activities and the replenishment of renewable resources.

3.2 Drivers for the implementation of sustainable business practices of enterprises.

Referring to Tzschentke (2004), Miller and Twining-Ward (2005), Marita Raderbauer (2012) states that the moral obligation or pure desire to offer to society could be the reason for choosing sustainable business practices for a number of businesses, but for many of them, the reason for going green and the benefits related to these practices bind the profit-making interests of business to the goals of society. We rephrase this view by saying that moral obligation or pure desire to contribute to society should be the reason.

Cost reduction. According to Landrum and Edwards, (2009); Bohdanowicz et al., (2004); Hobson and Essex, (2001); Hitchcock and Willard, (2009); Swarbrooke, (1999), Tzschentke et al. (2004), in her work Raderbauer (2012) identifies utilities cost decrease as the most cited driver of going green. It is the major reason behind environmental schemes. Particularly the increasing costs for water, energy and the disposal wastes, direct many companies to search for alternative solutions. Such operational procedures are for instance recycling systems, the use of recycled materials, the installation of water-saving devices, and the use of low energy light bulbs, general energy-conservation actions such as insulating or the use solar-powered water heating systems. Quoting (Swarbrooke, 1999), Raderbauer 2012, describes these ini-

---

atives as they focus entirely on the environmental aspect of green practices. Unfortunately there is a shortage of literature and research regarding cost reduction potential related to the socio-cultural and economic aspect of going green.

Summing up the above, the increasing cost of resources and the risk of supplies, have become compulsory reasons for companies to seek alternative resources for their production. Many times businesses choose more sustainable alternatives or implement procedures that can decrease the total resources used and thereby costs. (Norden, 2012). The ideal business situation is where companies have set onward processes to decrease costs and generate new revenue flows by altering or increasing their focal point, to source efficiently from excess resources, create recyclable products, attach new services to products or make recycle mechanisms for the reuse of products or their parts. These are examples of spherical and holistic enterprise approaches, where the used wastes are treated as resources and products are made, sold and supported as restorative.

Public relations: Based in the studies of Hitchcock and Willard (2009); Landrum and Edwards (2009); Swarbrooke (1999), Kirk’s (1998), in her study Marita Raderbauer (2012) illustrates how these green practices affect positively public relations. Green business practices can derive benefits to an enterprise in terms of positive public relations and enhanced image with the shareholders and the local society. These benefits can distinguish the company from its opponents and can be the cause of competitive advantages and opportunities for new markets. For example she describes in Kirk’s (1998) findings, how public relation benefits gained nearly all positive ratings regarding attitude, coming with ‘Improved relation with the local community’ and ‘Marketing’. The study shows remarkable relations with the hotel sector characteristics. Big hotels with a rating from three (3) to five(5) stars and chain type hotels are more probably to gain good public relation benefits (quoting Kirk, 1998) than the small, two (2) star rated and standalone hotels.

Employee satisfaction: Again Radenbauer (2012) quoting Swarbrooke, (1999); Baum,(2006) and Butler (2008), describes how employee satisfaction is benefited.
Through green personnel management, staff is more probably to think that is sufficiently rewarded, appreciated, proud of their job and get self-confident. The quality of services and also health and productivity are more likely to get better throughout evolving sustainable and business procedures. Achieving sustainability demands a constructive transformation in business culture. In this framework, culture may be thought as the unseen inspiration of people’s actions throughout organizations.

Cultural thinking and actions have to concise with the notion and principles of green business practices to produce successful results (Radebauer 2012, Doppelt, 2003; Schein, 2009). Green personnel management and a green business culture will assist the firm to draw and hold the best people, an effort which at the moment is at a serious crisis in some industries. (Radebauer 2012, Hitchcock and Willard, 2009; Swarbrooke, 1999).

Consumer demand: Of the most significant drivers for businesses to start a green model innovation, is emerging consumer understanding for sustainability and environment. (Nordec Report, 2012) Customers more and more expect firms to act with responsibility and produce green products and services, and these customers are even more prepared to pay for these products and services.

Consumer demand is the most contentious advantage of green business practices. Green and social interests more and more weigh on customer behavior, yet for now it is still doubtful if an environmental concern of consumers has reached some industries like tourism. (Radenbauer 2012, Dodds and Joppe, 2005; Hjalager, 2000; Miller and Twining-Ward, 2005).

Finally another key driver is the chance for companies to distinguish their products and services and thus generate a competitive advantage going greener and more sustainable than their opponents (Nordec Report, 2012)

---

Barriers adopting green business practices for enterprises.

Companies may face obstacles adopting of green business practices like uncontrollable externalities, for example public policies or the feelings of stakeholders and their insensitivity. But also the company may be limited from within. The major barriers for adopting ‘green’ business practices presented are involved costs, complexity of the concept and lack of information and support (Radebauer 2012, Swarbrooke, 1999; Berry and Ladkin, 1997; Hobson and Essex, 2001; Kirk, 1998; Bohdanowicz and Martinac, 2003).

Costs: A major worry of all companies is the costs involved when putting into practice eco-friendly business practices. Many are worried that going towards more ‘green’ business practices is too expensive (Radebauer 2012, Bohdanowicz and Martinac, 2003; Butler, 2008). It is a known fact that initial energy-saving or renewable energy were costly and fairly ineffective. Yet today’s technology has advanced, for example in the buildings sector and buildings are designed in accordance to LEED standards (Leadership in Energy and Environmental Design). Now they are not costly to function, than conventional structures (Radebauer 2012, Butler, 2008). While this notion submits to new building structures, new actions in established buildings, may too offer eco-efficiency and thus cost-saving benefits. Nevertheless, once initial actions have been made, environmental problems may occur that need new investments which in turn, cannot offer financial returns (Radebauer 2012, Tilley, 2000).

Complexity of notion: This is another problem that has to do with the meaning of sustainability and ‘green’ business practices. The vagueness in these definitions makes the whole concept sometimes hard to comprehend and difficult to convert into significant acts and procedures (Radebauer 2012, Berry and Ladkin, 1997; Horobin and Long, 1996).

Information and support: For businesses to overcome the difficulties about the complexity of sustainability, the government needs to provide information and support. Yet, Radebauer 2012 quoting Sloan et al. (2003) comments that government cannot effectively communicate environmental worries. Numerous other authors reflect the same worries. Also when she is referring to Berry and Ladkin’s (1997), conclusions show that the responsibilities of the people for the advance and governance of infrastructure and its rules, were not comprehended enough and thus public sector had to
step-in as a coordinator. (Radebauer, 2012, Horobin and Long, 1996; Berry and Ladkin, 1997; Dewhurst and Thomas, 2003). This again demonstrates how important is for the all stakeholders to involve and participate in sustainable development procedures. But how leadership should take action in ‘green’ practices is something that will be seen further below.

3.3 The role of management and the green business concept.

It goes without saying that implementation of eco-friendly methodologies and procedures inside enterprises, is a task that requires special efforts from the side of management of the company.

3.3.1 Leadership characteristics

Pat Hughes and Kathleen Hosfeld of the Center for Ethical Leadership, issued a study in 2005, resulting in a variety of characteristics, for the management of a ‘green’ company, to impose and sustain environmentally friendly actions, throughout its business cycle.  

More specifically a numbers of interviews were carried out by the Center towards leaders of various ‘green’ companies, to discover their specific administrative features for guiding sustainability through their organizations.

Five (5) major axes of leadership thinking are found in their research 1) being zealous and vision able, 2) organized thoughts within an extended timeframe, 3) encourage a systematically arranged environment of participants, 4)forming an enthusiasm for employees to educate, and 5) educate people, as well as the competitors.

Leaders for changing their organizations towards sustainability, reveal these character features.

1. They are imaginative and zealous about ‘green’ issues; vision and passion must arrive from upper administration for ‘green’ viability to sustain.

---

25 Pat Hughes, Kathleen Hosfeld (2005), “The Leadership of sustainability” Center for Ethical Leadership” p.15
2. Unconventionally thinking, they observe collaboration or influence potential in affairs all the way through the business, and receive an extended time view of the paybacks of change.

3. Grasp education and bring in new results and approaches

4. They move culture away from hierarchal decision-making, all the way to an environment of mutual participation, where ‘green’ culture and other significant initiatives are daily tasks for every employee.

5. Free education about sustainability with customers and opponents that do not put aside information for their own favor.

3.3.2 Needs of the leaders

In their study Pat Hughes and Kathleen Hosfeld (2005), discuss below how leaders have their own demands in order to carry forward the implementation of ‘green’ practices.

A number of these practices are company-connected, like case studies or a relevant enterprise model, whilst numerous others mirror the need for personal strength as they get on the dangerous, lonesome, demanding work of management and organization alteration, as they say. These are.

Support, not disapproval. Managers speak loudly about support from public sector officers, business associates, the public, and customers. All these must think of the risks they take and the values they try to add in into their business. These leaders are aware of the fact that frequently when they share their vision, people expect from them to be just right, otherwise they get suspicious about them

Networks of associates. A number of leaders of large corporations have the time luxury to travel, connect with their peers and learn. Yet smaller business owners do not have the time, yet entitled of the information. Managers require time to discuss different approaches and knowledge gained with each other in concise, effective ways. Often business leaders are simply looking from where to start, and how to avoid regular mistakes. This goal can be achieved through various entrepreneurial events in forums.

Business improvement consultancy. A large number of the managers interviewed from C.E.L do not even own and official business or management certificate. While trying hard to grow their business, at the same time they develop viability for gainful ‘green’
procedures. During this effort, numerous leaders look for counselors who are able to guide them to create eco-friendly business strategies.

**Applicable case studies.** Applicable models required for employing sustainability, further than recognized food and consumer goods cases seen in the media. These studies are needed both for service and information businesses, and small businesses to gain knowledge on the matter. Managers require real cases and procedures to proceed.

**Education schemes.** Managers need to socialize with likeminded peers and publish their ideas over sustainability. Running a business is time consuming itself, plus trying to establish ‘green’ practices over the company. These two areas do not allow enough time to search for associates who share the same ‘green’ visions. Ready to use information platforms or social networks could do the trick for them (Pat Hughes, Kathleen Hosfeld, 2005). What is the core nature of management systems that leaders must use in order to promote sustainability inside their businesses, is something that will be discussed next.

### 3.3.3 Management systems for sustainability

In 1992 International Institute of Sustainable Development published a book regarding business strategies for sustainability. According to the authors, the whole idea of ‘green’ development has to be integrated within the procedures and practices of an enterprise, if it is to pursue ‘green’ development principles. No new management methods need to be invented; on the contrary, it needs new business orientations and broad enhancements to already applied systems, practices and procedures of the company.\(^{26}\)

Two main areas of the management system to be altered are a greater accountability to non-traditional stakeholders and a continuous improvement of reporting practices.

In order for these two to be achieved, the I.I.S.D. recognizes the following seven (7) steps in the management level, for adapting successfully to sustainable development principles.

---

Carry out a stakeholder analysis. A stakeholder analysis is necessary to recognize all the parties engage by the enterprise’s operations. It promotes the matters, worries and data requirements of the stakeholders regarding company’s ‘green’ development acts. Recognizing the parties with crucial interests in a company is a core element of the sustainable development notion, and guides to greater business responsibility. The key for that matter is to examine how company’s procedures have an effect on each group of stakeholders. Is there a positive or a negative effect on the desires and hopes that these groups have? This should define both current and future requirements, in order to confine the sustainable development notion.(IISD,1992)

Introduce ‘green’ procedures and goals. The next goal for management is to define the basic principles the company anticipates its employees to follow regarding ‘green’ development, and to set objectives for the company’s performance. Administration must include shareholders expectations into an extensive policy statement that articulates the organization’s mission referencing ‘green’ development. This policy statement will lead the preparation procedure and present principles towards which administration, staff and other groups like suppliers are likely to pursue. It is essential that ‘green’ objectives must be clear, to the point and, when possible, quantifiable. Setting up quantifiable objectives is crucial, if administration and other parties are to evaluate if their business actions reached the established goals.(IISD,1992)

Plan and perform implementation. According to the authors of the Institute, it is essential to design a strategy for implementing governance system adjustments required to achieve ‘green’ development objectives. The company’s organization chart must then be re-evaluated to determine the responsible executive for leading ‘green’ objectives.(IISD,1992)

Develop an encouraging business way of thinking. To ascertain that the enterprise and its stuff support ‘green’ policies, the proper corporate way of thinking is necessary. During this process many companies experience an organizational restitution. Managers require changing their attitudes. Participating employees generate practical ideas, and get enthusiastic for the program. Both the majority of clients and company’s people appreciate belonging to a company that is socially responsible in its activities.(IISD,1992)
Develop procedures of measuring and principles of performance. Adopting ‘green’ objectives, and preparing of performance reports, involves using the appropriate ways of performance measurements. These performance measures will be subjective to the organization’s eco-friendly objectives, and by publicly established standards. (IISD, 1992)

Prepare reports. ‘Green’ companies should develop suitable reports for administration and shareholders, illustrating the organization’s sustainable development goals and its performance achieving them.

Management uses these reports to determine performance, decide and supervise the execution of its policies and plans. Other parties such as stakeholders, banks, employees and clients use outside corporate reports to estimate company’s performance, and to hold the management responsible for accomplishing financial, social and environmental goals. (IISD, 1992)

Improve internal process control. Finally according to the IISD (1992), it is essential for ‘green’ companies to develop constantly mechanisms for helping upper management to ensure that eco-friendly policies are applied. Observing objectives are met is considered as key element of the managerial procedures. Most of the times, it is well connected to the creation of reports. Of major importance, when applying a supposedly effective management system, is if the administration supervises constantly its operations and outputs.
4 Chapter 4 Measuring financial performance

In this chapter there shall be an exploration of financial performance of companies, as the most significant outlook, to measure the value that companies represent in today’s markets.

Investopedia defines 'Financial Performance' as “a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues.” This expression is also used as a broad measure of a company's general fiscal condition, for a predetermined time period and may be also used to evaluate related firms in the same industry or to even contrast industries or sectors together. (Investopedia, 2014)

Through many ways someone can determine financial performance, yet all procedures should be considered together. Objects like operating revenues, operating incomes or cash flows and total unit sales can be employed. Furthermore, if someone wishes to look deeper into financial statements, could search for margin growth rates or declining debts. (Investopedia, 2014)

It goes without saying, that in order to measure financial performance of companies, one must delve deep into the field of financial analysis and later on to proceed in tools and techniques of financial valuation. The last is strongly bonded with financial analysis and one cannot consider them separately in order to measure successfully financial performance of a particular organization.

Erich A. Helfert (2001) describes thoroughly all financial analysis tools and techniques. Yet he underlines financial analysis as a practice to be approached differently, depending one’s particular interest in the performance of a company. More specifically different teams have different interests over the business performance, so they cherish different views. These views are: the Management’s viewpoint, the Owner’s viewpoint and finally the Lender’s viewpoint. Every team uses different tools to measure performance, according their own individual interests for creating Value.

---

27 Search term “Financial Performance” Investopedia site, 2014
In this chapter there will be citation of tools and techniques to measure financial performance based in this differentiation.

The same author states that the basic mission and of course of financial analysis can be found in developing and distributing a rationally constant and expressive amount of information and relations that will back the decision making procedure for this goal of value creation. If it is accomplished successfully, the selected contexts and tools should allow both analysts and managers to evaluate the financial settlements involved in every investment decision, funding option, and operative efficiency, and assist them to define and evaluate the firms’ financial performance, prospects, and value. (Helfert, 2001)

As it’s generally established, all financial analysis tools are employed on four basic economic statements. These are the Balance Sheet, the Income Statement, the Cash Flow Statement and the Statement of Changes in Shareholders’ Equity. It is not for the purpose of this work to analyze further on these statements. Yet it is sufficient to say, that every financial organization issues them regularly and every element in these statements, is vital for the successful application of financial analysis and valuation. Successful application of financial analysis and financial valuation leads to successful decision making, for all teams involved with running the company.

<table>
<thead>
<tr>
<th>Management</th>
<th>Owners</th>
<th>Lenders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operational Analysis</strong></td>
<td><strong>Investment Return</strong></td>
<td><strong>Liquidity</strong></td>
</tr>
<tr>
<td>Gross margin</td>
<td>Return on total net worth</td>
<td>Current ratio</td>
</tr>
<tr>
<td>Profit margin</td>
<td>Return on common equity</td>
<td>Acid test</td>
</tr>
<tr>
<td>EBIT; EBITDA</td>
<td>Earnings per share</td>
<td>Quick sale value</td>
</tr>
<tr>
<td>NOPAT</td>
<td>Cash flow per share</td>
<td></td>
</tr>
<tr>
<td>Operating expense analysis</td>
<td>Share price appreciation</td>
<td></td>
</tr>
<tr>
<td>Contribution analysis</td>
<td>Total shareholder return</td>
<td></td>
</tr>
<tr>
<td>Operating leverage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparative analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resource Management</strong></td>
<td><strong>Disposition of Earnings</strong></td>
<td><strong>Financial Leverage</strong></td>
</tr>
<tr>
<td>Asset turnover</td>
<td>Dividends per share</td>
<td>Debt to assets</td>
</tr>
<tr>
<td>Working capital management</td>
<td>Dividend yield</td>
<td>Debt to capitalization</td>
</tr>
<tr>
<td>• Inventory turnover</td>
<td>Payout/retention of earnings</td>
<td>Debt to equity</td>
</tr>
<tr>
<td>• Accounts receivable patterns</td>
<td>Dividend coverage</td>
<td></td>
</tr>
<tr>
<td>• Accounts payable patterns</td>
<td>Dividends to assets</td>
<td></td>
</tr>
<tr>
<td>Human resource effectiveness</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Profitability</strong></td>
<td><strong>Market Performance</strong></td>
<td><strong>Debt Service</strong></td>
</tr>
<tr>
<td>Return on assets (after taxes)</td>
<td>Price/earnings ratio</td>
<td>Interest coverage</td>
</tr>
<tr>
<td>Return before interest and tax</td>
<td>Cash flow multiples</td>
<td>Burden coverage</td>
</tr>
<tr>
<td>Return on current value basis</td>
<td>Market to book value</td>
<td>Fixed changes coverage</td>
</tr>
<tr>
<td>EVA and economic profit</td>
<td>Relative price movements</td>
<td>Cash flow analysis</td>
</tr>
<tr>
<td>Cash flow</td>
<td>return on investment</td>
<td>Value drivers</td>
</tr>
<tr>
<td>Free cash flow</td>
<td>Value of the firm</td>
<td></td>
</tr>
<tr>
<td>Human resource effectiveness</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Profitability</strong></td>
<td><strong>Market Performance</strong></td>
<td><strong>Debt Service</strong></td>
</tr>
<tr>
<td>Return on assets (after taxes)</td>
<td>Price/earnings ratio</td>
<td>Interest coverage</td>
</tr>
<tr>
<td>Return before interest and tax</td>
<td>Cash flow multiples</td>
<td>Burden coverage</td>
</tr>
<tr>
<td>Return on current value basis</td>
<td>Market to book value</td>
<td>Fixed changes coverage</td>
</tr>
<tr>
<td>EVA and economic profit</td>
<td>Relative price movements</td>
<td>Cash flow analysis</td>
</tr>
<tr>
<td>Cash flow</td>
<td>return on investment</td>
<td>Value drivers</td>
</tr>
<tr>
<td>Free cash flow</td>
<td>Value of the firm</td>
<td></td>
</tr>
</tbody>
</table>

4.1 Management’s viewpoint

Management has a twin interest investigating financial performance: The first is to measure the effectiveness and success of processes. The second is to review how efficiently the assets of the company are being used.

Assessing company’s procedures is mostly through an analysis of the income statement, while assets efficient usage, is usually measured by studying both the balance sheet and the income statement. However to make economic decisions, it’s often re-
quired to adjust the existing fiscal information to mirror present financial values and settings. (Helfert, 2001)

As seen in Table 2.1, Management separates its analysis tools in three major areas: Operational Analysis, Resource Management and Profitability. Operational analysis is actually analysis in “common numbering”. Essentially it is a percentage analysis, for which various ratios have been employed. Actually most of the indicators in financial analysis, if not all, are ratios of numbers (elements) found inside the four (4) economic statements. These ratios provide us with an initial picture of the financial analysis.

The following is a list of that most basic tools (ratios) as found in Helfert’s work [28].

Operational analysis indicators

Gross Margin: It is the ratio of cost of goods sold (cost of sales) as a percentage of total sales. It designates the extent of the cost of goods acquired or factory-made, or the cost of provided services, relative to the gross profit remaining for operating expenses and profit.

Profit Margin: The relationship of reported net profit after taxes (net income) to sales indicates management’s ability to operate the business with sufficient success. Other variations including Earnings before Interest and Taxes (EBIT) to Sales, Earnings before Interest and Taxes Depreciation and Amortization (EBITDA) to Sales and Net Operating Profit after Taxes (NOPAT) to Sales, are ratios indicating the profit margin of the company.

Other tools in this area include: Operating Expense Analysis: It is been represented by the expense ratio, and Contribution Analysis ratio: which is mostly used by company’s’ inner management.

Recourse Management tools

Here it is of interest a view of efficiency that management has employed for the financial resources trusted by the shareholders. The major ratios in this area are:

Asset Turnover: which specifies the magnitude of the verified asset commitment that is needed to maintain a specific level of sales. And working capital management: Amongst the resources of a company, special attention is given to the main working capital accounts, these are inventories and accounts receivable.
**Profitability tools**

Here lies to the efficiency with which administration uses both the total assets and the net assets as logged on the balance sheet. Profitability analysis tools are directly intertwined with financial valuation tools and techniques as one can see further below. Related ratios include:

*Return on Assets before Interest and Taxes*. This return ratio signifies the gross earnings potential of the capital asset engaged in the company, which is independent of the type of funding that provided it, and of any changes in the tax laws.

It is calculated as: $\frac{\text{Net profit before interest and taxes (EBIT)}}{\text{Average Assets}}$

Other tools in the concept of profitability, like cash flows and economic profit, or economic value added (EVA) will be discussed later in the area of financial valuation.

**Owner’s viewpoint**

These are the shareholders of the business to which administration is responsible and accountable. It must be pretty clear that the management of a company must be totally aware of, and receptive to, the owners’ point of view and their prospects regarding scheduling, implementation, and evaluation of the results of management actions. This is the foundation for stakeholder’s value formation[28]. (Helfert, 2001)

The main interest of business owners is investment return. In this framework, is referred to returns achieved. They are also interested in the nature of earnings that they occupy; that is, how much money are reinvested in the business compared to how much is returned to them as dividends, or, sometimes, through the re-purchase of outstanding shares. Lastly, they are worried about business results realized, and the future prospects about results, and finally on the market value of their investment, particularly in the circumstance of publicly traded stocks.

**Investment Return**

*Return on Equity*. The key used ratio for calculating the return on the stakeholders’ investment is the connection of net profit to equity, or else called total shareholders’ investment. It can be measured as a percentage of:

$$\text{Return on Equity} = \frac{\text{Net profit}}{\text{Stakeholder's investment}}$$
Return on Common Equity (ROE). This more sophisticated version of the measurement of return on the shareholders’ investment. It is used when there are numerous types of stock outstanding, like preferred stock in various forms. This percent can be calculated as a percentage of:

\[
\text{Return on Equity} = \frac{\text{Net profit to common}}{\text{Average common Equity}}
\]

Earnings per Share. The study of earnings from the owners’ viewpoint typically focuses on earnings per share in the event of a corporation. This ratio basically divides the net profit to common stock by the average number of shares of common stock outstanding. It is a figure that both management and stakeholders pay an excessive deal of attention. Other ratios in this area include:

Cash Flow per Share. This figure is often used as an approximate indicator of the company’s capability to pay cash dividends. And Share Price Appreciation. Where investors anticipate a rise in the value of their common shares over time.

Disposition of Earnings. The periodic splitting of earnings (net profit) into dividends compensated and earnings reserved for re-investment is observed by stockholders and the financial community, because of the arrangement between cash leaving the financial system and the remaining residual, which forms the owners’ equity and is a basis of resources for management’s usage. Here the various ratio tool include:

Dividends per Share. Dividends are usually acknowledged on a per share basis every quarter by the company’s board of directors, these are the chosen representatives of the stockholders. And Payout Ratio. A ratio usually used in association with the policy over dividends.

Market Indicators.

Here the most important ratio tools are: Price/Earnings Ratio. The connection among present or anticipated earnings per share and the existing market price of the stock is frequently cited by both administration and shareholders.

Market-to-Book Ratio. This indicator connects present market value (per share) to the specified book value of shareholders’ equity on the balance sheet (per share).

Relative Price Movements. They are the all known price movements of company’s stock over time. They can be seen on a price/time diagram (stock chart). They can be
expressed as absolute currency terms, or in several of the ratios already mentioned. And *Value of the Firm*, which is very ordinary notion that identifies the two main modules of a company’s capital configuration, equity and debt, are appreciated independently in the market.

*Current Performance*

A start on the evaluation of the present performance of a company can be done by figuring the earnings per share (EPS) of a common stock. For their calculation the following is followed. First, establishing the earnings before interest and taxes (EBIT). From this figure a subtraction of numerous charges related to various long-term funds. These are the interest charges on long-term debt, income taxes percent, and preferred dividends if any. The final figure can be divided by the total number of common stocks to provide a rough EPS. Again subtracting other common dividends per share appears a retained EPS value.

4.2 The Lender’s viewpoint.

Lenders, that is to say banks and other financial institutions that provide credit, are mostly concerned in financing the requirements of a successful business that will accomplish her goals as anticipated. Meanwhile, they need to think through the probable negative consequences of company’s failure to pay and bankruptcy.[26] (Helfert, 2001).

*Liquidity*

According to Helfert (2001), one approach to examine the point of safety lenders can afford, emphases on the temporary credit they provide to a business to finance its operations. In this region the most important tools are:

*Current Ratio.* The ratio most regularly used to evaluate the debt in risk, as can be seen on the balance sheet, is the current ratio.

*Acid Test.* The acid test or quick ratio is a more thorough indicator, calculated by using only a percentage of current assets, particularly, cash, marketable securities, and accounts receivable. Other tools include: Quick Sale Value, Debt to Assets. Debt to Capitalization. Debt to Equity.
Cash Flow Analysis. In order to define a business’s capability to cover its debt responsibilities it has most meaning, when an assessment of past revenues and cash flow patterns is conducted over a sufficiently long period of time to specify the main operational cycles that are typical for the business and its sector. This outline of past situations has to be projected into the future to specify what capacity of protection exists to cover interest, principal reimbursements, and other fixed expenses.[28] (Helfert, 2001)

4.2.1 Forecasting financial requirements

Forecasting financial requirements is the part of the company’s planning procedure where administration locates company’s future activities relative to the expected economic, competitive, technical, and social environment. When business planning is conducted, it is typically organized around precise objectives that set in cooperation by the organization and its subgroups. The plans normally spell out strategies and actions for achieving desired short-term, intermediate, and long-term results, with special attention to the need for creating shareholder value by exceeding the cost of capital in ongoing operations as well as sound new growth investments.

Eventually, such plans are quantified in financial terms, in the form of projected financial statements (pro forma statements) and a variety of operational budgets. Detailed cash budgets and cash flow statements are used to provide greater insight into the funding implications of the projected activities. Also, key ratios are usually calculated and presented.

Pro Forma Economic Reports

The best way to delve into the prospect financial performance of a business can be done by conducting a set of pro forma reports. These are just a revenue report and a related balance sheet protracted into the future by a variety of assumptions. It is to be noted here that they are not based on thorough accounting transactions, but more on a creative usage of the fiscal report context as a basis on which to place future prospects.[28](Helfert, 2001)

Sensitivity Analysis

One of the benefits of financial modeling is the capability to implement sensitivity analysis with significant easiness. This method includes choosing some important per-
formance drivers and modifying them to define the sensitivity of the outcome to such changes.

The Time Value of Money

Due to the fact that most decisions have a future orientation, the appropriate application of fiscal thinking needs us to identify the close linking between two important features: a) the precise timing of each cash in-flow and out-flow related to the decision and b) the collective importance of all related cash flows at the time of decision.

Components of Analysis

In principle, funds are invested for one simple purpose: to get adequate future financial returns to secure the original expense and any other associated future expenses. These are enough cash returns over the lifespan of the project to explain the cash spent. This simple exchange of existing cash out-flow against anticipated future cash in-flow need to be acknowledged by any of the analytical approaches used. To judge the appeal of any economic venture, we need to take into consideration the next four features involved in the decision process:

• The capital — the net investment.
• The probable paybacks — the net operational cash in-flows.
• The time duration of paybacks — the economic life.
• Any final retrieval of the capital invested — the terminal value.

An appropriate financial analysis need to consider these four elements, to define if the investment is meaningful.

Plain Measurements

Payback

Here we have a direct relation between the supposed levels of yearly cash inflows from a project to the essential net investment.

Rate of Return

This ratio reports the appeal of an investment, expressed as a percentage return on the initial capital.

Net Present Value
This measure has developed to be the most frequently used indicator in business financial and valuation analysis, and is recognized as the favored measure in the broadest range of analytical procedures. It reports the cash flow exchange among investment expenses, future paybacks, and terminal values in equal existing value terms, and lets the analyst to define if the net weight of these values is promising or not.

![General Time Scale for Cash flow Analysis](Helfert, 2001)

**Internal Rate of Return (IRR)**

The internal rate of return is basically the single discount rate that, when is applied to both cash in-flows and cash out-flows over the project’s financial life, delivers a zero net present value, this present value of the inflows should be exactly equal to the present value of the outflows. Comparing IRRs of two separate investments. One may choose the option that has highest IRR, depending the required initial capital amount of each.

**Annualized Net Present Value**

In this case someone has to assess how much of an annual shortage in operating cash inflows would be allowed over the full fiscal life of an investment, while still achieving the typical minimum return. To do this, the analyst has to transform the net present value into an annuity over the lifespan of the project just by using the present value relationship:

\[
\text{Annuity} = \frac{(\text{Net})\text{present value}}{\text{Factor}}
\]
Again this annuity allows for the estimator to gain a clearly view of the cash flows of the project over an annual basis (annualization)

**Other considerations**

In order to analyze successfully the financial performance of companies an analyst should consider other factors regarding the strategic perspective of a business effort. These are: the probable financial conditions, the picture of the company’s specific industry or sector, the competitive placement of the company among its competitors, and the core competitive advantages of the company.

### 4.2.2 Valuation and business performance

**Definitions**

Defining all types of value being encountered earlier and stating clearly what they represent, would be very beneficial for the rest of this work.

**Economic Value**

This concept is used extensively to define stockholder value creation, since it communicates the basic ability of an asset, to return a series of after-tax cash flows to the owner. These cash flows may be created through earnings, or predetermined payments, and fractional or complete liquidation at a future time. Economic value is essentially a cash flow exchange notion.

**Market Value**

This is the value of any asset, or a group of assets, when exchanged in an organized environment (market), or negotiated among buyers and sellers, in an idealized transaction with no stress.

**Book Value**

It’s a historical value that, at one time, might have represented market value, but the passage of time and changes in economic conditions increasingly distort it.

**Liquidation Value**

This value communicates to the exceptional circumstances when a business needs to liquidate part or all of its assets and claims. In essence, it’s an abnormal situation
where time stresses alter the value estimations made by private buying and selling parties.

Other definitions of value include: Breakup Value, Reproduction Value, Collateral Value, Assessed Value, Appraised Value, Going Concern Value, Shareholder Value

### 4.2.3 Summary

In this chapter, a presentation of the basic analytical context for business financial and investment analysis was conducted, within the framework of the key important considerations and concepts, essential for most business applications. It would not be of the scope of this work, to elaborate further on economic analysis as well as other sophisticated analysis and decision making tools.

In the next chapter will follow a literature review on similar methodological studies as the current one regarding green companies and their financial performance.
Chapter 5 Similar studies

In this chapter a research of similar studies to the present work will be presented. Some of these studies have already shown up in the first chapter of this work, but this time there will be a more comprehensive view on their methodology and assumptions as well to their conclusions, regarding green companies and their economic performance. It would be appropriate also to note that all the studies to be presented are both academic papers as well as thoroughly extensive researches.

Stefan Ambec and Paul Lanoie in their 2008 paper, provide a systematic overview in the problematic of “going and getting paid”\textsuperscript{29}. The authors define the problem well within its context. Going through an extensive research of studies, they review the observed indications of progress in both ecofriendly and economic or financial performance. In their work, they outline the arguments of previous authors regarding the problem. They recognize that companies can attempt to decrease their green influences without hurting their financial performance by applying such a vigorous innovation strategy. They define seven strategies for this venture, through different streams that can lead to successful implementation of environmental practices. A rise in profits can be achieved by gaining better access to certain markets, promoting differential products, selling pollution control technology. Improved green performance may also lead in cost decreases through risk management and external shareholders relations, reduced costs of materials, energy and services, cost of capital and labor.

Ambec and Lanoie (2008) analyze these strategies by researching event and long term (regression analysis) methodologies of previous researchers. Conclusively their objectives are being met, expenses incurred for applying green business policies and procedures can be partially or entirely counterweighted by profits made elsewhere. More important, they discover that by “going green”, companies can increase profits and decrease their costs, when they exploit the right circumstances. This means that the procedure is not automatic, but rather the fact, that firms must research for these “right” circumstances along with applying environmental procedures.

\textsuperscript{29}Stefan Ambec & Paul Lanoie, 2008, Does It Pay to Be Green? A Systematic Overview, Academy of Management Perspectives
Previously, in 2001, Andrew A. King and Michael J. Lenox, already suggested that is not a question of “if” but rather a question of “when” does it pay to go “green”\(^{30}\). These two researchers investigate all previous studies concerning the “pay to green” hypothesis as well as the arguing ones. They discover that higher environmental performance is related with a better financial one, but these early studies lacked significant data. In their work they also discuss how a company’s constant characteristics and strategic placement could mutually cause both lesser pollution levels and better financial performance and thus create the appearance of a straight connection between these two. To help them discriminate the results of pollution decrease from other primary influences, they implement practical methods which are justified for yet unquoted company features.

Thus, King and Lenox (2001), distinct environmental performance into two concepts: 1) comparative performance inside a specified industrial sector and 2) the typical performance of sectors where someone selects to research. They analyze a large number U.S. manufacturing firms for a given time period. After the analysis they find signs of actual relation among lesser pollution and greater fiscal performance. They also demonstrate that a company’s green performance in relation to its industry, is connected with a better economic performance. Unfortunately they cannot show decisively, that a company’s decision to operate in less pollutant sectors is related with improved economic performance, nor can they prove the causes for the observed associations. Therefore, their study offers support for a link between some elements of pollution decrease and financial performance, but it also proposes a reason for this connection to be recognized under a future research.\(^{31}\)

About the same period (2000), two other researchers, Ike and Lynnete Mathur (Southern Illinois University at Carbondale) argued about the positive impact in the revenue result or stock price fluctuations of business news about green marketing actions. Applying an event study methodology over a specified sample of companies, they discovered that news related to green products, recycling struggles, and actions of envi-


ronmental policy executives consequence in minor stock price reactions. Yet, news for green publicity efforts yield considerably negative stock price fluctuations. A test group of economic and operative features demonstrates that companies with better advance in revenues, corporations, and businesses with higher advertising efforts receive quite less negative stock price movements.

Ike and Lynnette Mathur (2000), concluded that investors have doubts about corporate environmental marketing. Still, stockholders appear more comfortable with green promotion activities by companies that have somewhat better economic performance, as seen in their progress in earnings per share, firm size, and the advertising-to-sales ratios. Businesses with fairly better economic performance could receive reliability by investors. Therefore, their green advertising actions can be received more positively. Conversely, it is likely that green promotion actions by businesses with moderately weaker economic performance can be regarded by possible stockholders as opportunistic, therefore causing more negative stock price movements.

One of the first systematic studies on Dow Jones Sustainability index was reported by M. Lopez, A. Garcia and L. Rodriguez (2007). The researchers studied whether corporate performance is altered by the implementation of procedures comprised under the concept Corporate Social Responsibility (CSR). To accomplish this objective, they analyzed the association among CSR and specific accounting indices and inspect if appear noteworthy changes in performance indicators among European companies that have implemented CSR and other companies that have not. The results of agreement with the demands of CSR were specified on companies comprising the Dow Jones Sustainability Index (DJSI), and particular accounting indices were practiced to count performance. To achieve these, they chose one group of companies belonging to the DJSI and an additional contained of firms cited on the Dow Jones Global Index.  

The three researchers concluded that expenditures that companies suffer as a result of their socially responsible activities can put them at a monetary disadvantage regarding other, not so responsible companies, in the short-run. Nevertheless, it appears that this undesirable effect on performance, as counted by the difference in performance indi-

ces, is self-adjusting, because the variances lessen over time, as presented in the results. Another conclusion from their study is affirmation that the result of sustainability applications on performance indices is damaging during the first years in which they are implemented. In the time framework reflected in their work, it is confirmed that diversity in the exploitation of resources happens and is negative. Finally the time frame considered, provided no grounds for stating that the implementation of sustainability actions will have progressive results on performance indices.

In 2011, Chin-Chen Chien and Chih-Wei Peng, published a paper where they used obligatory releases of environmental expenses for public organizations in Taiwan, to study the effect of investment in anti-pollution activities on long-term economic performance. They broke down pollution controlling investments into the below two categories, by examining the text of the announcements made in annual reports. The two categories were: pollution inhibition and end-of-pipe (EOP) solutions. Collecting a group of five of the most important polluting businesses in Taiwan from 1989 to 2006, they discovered that companies advancing intensely with pollution inhibition projects have considerably outperformed other firms who responded slowly with end-of-pipe solutions. Furthermore to the concept that ecological costs are not essentially harmful to businesses, their outcomes suggested that traditionally opposing areas of financial reporting, may become consistent if the accounting standards express the unlike features of pollution controlling projects.  

The same year 2005, two other researchers Purba Rao and Diane Holt published a paper trying to detect possible relations among ecofriendly supply chain management, as an effort for environmental improvement, financial performance and effectiveness between businesses in South East Asia. To achieve this, they developed a theoretical model from other studies and a collection of data they got from using an organized survey sent to a group of innovative ISO14001 qualified businesses in South East Asia, followed by essential equation modelling. Their study recognized that making “green” the various stages of the supply chain points to a cohesive green supply chain, which drives to effectiveness and financial performance. Their research presented the first experiential assessment of the connection among green supply chain management

activities and enhanced effectiveness and better financial performance between a group of organizations in South East Asia.\textsuperscript{34}

In 2004, a Greek researcher, Margarita Tsoutsoura published a significant work regarding the association of corporate social responsibility (CSR) and financial performance. Using wide-ranging information for a period of five years, she explored and verified the above relationship. In her dataset, she included most of the S&P 500 companies from 1996-2000. The relationship was tested with empirical methodology. The outcomes indicated that relationship is affirmative and statistically important, supporting the interpretation that socially responsible company performance can be related with a chain of significant paybacks.\textsuperscript{35}

Nicole Darnal of George Mason University, explored in 2009, the relation between regulatory stringency, green production offsets, and organizations’ financial performance. In his work, he tested two problems, first if companies that willingly decrease their environmental effects are more expected to profit monetarily and secondly if companies that are ruled by more strict green policies are less probable to increase revenues. To appraise the two problems, he depended on information collected from survey developed by the Environment Directorate of the Organization for Economic Co-Operation and Development (OECD) and academic researchers from Canada, France, Germany, Hungary, Japan, Norway, and the United States. The survey outcome provided information managers whether their production unit had experienced an alteration in environmental effects per unit of production in the previous three years. The results shown that companies experience costs as an outcome of environmental rules, but that these costs can be minimized or even diminish entirely for companies that reduce their environmental damages to a higher point.\textsuperscript{36}

A very interesting academic work was published also in 2009, by Eva Horváthová, from Czech Republic. In her paper, she studied the diversity in economic green performance grids, empirically executing a meta-regression analysis of 64 results from other empirical studies to reveal the primary reasons, which can affect the observed


\textsuperscript{35} Tsoutsoura Margarita, 2004, “Corporate Social Responsibility and Financial Performance”, Center for Responsible Business - University of California, Berkeley.

\textsuperscript{36} Nicole Darnall, 2009, “Regulatory Stringency, Green Production Off sets, and Organizations’ Financial Performance”, Public Administration Review, May | June 2009,
discrepancy in the empirical outcomes. These results propose both that the empirical process used, was important for the grids and that the probability of discovering a negative relation among environmental and financial performance increases considerably when someone uses simple association coefficients instead of more specialized econometric analysis. The outcomes also specify that the portfolio studies have a tendency to show a negative association among environmental and financial performance. This possibly mirrors the absent issues in portfolio studies. A positive relation is established more often in common law countries than in civil law countries. The results also indicate the significance of proper time analysis to create a positive relation between environmental and financial performance. This leads to a recommendation, that it takes time for environmental regulations to provide benefits in financial performance.  

In 2005, Bruce Clemens, a much respected academic researcher, published a study which examined the problem in the area of small firms. He discovered unexpectedly that little enquiry had been done on the environment and small firm’s performance connection. His research reported a positive link between “going green” and financial performance. Specifically, that these small companies that do better environmentally are also the most positive financially. In his study, he also explored green financial reasons that boost green practices. The outcomes shown that the positive link between green and financial performance is better when few environmental economic inducements occur for small firms. While not theorized, his work found a positive link among green monetary inducements and small company performance, suggesting that small businesses should think encouraging the public state to embrace green financial incentives.  

In 2003, Devashish Pujaria, Gillian Wright, Ken Peattie, published an article about environmental and competitive impacts on Environmental New Product Development performance (ENPD). An earlier researcher, (Crul, 1994) observed the introduction of ENPD as a process-oriented transformation in the mental approach and actions of a business, inserted in the development of product innovation. The three academics in their work, described the results of an extensive research project on environmental

new product development (ENPD) within U.K. producers. A major influence of their paper is the effort to incorporate new product development (NPD) and green management attitudes so as to improve and experimentally test a theoretic context for ENPD and performance. For that reason, their work is one of the first attempts to advance the unofficial evidences in the existing literature, to research realistically ENPD actions and their effects. This idea adds to the discussion about the prospective for companies to be ‘‘green and competitive’’ at the same time, by investigating the association between ENPD actions, market and green performance for eco-friendly new products. Opposing to the popular view, the outcomes suggested that there is more interaction than conflict among conservative and ecological product development models.\textsuperscript{39}

A resource-based outlook on green business performance and profitability is the framework studied by Michael V. Russo and Paul A. Fouts (1997). In their published academic research, they suggested that green activities and economic performance are related in a progressive manner and that industrial progress restrains this relationship, with the revenues opposed to green performance ratio growing higher in high-developed industries. They investigated these theories through an analysis of 243 companies over a two year timeframe, by means of autonomously established environmental evaluations. Their outcomes specified exactly that, "It pays to be green" and this connection toughens as industry progress. They concluded their work by underlining the theoretical and administrative implications and by signifying the social issues in management literature.\textsuperscript{40}

In 2001, Shameek Konar and Mark A. Cohen tried to figure out the relationship between market value and environmental performance. They reported a study that related the market value of companies quoted in the S&P 500 to objective procedures of their environmental performance. After investigating for variables conventionally accepted of explaining company’s financial performance, they discovered that low green performance is negatively linked with the intangible asset value of firms. The average intangible asset value for their sample of companies was $380 million-about 9\% of the replacement value of tangible assets. They concluded that legitimately re-


leased toxic substances have a substantial effect on the intangible asset value of publicly traded businesses. A 10% decrease in releases of toxic substances results in a $34 million surge in market value. The extent of these effects differs across industries, with greater losses found to the traditionally polluting industries.\textsuperscript{41}

In Indonesia, Susi Sarumpaet examined the relationship between environmental and financial performance, publishing a study in 2005. There he surveyed the association among environmental performance and financial performance between Indonesian businesses. The environmental performance was figured by business environmental scores delivered by Bapedal (the Ministry of Environment), through a database, called PROPER, whereas the financial performance was figured by return on assets (ROA). Other control variables were also incorporated in his analysis, specifically: total sales, industry sector, stock exchange citation, and ISO 14001 certification. His study shown that while financial performance is not considerably linked with environmental performance, firm size, stock exchange citation and ISO14001 are considerably related with environmental performance. This conclusion also showed that the government environmental assessment was extremely dependable with international environmental certification.\textsuperscript{42}

In 2001, Robert Heinkel, Alan Kraus, and Josef Zechner, issued a research concerning the effect of green Investment on corporate behavior. Their work examined the outcome of exclusionary moral investments on business behavior in a risk-averse, stabilized background. Although opposed opinions were that moral investing can effect a company’s cost of capital, and thus influence investment, no stabilized model has been shown to do so. They presented that exclusionary moral investing drives polluting companies to being owned by less investors, as green investors avoid polluting companies’ stock. This shortage of risk allocation between non-green investors drives to lower share prices for polluting companies, therefore raising their cost of capital. If the increased cost of capital will become greater than cost of reforming to greener behaviors, these polluting companies will develop to socially accountable ones because of exclusionary moral investing. An important factor of the inducement for polluting companies to change is the portion of capitals controlled by green investors. In their


model, an empirically rational constraint evaluation indicated that an additional 20% of green investors are necessary to convince any polluting companies to change. At that time, observed indications shown that at most 10% of resources are capitalized by green investors.  

In 2009, Jose F. Molina-Azorin, Enrique Claver-Cortes, Maria D. Lopez-Gamero and Juan J. Tari, conducted a thorough literature review regarding green management and financial performance. An analysis of the available literature was carried out to appraise the measurable studies that examine the impact of environmental management on financial performance. A whole of 32 academic readings were acknowledged, inspecting the green variables used, the economic performance variables, the numerical studies, and the key results gotten by these studies. Outcomes are varied, but studies where an affirmative effect of environment on economic performance is found are principal. Furthermore, their results display that the samples of companies, sectors and states are mixed. Some studies practice green administration variables while workings use green performance variables, and regression analysis is dominant. Their work does not take into account studies that examine the effect of green management on environmental performance. Their paper proposed motivating implications for executives, indicating that a genuine pledge to environmental management can produce a positive effect on financial performance. Their conclusions resulted from a comprehensive literature assessment of measurable studies that studied the environmental management-financial performance connection.

Finally in 2012, Karen Shortt issued a paper questioning if ‘going green’ makes economic sense. In her paper she attempted to show that there is a negative correlation between environmental and financial performance. According to her, the rewards of an improved reputation, responsibility evasion, and waste minimization, are overshadowed by the drawbacks of enlarged operational costs and restricted investment prospects that derive from green investments. In return the market does not accepts well corporate news that are related with environmental activities.

---


Her paper was based on event study methodology to settle on the relationship among green and financial performance. This methodology was used to take out the part of stock proceeds that could be credited to firm-specific actions, for example the release of a statement detailing ecological action, rather than to variations in the market in full.

She concluded that there is a weak statistical connection among green and financial performance. Her research also recommended that the pathetic association between financial and ecological performance is partly due to discrepancy in market reactions over press releases and various industries. It becomes visible that the market reacts positively to lively press releases, those that publish particular investments, based on the financial worth of these projects. On the other hand, press releases, which don’t share the same financial characteristics, are viewed in a negatively manner by the market.

5.1 Summary

In this chapter we conducted a review of the most important similar works on green-financial performance connection. Most of the studies indicated a clear positive role of green applications on corporate environment and especially in the financial picture of implicated organizations. In the next chapter there will be carried out an examination of the problem beginning with its importance.

---

Chapter 6 Methodology and data description

Data Description

In an earlier chapter there was thorough description in most of the indices used in the financial analysis of companies. For our purposes we have to collect data that involve 5 key ratios usually used in the economic analysis of firms. These are: Return on Assets (ROA), Return on Invested Capital (ROIC), Return on Equity (ROE), Earnings per Share (EPS) and Profit Margin. Financial data will be extracted by Bloomberg.com and also a well renowned financial site in US, Morningstar.com and more specifically: financials.morningstar.com in the key ratios area. It contains financial data for all companies listed in S&P 500 index from 2004 to 2013. For the comparative analysis of the key ratios, we will create tables for each ratio, containing all 20 firms of company sample.

For the sample of the 20 random companies, we referred to Dow Jones Sustainability index (DJSI) a creation of S&P Dow Jones Indices and RobecoSAM Company.

The Dow Jones Sustainability North America Index (DJSI North America) was established in September 2005 to follow the performance of firms from Canada and the United States of America which are leaders in the area corporate sustainability. These companies are reviewed by RobecoSAM by the annual Corporate Sustainability Assessment (CSA). Qualified companies are encouraged to vigorously participate in the evaluation. However, RobecoSAM keeps the right to implement the same review methodology to companies that do not participate, from the qualifiers universe using information accessible in the public domain. In this manner at least 50% of industry and index region is reviewed, certifying a best-in-class choice can take place.

Established in 1999, as the first ever group of global sustainability standards, the Dow Jones Sustainability Indices (DJSI) have developed to a reference point in Sustainability Investing. Launched as joint venture among S&P Dow Jones Indices and RobecoSAM, the DJSI combines the knowledge of a recognized index provider with the know-how of an expert in Sustainability Investing to deliver stakeholders with objective standards for managing their sustainability investment portfolios. Attached
with the results of RobecoSAM’s yearly Corporate Sustainability Assessment (CSA), the DJSI encompass global and regional standards as well as subcategories that permit investors to discount particular industries or even create custom indices.

The DJSI group bases a best-in-class methodology to choose sustainability leaders from across all industries using pre-defined sustainability measures incorporated in the CSA. Best-in-class criteria are these where:

- No industry is excepted from the indices, with the most sustainable firms in each industry designated for index participation
- Firms get a Total Sustainability Score between 0 – 100 and are graded against other companies in their industry.
- Only the highest 20% of companies from every industry, based on their sustainability mark, are participating in the Dow Jones Sustainability North America Index.

For these reasons, firms must constantly strengthen their sustainability edges to be included or to continue in the index. An increasing number of companies state that membership in the DJSI is a business objective as it publicly validates their effort to confront key sustainability problems in the framework of an organized and unbiased comparative analysis.

RobecoSAM’s method is based on two guiding values:

- Sustainable corporate practices are essential for creating long-term stakeholder value while global resources continuously diminish.
- Sustainability aspects signify opportunities and risks that competitive businesses must address.

RobecoSAM’s philosophy strongly considers that the addition of sustainability principles into traditional economic analysis benefits analysts to appraise companies’ quality of management and future performance potential. This in turn permits analysts to recognize attractive investment prospects that can produce long lasting value for their clients. In short, concentration on sustainability drives to better knowledgeable investment decisions.

RobecoSAM’s Corporate Sustainability Assessment (CSA) is the key research tool of the globally recognized Dow Jones Sustainability Indices. This tool offers direct ac-
cess to businesses and their practices, allowing the Company to build one of the world’s most wide-ranging research databases on corporate sustainability.

The Dow Jones Sustainability North America Index (DJSI North America) follows the performance of the highest 20% of the 600 largest Canadian and American firms in the S&P Global Broad Market Index SM that are leaders in sustainability. These 600 companies signify the qualified universe for the DJSI North America and are evaluated using the CSA on yearly basis.
6.1 Green Companies

The sample of twenty (20) “green” companies was kindly provided by RobecoSAM Company.

“Established in 1995, RobecoSAM is an investment professional focused solely on Sustainability Investing. Together with S&P Dow Jones Indices, RobecoSAM issues the worldwide acknowledged Dow Jones Sustainability Indices (DJSI). Based on its Corporate Sustainability Assessment, an annual ESG analysis of 2,800 listed companies, RobecoSAM has compiled one of the world’s most comprehensive databases of financially material sustainability information.”

These companies are a random part of the total listed in the DJSI (Dow Jones Sustainability Index) North America historical index continuously from 2005. The sample of companies are found below with description from csimarket.com, a recognized “independent digital financial media company and provider of integrated financial information and analytical applications to the global investment community.”: Appendix A is totally devoted in providing the stock charts of these 20 companies in comparison with S&P 500 for the predefined period (2005-2014).

1. Accenture Plc (ticker: ACN)

Accenture Plc is a globally leading organization that provides management consulting, technology and outsourcing services. The company is listed in professional services industry and services sector.

2. 3M Company (ticker: MMM)

3M is a differentiated technology company with an international participation in the many markets: health care; manufacturing; graphical display; consumer and office; safety, security and protection services, telecommunications, electronics, and electrical; and transports. 3M is a global enterprise characterized by substantial internal collaboration in research, manufacturing and marketing of products. The company is listed in conglomerates industry and sector.

---

47 csimarket.com/help/About_us.php, 2014, CSImarket website
3. *Abbott Laboratories (ticker: ABT)*

Abbott records five revenue divisions: Diagnostic Products, Pharmaceutical Products, Hospital Products, International Products and Ross Products. Abbott also owns a 50 percent joint undertaking, TAP Pharmaceutical Products Inc. The company is listed in the Major Drugs industry and the Healthcare sector.[48]

4. *Advanced Micro Devices, Inc. (ticker: AMD)*

AMD is a semiconductor producer with industrial facilities in the USA, Europe and Asia and worldwide sales offices. They design, build and market circuits of industry standards, with digital integrations, that can be utilized in a great variety of products. Their products include microprocessors, flash memory devices and implanted microprocessors for personal connectivity devices. The company is listed in the Semiconductors industry and the Technology sector.[48]

5. *Agilent Technologies, Inc. (ticker: A)*

Agilent Technologies, Inc., incorporated in Delaware in May 1999, is a global diversified technology company that provides enabling solutions to markets within the communications, electronics, life sciences and chemical analysis industries. The company is listed in the Electronic Instruments & Control industry and the Technology sector. [47]

6. *Alcoa Inc. (ticker: AA)*

Alcoa is a world leader in the production of primary aluminum, manufactured aluminum and alumina, and is a strong player in all the important facets of the industry. Alcoa addresses the markets involved with aerospace, auto motion, packaging, building and construction, commercial transportation and the industry, providing design, engineering, production and other services to customers. Furthermore, Alcoa also markets customer brands like Reynolds Wrap® foils and plastic wraps, Alcoa® wheels, and Baco® household wraps. Other trades include vinyl siding, precision castings, closures, fastening systems, and electrical distribution systems for cars and trucks. The company is listed in the Metal Mining industry and the Basic Materials sector [48]
7. **Autodesk Inc. (ticker: ADSK)**

Autodesk is a global leader in design software and digital content, presenting clients advanced business solutions through great technology products and services. They support customers in the building, infrastructure, manufacturing, and the digital media sector, rise the worth of their digital design information and increase efficiencies through their whole project lifespan management procedures. They offer a broad variety of integrated design software, wireless development platforms, Internet services, and point-of-location applications that authorize millions of users. Their software merchandises are retailed in over 160 countries, both straight to consumers and also through a grid of distributors. The company is listed in the Software & Programming Industry and the Technology sector. [47]

8. **Baxter International Inc. (ticker: BAX)**

Baxter works as a worldwide medical products and services business with know-how in medical devices, biotechnology and pharmaceuticals to provide assistance to health-care experts and their patients with the treatment of complex health situations, including immune disorders, hemophilia, cancer, infectious diseases kidney disease, trauma and other conditions. The business’s products are used by hospitals, blood and plasma collection centers, clinical and medical research laboratories, kidney dialysis centers, nursing homes, rehabilitation centers, doctors’ offices. Baxter productions is made in 29 countries and retails them in more than 100 countries. The company is listed in the Medical Equipment & Supplies Industry and the Healthcare sector. [47]


BD is a medical technology firm involved mainly in the production and sale of a broad variety of medical supplies, laboratory equipment, devices, and diagnostic products used by life science researchers, healthcare institutions, industry clinical laboratories, and the general public. The company is listed in the Medical Equipment & Supplies Industry and the Healthcare sector[47]
10. *Chevron Corporation (ticker: CVX)*

ChevronTexaco Corporation, from Delaware, manages its funds in holdings and affiliates and offers administrative, financial and management provision to U.S. and foreign subsidiaries that involve in totally integrated petroleum operations, coal mining, chemicals operations, and energy and power services. The corporation runs in the United States and over than 180 other countries. Petroleum procedures consist of exploration, development and production of crude oil and natural gas; crude oil refinement into completed petroleum products; crude oil, natural gas and other petroleum products marketing; and transportation natural gas, crude oil, and petroleum products by pipeline, for marine vessels, motor equipment and rail cars. Operations in chemicals comprise of manufacture and marketing, by an affiliate company, commodity petrochemicals for industrial uses, and the production and marketing, by a combined subsidiary company, of fuel and lubricating oil preservative. The company is listed in Oil & Gas Operations industry and the Energy sector. [48]

11. *Cisco Systems, Inc. (ticker: CSCO)*

They create and sell communications and networking products and offer services related with that equipment and its use. Their products are installed at corporations, public institutions, and telecommunication companies, and commercial businesses, and are also found in personal residences. They provide a broad line of products for transporting data, voice, and video inside buildings, through sites, and globally. They operate worldwide and are managed geographically in divisions: America; Europe, the Middle East, and Africa (EMEA); Asia Pacific; and Japan. The company is listed in the Communications Equipment industry and the Technology sector. [48]

12. *Citigroup Inc. (ticker: C)*

Citigroup Inc., is a varied international financial services holding corporation whose operations offer a broad variety of financial services to customer and corporate consumers with about 200 million client accounts operating in more than 100 countries. Citigroup was established in 1988 in the State of Delaware. The Business’s actions are conducted through the Global Corporate Global Consumer and Investment Bank (GCIB), Global Investment Management (GIM) Private
Client Services, and Proprietary Investment Activities business segments. The company is listed in the Money Center Banks industry and the Financial sector.\[48\]


ConocoPhillips is a big player in the global energy field. ConocoPhillips was established in the state of Delaware on November 16, 2001, from the merger between Conoco Inc. (Conoco) and Phillips Petroleum Company (Phillips). The merger between Conoco and Phillips was completed on August 30, 2002, upon which Conoco and Phillips united their businesses by integrating with distinct acquisition subsidiaries of ConocoPhillips. The company is listed in the Oil & Gas Operations industry and the Energy sector.\[48\]

14. Dow Chemical Company (ticker: DOW)

The Dow Chemical Company was merged in 1947 also under Delaware law and is the replacement to a Michigan company, of the same name, organized in 1897. On February 6, 2001, the union of Union Carbide Corporation ("Union Carbide") with a subsidiary of The Dow Chemical Company was finalized, and Union Carbide developed to a solely owned subsidiary of Dow. The Corporation is involved in the production and sale of chemicals, agricultural, plastic materials, and other specific products and services. The company is listed in the Chemical-Plastics & Rubber industry and the Basic Materials sector.\[48\]

15. Duke Energy Corporation (ticker: DUK)


GE is one of the major and most differentiated industrial corporations globally. GE is involved in evolving, engineering and selling a wide variety of products for the generation, broadcast, delivery, control and operation of electric power since its establishment in 1892. Over the years, GE has advanced or acquired new
technologies and services that have widened substantially their activities. The company is listed in the conglomerates industry and sector.  

17. **H&R Block, Inc. (ticker: HRB)**  

H&R Block is a diversified firm providing tax services and financial guidance, investment and debt products and services, corporate and consulting services. For about half a century, the company has developed dealings with millions of tax clients in the United States, and also in Canada, Australia and the United Kingdom and its policy is to grow on these dealings. In addition it offers investment services and securities products, as well as mortgage products & Services. The Company is listed in the Personal Services industry and the Services sector.  

18. **Entergy Corporation (ticker: ENT)**  

Entergy Corporation is an energy company mostly dealing with electric power production, energy marketing and trading, retail electric distribution operations, and gas transfer. Entergy has in its possession and runs power plants with roughly 30,000 MW of electric generating capacity, and is one of the leading nuclear power generators in the United States. Entergy distributes electricity to 2.6 million households and enterprises, in Arkansas, Mississippi, Louisiana, and Texas. Moreover through Entergy-Koch, Entergy provides wholesale energy marketing and trading services, as well as operating natural gas pipelines and storage facilities. The company is listed in the Electric Utilities industry and the Utilities sector.  

19. **Hess (ticker: HES)**  

Amerada Hess Corporation is a Delaware corporation, established in 1920. The company and its holdings explore, produce, purchase, transport and sell crude oil and natural gas. These operations take place in the United States, United Kingdom, Denmark, Norway, Algeria, Equatorial Guinea, Gabon, Thailand, Indonesia, Malaysia, Azerbaijan and other countries. The Company also manufactures, and markets refined petroleum and other energy products. The company is listed in the Oil & Gas Operations industry and the Energy sector.
20. Hewlett-Packard Company (ticker: HPQ.)

HP was integrated in 1947 under the laws of the State of California as the beneficiary to a partnership started in 1939 by William R. Hewlett and David Packard. Effective in May 1998, they changed their state of integration from California to Delaware. They are a leading global provider of products, technologies, solutions and services to consumers and businesses. Their products and services extent from information technology ("IT") infrastructure, personal computing and other access devices, global services and imaging and printing. Their products and services are available globally. The company is listed in Computer Hardware industry and Technology sector. [48]
6.2 Financial Data

Financial data were retrieved by the dominant renowned financial site Bloomberg.com, as well as the recognized financial site in US, Morningstar.com and more specifically: financials.morningstar.com in the key ratios area. Data include company’s figures in five (5) major ratios frequently used in the financial analysis of companies. These are: Return on Assets (ROA), Return on Invested Capital (ROIC), Return on Equity (ROE), Earnings per Share (EPS) and Profit Margin. These have already been commented in chapter “Measuring Financial Performance”. These ratios are the most commonly used for the basic measurement of financial performance of companies from professional analysts all over the world. For the analysis of the ratios, tables were created for each ratio containing all 20 firms of the sample, from 2004 to 2013. Besides data for the sample companies, there was a collection of corresponding data for the S&P 500, as the basis for the comparison. And by this methodology one can result to various conclusions about the performance of green companies.

Academics in the past have used a variety of indicators for their assessment. For example Bruce Clemens (2005) referring to Judge and Duglas (1998) work, used Return on Assets (ROA) and Return on Sales (ROS) for their evaluation. Devashish Pujaria, Gillian Wrightb and Ken Peattiec (2003) selected a questionnaire method to work on. Russo and Fouts (1998) worked with ROA, Firms Growth and Size to derive conclusions. Shameek Konar and Mark A. Cohen (1997) based their analysis on Tobin’s q.

The following table summarizes academics from the current literature review and their variables selection for analysis. One can see that key variables for the majority of academics are: ROA, ROIC, EPS and Profit Margin and thus our selection is justified.
Table 3.1. Literature review on performance variables

<table>
<thead>
<tr>
<th>ACADEMICS</th>
<th>CITATION</th>
<th>ECONOMIC PERFORMANCE VARIABLES/METHODOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruce Clemens 2005</td>
<td>Judge &amp; Duglas 1998</td>
<td>ROA, ROS</td>
</tr>
<tr>
<td>Devashish Pujaria, Gillian Wrightb, Ken Peattie 2003</td>
<td>-</td>
<td>QUESTIONAIRE</td>
</tr>
<tr>
<td>Russo &amp; Fouts 1998</td>
<td></td>
<td>ROA, FIRMS GROWTH-SIZE</td>
</tr>
<tr>
<td>Shameek Konor and Mark A. Cohen 1997</td>
<td></td>
<td>Tobin’s q</td>
</tr>
<tr>
<td>Susi Sarumpaet, 2005</td>
<td>Helfert</td>
<td>1. earnings measures (earning per share (EPS), return on investment (ROI), return on net assets (RONA), return on capital employment (ROCE) and return on equity (ROE), 2. cash flow measures (free cash flow, cash flow return on gross investment (ROGI), cash flow return on investment (CFROI), total shareholder return (TSR) and total business return (TBR), (3) value measures (economic value added (EVA), market value added (MVA), cash value added (CVA) and shareholder value (SHV)</td>
</tr>
<tr>
<td>Robert Heinkel, Alan Kraus, and Josef Zechner 2001</td>
<td></td>
<td>Normally distributed cash flows and functions</td>
</tr>
<tr>
<td>Jose´ F. Molina-Azorí´n, Enrique Claver-Corte´s,Maria D. Lo´pez-Gamero and Juan J. Tari, 2009</td>
<td>Literature review on similar studies</td>
<td>ROA, ROE</td>
</tr>
<tr>
<td>Andrew A. King and Michael J. Le- nox, 2001</td>
<td></td>
<td>Tobin’s q</td>
</tr>
<tr>
<td>M. Victoria Lo´pez,Arminda Gar- cia,Lazaro Rodriguez,2007</td>
<td></td>
<td>PBT, REV ,assets ,capitalizations ,profit margin, ROA,ROE,KPMC</td>
</tr>
<tr>
<td>Mathur &amp; Mathur,2000</td>
<td></td>
<td>event study methodology, least squares market model for normal returns</td>
</tr>
<tr>
<td>Stefan Ambbec and Paul Lanoie,</td>
<td></td>
<td>ROA, ROE,ROS,Tobin’s q</td>
</tr>
<tr>
<td>Margarita Tsoutsoura,2004</td>
<td></td>
<td>ROA, ROE,ROS</td>
</tr>
<tr>
<td>Chin-Chen Chien a, Chih-Wei Peng,2011</td>
<td></td>
<td>ROA, ROE,ROS,EPS,CFA</td>
</tr>
<tr>
<td>Purba Rao,Diane Holt,2005</td>
<td></td>
<td>New market opportunities, Product price increase, Profir margin, Sales, Market Share</td>
</tr>
<tr>
<td>Nicole Darnall,2009</td>
<td>Survey Data</td>
<td></td>
</tr>
<tr>
<td>Kevin Bostona, Pete Bettinger, 2000</td>
<td></td>
<td>Model functions, maximization of NPV of revenues,</td>
</tr>
<tr>
<td>Eva Horváthová, 2009</td>
<td></td>
<td>Modeling Environmental Performance, Financial. Performance and Statistical Meta-Analysis</td>
</tr>
<tr>
<td>Karen Shortt, 2012</td>
<td></td>
<td>Event study methodology</td>
</tr>
</tbody>
</table>
Chapter 7 Empirical Results

As discussed earlier, our methodology is based in the comparison of the average ratios (twenty companies) with the average ratios of S&P 500. In the below tables and figures, all data are placed in a yearly fashion for easy comprehension from the reader. Appendix B provides the equations for calculations of the ratios.

7.1 Profit margin ratio.

![Profit Margin %](image)

Picture 3.1 Profit margin analysis from 2004 to 2013, (TTM abbreviation for Twelve Trailing Months). Source: Bloomberg, Morningstar.com

From the above Picture 3.1 one can see that profit margin of our sample of 20 green companies is following the average profit margin of S&P 500. Generally one can see slightly better profit margins for the 20 companies’ sample, than S&P annual series. Table 3.2 provides analytical data for every company’s Profit Margin and S&P 500’ for the defined time series.
Table 3.2 Profit margin time series s from 2004 to 2013, (TTM abbreviation for Twelve Trailing Months)  
Source: Bloomberg, Morningstar.com

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accenture PLC -(ACN)</td>
<td>4.57</td>
<td>5.5</td>
<td>5.34</td>
<td>5.79</td>
<td>6.68</td>
<td>6.86</td>
<td>7.71</td>
<td>8.33</td>
<td>8.58</td>
<td>10.8</td>
<td>9.35</td>
</tr>
<tr>
<td>3M Co -(MMM)</td>
<td>14.94</td>
<td>15.11</td>
<td>16.8</td>
<td>16.74</td>
<td>13.69</td>
<td>13.81</td>
<td>15.32</td>
<td>14.46</td>
<td>14.86</td>
<td>15.09</td>
<td>15.28</td>
</tr>
<tr>
<td>Advanced Micro Devices Inc - AMD</td>
<td>1.82</td>
<td>2.83</td>
<td>-2.94</td>
<td>-56.19</td>
<td>-53.34</td>
<td>5.63</td>
<td>7.25</td>
<td>7.48</td>
<td>-21.82</td>
<td>-1.57</td>
<td>1.38</td>
</tr>
<tr>
<td>Agilent Technologies Inc-A</td>
<td>4.86</td>
<td>6.36</td>
<td>66.5</td>
<td>11.77</td>
<td>12</td>
<td>-0.69</td>
<td>12.56</td>
<td>15.3</td>
<td>16.81</td>
<td>10.68</td>
<td>10.04</td>
</tr>
<tr>
<td>Alcoa Inc-AA</td>
<td>5.57</td>
<td>4.71</td>
<td>7.39</td>
<td>8.33</td>
<td>-0.28</td>
<td>-6.24</td>
<td>1.21</td>
<td>2.45</td>
<td>0.81</td>
<td>-9.92</td>
<td>-10.4</td>
</tr>
<tr>
<td>Autodesk-ADSK</td>
<td>17.95</td>
<td>21.59</td>
<td>15.75</td>
<td>16.4</td>
<td>7.93</td>
<td>3.38</td>
<td>10.86</td>
<td>12.88</td>
<td>10.7</td>
<td>10.06</td>
<td>7.22</td>
</tr>
<tr>
<td>Becton Dickinson &amp; Co. -BDX</td>
<td>9.43</td>
<td>13.33</td>
<td>12.89</td>
<td>13.99</td>
<td>15.75</td>
<td>17.2</td>
<td>17.87</td>
<td>16.23</td>
<td>15.18</td>
<td>16.05</td>
<td>11.67</td>
</tr>
<tr>
<td>Chevron Corp-CVX</td>
<td>8.58</td>
<td>7.11</td>
<td>8.16</td>
<td>8.46</td>
<td>8.77</td>
<td>6.11</td>
<td>9.28</td>
<td>10.6</td>
<td>10.82</td>
<td>9.36</td>
<td>8.88</td>
</tr>
<tr>
<td>Citigroup Inc-C</td>
<td>19.7</td>
<td>29.32</td>
<td>23.96</td>
<td>4.38</td>
<td>-55.72</td>
<td>-11.51</td>
<td>12.23</td>
<td>14.09</td>
<td>10.71</td>
<td>17.65</td>
<td>12.8</td>
</tr>
<tr>
<td>ConocoPhillips Oil &amp; Gas-COP</td>
<td>5.94</td>
<td>7.43</td>
<td>9.28</td>
<td>6.11</td>
<td>-6.9</td>
<td>3.18</td>
<td>5.72</td>
<td>4.95</td>
<td>13.59</td>
<td>15.72</td>
<td>15.23</td>
</tr>
<tr>
<td>Dow Chemical Co-DOW</td>
<td>6.96</td>
<td>9.75</td>
<td>7.58</td>
<td>5.4</td>
<td>1.01</td>
<td>0.75</td>
<td>3.67</td>
<td>4</td>
<td>1.48</td>
<td>7.79</td>
<td>5.92</td>
</tr>
<tr>
<td>Duke Energy Corp-DUK</td>
<td>6.58</td>
<td>10.82</td>
<td>12.27</td>
<td>11.79</td>
<td>10.31</td>
<td>8.44</td>
<td>9.25</td>
<td>11.74</td>
<td>9.01</td>
<td>10.83</td>
<td>8.68</td>
</tr>
<tr>
<td>General Electric Co-GE</td>
<td>10.89</td>
<td>10.92</td>
<td>12.75</td>
<td>12.86</td>
<td>9.5</td>
<td>6.84</td>
<td>7.55</td>
<td>8.91</td>
<td>9.26</td>
<td>8.94</td>
<td>8.84</td>
</tr>
<tr>
<td>Hess Corp-HES</td>
<td>5.42</td>
<td>5.13</td>
<td>6.67</td>
<td>5.79</td>
<td>5.73</td>
<td>2.5</td>
<td>6.14</td>
<td>4.5</td>
<td>5.37</td>
<td>22.67</td>
<td>17.14</td>
</tr>
<tr>
<td>Hewlett-Packard Co. Technology-HPQ</td>
<td>4.38</td>
<td>2.77</td>
<td>6.76</td>
<td>6.97</td>
<td>7.04</td>
<td>6.69</td>
<td>6.95</td>
<td>5.56</td>
<td>-10.51</td>
<td>4.55</td>
<td>4.54</td>
</tr>
<tr>
<td><strong>AVERAGE 20 COMPANIES</strong></td>
<td><strong>9.73</strong></td>
<td>10.80</td>
<td><strong>12.53</strong></td>
<td><strong>6.53</strong></td>
<td>2.66</td>
<td><strong>7.12</strong></td>
<td><strong>9.72</strong></td>
<td><strong>10.42</strong></td>
<td><strong>8.49</strong></td>
<td><strong>10.62</strong></td>
<td><strong>9.49</strong></td>
</tr>
<tr>
<td><strong>S&amp;P 500</strong></td>
<td><strong>7.25</strong></td>
<td>8.34</td>
<td><strong>9.40</strong></td>
<td>7.11</td>
<td>2.35</td>
<td><strong>6.45</strong></td>
<td><strong>8.51</strong></td>
<td><strong>8.88</strong></td>
<td><strong>8.33</strong></td>
<td><strong>9.57</strong></td>
<td><strong>9.43</strong></td>
</tr>
</tbody>
</table>
7.2 Return on Equity (ROE)

Regarding ROE ratio one can observe that ROE of 20 green companies (Picture 3.2) follows the curve of S&P corresponding ratio. Generally it must be noted that the random sample shows better ROE ratios (heightened) than S&P 500 average ratio. It is an interesting situation pointing to positive correlation of financial performance and application of green business policies.

Almost every indicator in our research lacks in the year 2008. This year was the starting time of the global financial crisis, which justifies this decrease in figures.

![Return on Equity (ROE) %](image)

Picture 3.2 ROE analysis from 2004 to 2013, Source: Bloomberg, Morningstar.com

Table 3.3 provides analytical data for every company’s ROE and S&P 500’ for the defined time series
Table 3.3. Return on Equity (ROE) time series from 2004 to 2013, Source: Bloomberg, Morningstar.com

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Accenture PLC -(ACN)</td>
<td>60.97</td>
<td>59.36</td>
<td>54.21</td>
<td>62.82</td>
<td>73.49</td>
<td>58.59</td>
<td>62.24</td>
<td>67.84</td>
<td>63.64</td>
<td>72.08</td>
<td>53.28</td>
</tr>
<tr>
<td>2</td>
<td>3M Co -(MMM)</td>
<td>32.74</td>
<td>31.24</td>
<td>38.4</td>
<td>37.74</td>
<td>32</td>
<td>28.2</td>
<td>28.74</td>
<td>27.56</td>
<td>26.94</td>
<td>26.56</td>
<td>27.29</td>
</tr>
<tr>
<td>3</td>
<td>Abbot Laboratories-ABT</td>
<td>23.62</td>
<td>23.47</td>
<td>12.06</td>
<td>22.66</td>
<td>27.69</td>
<td>28.49</td>
<td>20.45</td>
<td>20.2</td>
<td>23.31</td>
<td>9.93</td>
<td>10.43</td>
</tr>
<tr>
<td>4</td>
<td>Advanced Micro Devices Inc - AMD</td>
<td>3.35</td>
<td>5.2</td>
<td>-3.63</td>
<td>-77.01</td>
<td>-213.07</td>
<td>107.42</td>
<td>56.71</td>
<td>37.73</td>
<td>-111.18</td>
<td>-15.34</td>
<td>18.84</td>
</tr>
<tr>
<td>5</td>
<td>Agilent Technologies Inc-A</td>
<td>10.92</td>
<td>8.55</td>
<td>85.57</td>
<td>18.54</td>
<td>23.93</td>
<td>-1.22</td>
<td>23.86</td>
<td>26.86</td>
<td>24.3</td>
<td>13.83</td>
<td>13.28</td>
</tr>
<tr>
<td>7</td>
<td>Autodesk-ADSK</td>
<td>34.89</td>
<td>45.7</td>
<td>30.39</td>
<td>30.37</td>
<td>14.45</td>
<td>4.17</td>
<td>13.75</td>
<td>16.34</td>
<td>12.6</td>
<td>10.63</td>
<td>7.89</td>
</tr>
<tr>
<td>8</td>
<td>Baxter International Inc-BAX</td>
<td>11.04</td>
<td>23.89</td>
<td>26.41</td>
<td>25.89</td>
<td>30.64</td>
<td>32.86</td>
<td>20.64</td>
<td>33.82</td>
<td>34.4</td>
<td>26.13</td>
<td>24.41</td>
</tr>
<tr>
<td>10</td>
<td>Chevron Corp-CVX</td>
<td>32.7</td>
<td>26.13</td>
<td>26.04</td>
<td>25.6</td>
<td>29.23</td>
<td>11.74</td>
<td>19.31</td>
<td>23.75</td>
<td>20.3</td>
<td>15</td>
<td>13.53</td>
</tr>
<tr>
<td>14</td>
<td>Dow Chemical Co-DOW</td>
<td>26.09</td>
<td>32.72</td>
<td>23</td>
<td>15.84</td>
<td>3.52</td>
<td>2.24</td>
<td>11.46</td>
<td>13.3</td>
<td>4.79</td>
<td>22.36</td>
<td>16.22</td>
</tr>
<tr>
<td>15</td>
<td>Duke Energy Corp-DUK</td>
<td>9.81</td>
<td>11.02</td>
<td>8.76</td>
<td>6.34</td>
<td>6.46</td>
<td>5.03</td>
<td>5.96</td>
<td>5.56</td>
<td>6.49</td>
<td>5.45</td>
<td>5.45</td>
</tr>
<tr>
<td>17</td>
<td>H&amp;R Block Inc. Retail-HRB</td>
<td>32.83</td>
<td>23.78</td>
<td>-24.35</td>
<td>-25.7</td>
<td>40.58</td>
<td>33.67</td>
<td>28.1</td>
<td>19.16</td>
<td>33.52</td>
<td>33.7</td>
<td>37.89</td>
</tr>
<tr>
<td>19</td>
<td>Hess Corp-HES</td>
<td>17.03</td>
<td>20.14</td>
<td>26.03</td>
<td>20.49</td>
<td>21.38</td>
<td>5.76</td>
<td>14.13</td>
<td>9.67</td>
<td>10.23</td>
<td>22.06</td>
<td>15.21</td>
</tr>
</tbody>
</table>
7.3 Return on Assets (ROA)

Return on Assets (ROA) for the random sample of 20 green companies (Picture 3.3) again follows the general curve of S&P 500 ROA. What is significant to note is the rather increased ROA ratio for the sample of 20 green companies. This high difference clearly points to a rather positive relation between the effects of implementing green procedures and techniques and financial performance of the businesses.

![Return on Assets (ROA) graph]

Picture 3.3 ROA analysis from 2004 to 2013, Source: Bloomberg, Morningstar.com

Table 3.4 provides analytical data for every company’s ROA and S&P 500’ for the defined time series.
Table 3.4. Return on Assets (ROA) time series from 2004 to 2013, Source: Bloomberg, Morningstar.com.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbot Laboratories-ABT</td>
<td>11.66</td>
<td>11.65</td>
<td>5.26</td>
<td>9.5</td>
<td>11.88</td>
<td>12.12</td>
<td>8.27</td>
<td>7.9</td>
<td>9.35</td>
<td>4.68</td>
<td>5.68</td>
</tr>
<tr>
<td>Agilent Technologies Inc-A</td>
<td>5.23</td>
<td>4.74</td>
<td>46.84</td>
<td>8.55</td>
<td>9.25</td>
<td>-0.41</td>
<td>7.9</td>
<td>10.79</td>
<td>11.77</td>
<td>6.82</td>
<td>6.7</td>
</tr>
<tr>
<td>Alcoa Inc-AA</td>
<td>4.07</td>
<td>3.71</td>
<td>6.34</td>
<td>6.74</td>
<td>-0.2</td>
<td>-3.02</td>
<td>0.65</td>
<td>1.54</td>
<td>0.48</td>
<td>-6.02</td>
<td>-6.29</td>
</tr>
<tr>
<td>Autodesk-ADSK</td>
<td>20.52</td>
<td>26.28</td>
<td>18.35</td>
<td>17.78</td>
<td>7.93</td>
<td>2.38</td>
<td>8.1</td>
<td>9.49</td>
<td>6.57</td>
<td>5.14</td>
<td>3.83</td>
</tr>
<tr>
<td>Chevron Corp-CVX</td>
<td>15.26</td>
<td>12.87</td>
<td>13.26</td>
<td>13.28</td>
<td>15.44</td>
<td>6.44</td>
<td>10.89</td>
<td>13.64</td>
<td>11.83</td>
<td>8.8</td>
<td>7.93</td>
</tr>
<tr>
<td>Citigroup Inc-C</td>
<td>1.24</td>
<td>1.65</td>
<td>1.27</td>
<td>0.18</td>
<td>-1.43</td>
<td>-0.49</td>
<td>0.56</td>
<td>0.58</td>
<td>0.4</td>
<td>0.72</td>
<td>0.51</td>
</tr>
<tr>
<td>ConocoPhillips Oil &amp; Gas-COP</td>
<td>9.27</td>
<td>13.63</td>
<td>11.44</td>
<td>6.94</td>
<td>-10.6</td>
<td>3.29</td>
<td>7.35</td>
<td>8.04</td>
<td>6.23</td>
<td>7.79</td>
<td>7.69</td>
</tr>
<tr>
<td>Dow Chemical Co-DOW</td>
<td>6.37</td>
<td>9.83</td>
<td>8.14</td>
<td>6.12</td>
<td>1.23</td>
<td>0.6</td>
<td>2.91</td>
<td>3.46</td>
<td>1.21</td>
<td>6.39</td>
<td>4.9</td>
</tr>
<tr>
<td>Duke Energy Corp-DUK</td>
<td>2.65</td>
<td>3.29</td>
<td>3.02</td>
<td>2.53</td>
<td>2.65</td>
<td>1.95</td>
<td>2.27</td>
<td>2.81</td>
<td>2</td>
<td>2.33</td>
<td>1.92</td>
</tr>
<tr>
<td>General Electric Co-GE</td>
<td>2.37</td>
<td>2.3</td>
<td>3.04</td>
<td>2.98</td>
<td>2.18</td>
<td>1.36</td>
<td>1.48</td>
<td>1.79</td>
<td>1.95</td>
<td>1.95</td>
<td>1.97</td>
</tr>
<tr>
<td>H&amp;R Block Inc. Retail-HRB</td>
<td>11.65</td>
<td>8.51</td>
<td>-6.43</td>
<td>-4.7</td>
<td>8.84</td>
<td>9.05</td>
<td>7.78</td>
<td>5.4</td>
<td>9.45</td>
<td>10.29</td>
<td>12.39</td>
</tr>
<tr>
<td>Entergy Corp. Utilities-ETR</td>
<td>3.2</td>
<td>3.04</td>
<td>3.57</td>
<td>3.43</td>
<td>3.47</td>
<td>3.33</td>
<td>3.29</td>
<td>3.39</td>
<td>2.02</td>
<td>1.64</td>
<td>2.24</td>
</tr>
<tr>
<td>Hess Corp-HES</td>
<td>6.13</td>
<td>6.74</td>
<td>9.02</td>
<td>7.55</td>
<td>8.63</td>
<td>2.55</td>
<td>6.55</td>
<td>4.57</td>
<td>4.9</td>
<td>11.72</td>
<td>8.88</td>
</tr>
<tr>
<td>Hewlett-Packard Co. Technology-HPQ</td>
<td>4.64</td>
<td>3.13</td>
<td>7.78</td>
<td>8.51</td>
<td>8.25</td>
<td>6.72</td>
<td>7.32</td>
<td>5.57</td>
<td>-10.62</td>
<td>4.77</td>
<td>4.88</td>
</tr>
<tr>
<td>AVERAGE 20 COMPANIES</td>
<td>7.91</td>
<td>8.70</td>
<td>9.77</td>
<td>6.53</td>
<td>5.06</td>
<td>5.63</td>
<td>7.01</td>
<td>7.63</td>
<td>4.67</td>
<td>6.29</td>
<td>6.02</td>
</tr>
<tr>
<td>S&amp;P 500</td>
<td>2.40</td>
<td>2.69</td>
<td>3.11</td>
<td>2.17</td>
<td>0.73</td>
<td>1.96</td>
<td>2.82</td>
<td>3.14</td>
<td>2.85</td>
<td>3.29</td>
<td>3.27</td>
</tr>
</tbody>
</table>
7.4 Return on Invested Capital (ROIC).

Return on invested capital (ROIC) repeats the references of the previous ratios (Picture 3.4). Once more it agrees with the general curve of the S&P 500 and also ROIC for the sample of 20 green companies, is quite higher in relevance with S&P 500.

Again this ratio signifies the rather positive performance of the 20 companies’ sample in relation with the total 500 companies of S&P 500. Table 3.5 provides analytical data for every company’s ROIC and S&P 500’ for the defined time series

![ROIC Analysis Graph](image.png)

Picture 3.4 ROIC analysis from 2004 to 2013, Source: Bloomberg, Morningstar.com
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accenture PLC -(ACN)</td>
<td>48.08</td>
<td>58.39</td>
<td>53.2</td>
<td>62.42</td>
<td>73.64</td>
<td>58.87</td>
<td>62.57</td>
<td>68.11</td>
<td>63.88</td>
<td>72.13</td>
<td>53.35</td>
</tr>
<tr>
<td>Abbott Laboratories-ABT</td>
<td>16.88</td>
<td>16.53</td>
<td>8.55</td>
<td>14.47</td>
<td>18.02</td>
<td>18.06</td>
<td>12.59</td>
<td>12.84</td>
<td>15.0</td>
<td>6.9</td>
<td>8.26</td>
</tr>
<tr>
<td>Advanced Micro Devices Inc - AMD</td>
<td>4.76</td>
<td>5.54</td>
<td>-0.75</td>
<td>-33.76</td>
<td>-41.67</td>
<td>12.3</td>
<td>15.33</td>
<td>17.27</td>
<td>-32.75</td>
<td>2.8</td>
<td>9.57</td>
</tr>
<tr>
<td>Agilent Technologies Inc-A</td>
<td>8.03</td>
<td>8.55</td>
<td>62.75</td>
<td>13.84</td>
<td>15.94</td>
<td>0.52</td>
<td>11.26</td>
<td>16.35</td>
<td>17.72</td>
<td>10.49</td>
<td>10.32</td>
</tr>
<tr>
<td>Alcoa Inc-AA</td>
<td>7.18</td>
<td>7.57</td>
<td>12.17</td>
<td>12.34</td>
<td>0.82</td>
<td>-3.88</td>
<td>2.74</td>
<td>4.4</td>
<td>2.26</td>
<td>-9.5</td>
<td>-9.74</td>
</tr>
<tr>
<td>Autodesk-ADSK</td>
<td>34.89</td>
<td>45.7</td>
<td>30.39</td>
<td>30.37</td>
<td>13.88</td>
<td>4.09</td>
<td>13.75</td>
<td>16.34</td>
<td>9.13</td>
<td>7.89</td>
<td>5.87</td>
</tr>
<tr>
<td>Chevron Corp-CVX</td>
<td>25.78</td>
<td>21.83</td>
<td>22.59</td>
<td>23.05</td>
<td>26.61</td>
<td>10.61</td>
<td>17.4</td>
<td>21.68</td>
<td>18.68</td>
<td>13.46</td>
<td>11.8</td>
</tr>
<tr>
<td>Citigroup Inc-C</td>
<td>9.4</td>
<td>13.39</td>
<td>13.94</td>
<td>9.03</td>
<td>0.81</td>
<td>1.54</td>
<td>5.17</td>
<td>5</td>
<td>5.43</td>
<td>5.19</td>
<td>3.91</td>
</tr>
<tr>
<td>Dow Chemical Co-DOW</td>
<td>14.3</td>
<td>19.73</td>
<td>15.95</td>
<td>11.84</td>
<td>3.67</td>
<td>4.92</td>
<td>7.92</td>
<td>8.43</td>
<td>4.32</td>
<td>13.28</td>
<td>10.55</td>
</tr>
<tr>
<td>Duke Energy Corp-DUK</td>
<td>7.39</td>
<td>7.77</td>
<td>7.27</td>
<td>5.25</td>
<td>5.77</td>
<td>4.23</td>
<td>4.68</td>
<td>5.44</td>
<td>4.24</td>
<td>4.54</td>
<td>4.09</td>
</tr>
<tr>
<td>General Electric Co-GE</td>
<td>6.11</td>
<td>6.01</td>
<td>7.22</td>
<td>7.2</td>
<td>6.69</td>
<td>4.52</td>
<td>4.55</td>
<td>4.33</td>
<td>4.79</td>
<td>4.79</td>
<td>4.86</td>
</tr>
<tr>
<td>Entergy Corp. Utilities-ETR</td>
<td>8.04</td>
<td>7.53</td>
<td>9.06</td>
<td>9.04</td>
<td>8.83</td>
<td>7.82</td>
<td>7.99</td>
<td>8.64</td>
<td>6.49</td>
<td>5.1</td>
<td>6.09</td>
</tr>
<tr>
<td><strong>AVERAGE 20 COMPANIES</strong></td>
<td><strong>15.81</strong></td>
<td><strong>17.61</strong></td>
<td><strong>18.40</strong></td>
<td><strong>14.12</strong></td>
<td><strong>12.21</strong></td>
<td><strong>12.03</strong></td>
<td><strong>14.26</strong></td>
<td><strong>15.27</strong></td>
<td><strong>10.20</strong></td>
<td><strong>12.85</strong></td>
<td><strong>11.67</strong></td>
</tr>
<tr>
<td><strong>S&amp;P 500</strong></td>
<td><strong>5.14</strong></td>
<td><strong>5.45</strong></td>
<td><strong>6.23</strong></td>
<td><strong>5.11</strong></td>
<td><strong>2.11</strong></td>
<td><strong>5.08</strong></td>
<td><strong>6.61</strong></td>
<td><strong>7.36</strong></td>
<td><strong>-0.37</strong></td>
<td><strong>8.03</strong></td>
<td><strong>8.19</strong></td>
</tr>
</tbody>
</table>
7.5 Earnings per Share (EPS)

Earnings per Share provide a totally different picture than the previous studies (Picture 3.5). This time the sample of green companies does not follow S&P 500 earnings per share. On the contrary, it stagnates around zero, with small variances above and below the horizontal axis. As a monetary value of earnings per each outstanding share of company’s preferred stock, EPS is very much associated with the number of outstanding stocks of the company traded every period in the stock market. One other reason that can be contributed to, is the fact that implementation of green practices is often accompanied by enlarged operational costs and restricted investment prospects that derive from green investments. Thus a significantly lower EPS may occur. Table 3.6 provides analytical data for every company’s EPS and S&P 500’ for the defined time series.

![Earnings per Share %](image)

Picture 3.5 EPS analysis from 2004 to 2013, Source: Bloomberg, Morningstar.com
Table 3.6. Earnings per Share (EPS) time series from 2004 to 2013 Source: Bloomberg, Morningstar.com.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Accenture PLC -(ACN)</td>
<td>27.87</td>
<td>1.92</td>
<td>23.9</td>
<td>34.52</td>
<td>-7.92</td>
<td>9.02</td>
<td>27.82</td>
<td>12.94</td>
<td>28.39</td>
<td>4.13</td>
<td>16.57</td>
</tr>
<tr>
<td>4</td>
<td>Advanced Micro Devices Inc - AMD</td>
<td>45.58</td>
<td>60</td>
<td>15.56</td>
<td>22.12</td>
<td>33.26</td>
<td>35.25</td>
<td>42.22</td>
<td>3.13</td>
<td>18.74</td>
<td>14.32</td>
<td>-50</td>
</tr>
<tr>
<td>5</td>
<td>Agilent Technologies Inc-A</td>
<td>24.87</td>
<td>-8.45</td>
<td>-45.21</td>
<td>-79.07</td>
<td>19.11</td>
<td>23.25</td>
<td>34.89</td>
<td>46.91</td>
<td>14.74</td>
<td>-35.78</td>
<td>-12.24</td>
</tr>
<tr>
<td>6</td>
<td>Alcoa Inc-AA</td>
<td>37.96</td>
<td>-6.04</td>
<td>83.57</td>
<td>14.79</td>
<td>24.76</td>
<td>45.26</td>
<td>68.62</td>
<td>129.17</td>
<td>-67.27</td>
<td>-156.32</td>
<td>-209.09</td>
</tr>
<tr>
<td>7</td>
<td>Autodesk-ADSK</td>
<td>73.08</td>
<td>47.78</td>
<td>-10.53</td>
<td>23.53</td>
<td>-45.58</td>
<td>-68.75</td>
<td>260</td>
<td>35.56</td>
<td>-12.3</td>
<td>-6.54</td>
<td>-51.85</td>
</tr>
<tr>
<td>8</td>
<td>Baxter International Inc-BAX</td>
<td>-56.55</td>
<td>141.27</td>
<td>40.13</td>
<td>22.54</td>
<td>21.07</td>
<td>13.61</td>
<td>-33.43</td>
<td>62.34</td>
<td>7.73</td>
<td>-12.44</td>
<td>-11.21</td>
</tr>
<tr>
<td>9</td>
<td>Becton Dickinson &amp; Co.-BDX</td>
<td>64.12</td>
<td>56.5</td>
<td>5.78</td>
<td>19.11</td>
<td>27.79</td>
<td>11.88</td>
<td>10.02</td>
<td>2.37</td>
<td>-0.53</td>
<td>16.1</td>
<td>8.55</td>
</tr>
<tr>
<td>10</td>
<td>Chevron Corp-CVX</td>
<td>80.46</td>
<td>4.14</td>
<td>19.27</td>
<td>12.44</td>
<td>33.07</td>
<td>-55.1</td>
<td>80.92</td>
<td>41.77</td>
<td>-0.89</td>
<td>-16.74</td>
<td>7.58</td>
</tr>
<tr>
<td>12</td>
<td>Citigroup Inc-C</td>
<td>-4.68</td>
<td>45.71</td>
<td>-9.26</td>
<td>-83.29</td>
<td>-56.23</td>
<td>-37.98</td>
<td>-11.45</td>
<td>3.71</td>
<td>-32.78</td>
<td>78.28</td>
<td>-97.76</td>
</tr>
<tr>
<td>13</td>
<td>ConocoPhillips Oil &amp; Gas-COP</td>
<td>67.87</td>
<td>64.66</td>
<td>1.15</td>
<td>-25.26</td>
<td>28.32</td>
<td>85.14</td>
<td>135.19</td>
<td>17.72</td>
<td>25.08</td>
<td>9.82</td>
<td>1.21</td>
</tr>
<tr>
<td>17</td>
<td>H&amp;R Block Inc. Retail-HRB</td>
<td>-2.33</td>
<td>-22.02</td>
<td>-35.46</td>
<td>-46.58</td>
<td>-6.57</td>
<td>-1.38</td>
<td>-8.39</td>
<td>-32.06</td>
<td>77.53</td>
<td>8.86</td>
<td>5.56</td>
</tr>
<tr>
<td>19</td>
<td>Hess Corp-HES</td>
<td>34.6</td>
<td>24.76</td>
<td>52.51</td>
<td>-5.44</td>
<td>26.13</td>
<td>-68.65</td>
<td>185.02</td>
<td>-22.57</td>
<td>18.76</td>
<td>149.08</td>
<td>-28.85</td>
</tr>
<tr>
<td>20</td>
<td>Hewlett-Packard Co. Technology-HPQ</td>
<td>38.55</td>
<td>-28.7</td>
<td>165.85</td>
<td>22.94</td>
<td>21.27</td>
<td>-3.38</td>
<td>17.52</td>
<td>-10.03</td>
<td>5.78</td>
<td>25.47</td>
<td>-26.76</td>
</tr>
</tbody>
</table>

AVERAGE 20 COMPANIES

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>COMPANY</td>
<td>69.41</td>
<td>76.19</td>
<td>86.99</td>
<td>89.08</td>
<td>71.79</td>
<td>61.94</td>
<td>85.26</td>
<td>98.92</td>
<td>103.82</td>
<td>110.53</td>
<td>120.34</td>
</tr>
</tbody>
</table>
The outcome of the analysis provided a clear picture that indicates a significant positive relation between green and financial performance. This outcome generally concurs with the findings of previous researches as they described in the earliest literature review.

On the other hand, poor results in EPS validate market’s opinion on environmental business practices. Application of environmental business procedures often comes with enlarged operational costs and limited investment prospects that come from environmental investments. Markets tend to overreact on psychology terms and thus a negative reactions in stock prices may occur. Yet as past studies indicate, this is a short term phenomenon and eventually all these green procedures diffuse in the corporate body in the long term, allowing it to develop properly and achieve its financial goals.
Chapter 8 Conclusions and proposals for future research

This study provided a further research into the green–financial performance hypothesis. Its findings provided a further understanding on the need for greener business organizations. This need for going green, does not contend the financial reasons behind the business structure. Financial ratio analysis shown exactly that. Going green can contribute positively in corporate profits and growth. Short term discrepancies should not fear the markets. These are only temporary and natural as all organizational transformations. Eventually things take their course to normalization.

The need for sustainable businesses is deeper and affects all people. It reflects peoples’ fundamental needs for creation, growth and personal development. Only in a way that does not harm the natural environment.

Future research could be implemented in several directions. First, more extensive studies are useful to search the causes connecting “environmentals” to profitability and to define if these relations hold over time. The reliability of the green surveys data is also an important issue, as data from different sources have significant differences regarding how to evaluate the green business concepts and economic performance of a company. One other important aspect would be to research the actual appearance of green procedures in profits. How long does it take to write profits after the initial operating costs?

Finally another very interesting factor to investigate, would be the psychological effects of the markets and their negative reactions in the trading rooms and what could be done by green companies to obviate these effects.
9 Bibliography


25. Pat Hughes, Kathleen Hosfeld (2005),”The Leadership of sustainability” Center for Ethical Leadership” p.15


27. Search term “Financial Performance” Investopedia site, 2014


Financial Web Sites

1. Bloomberg.com


3. csimarket.com/help/About_us.php, 2014, CSI market website


5. financials.morningstar.com

6. yahoo.finance.com
Historical stock charts of 20 green companies (sample) and comparison with S&P 500 for the sample period, Source: Yahoo Finance:

Picture A.1 ACN and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.2. MMM and S&P 500 stock chart comparison, Source: Yahoo Finance
Picture A.3. ABT and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.4. AMD and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.5. A and S&P 500 stock chart comparison, Source: Yahoo Finance
Picture A.6. AA and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.7. ADSK and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.8. BAX and S&P 500 stock chart comparison, Source: Yahoo Finance
Picture A.9. BDX and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.10. CVX and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.11. CSCO and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.13. COP and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.14. DOW and S&P 500 stock chart comparison, Source: Yahoo Finance
Picture A.15. DUK and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.16. GE and S&P 500 stock chart comparison, Source: Yahoo Finance
Picture A.17. GE and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.18. GE and S&P 500 stock chart comparison, Source: Yahoo Finance

Picture A.19. HES and S&P 500 stock chart comparison, Source: Yahoo Finance
Picture A.20. HPQ and S&P 500 stock chart comparison, Source: Yahoo Finance
Bloomberg provides the following formulas for the calculations of performance ratios:

*Return on Capital (RR030)*

*Mnemonic: RETURN_ON_CAP*

Metric that measures the return that an investment generates for capital contributors. It indicates how effective a company is turning capital into profits.

**Industrial & Utilities**

Calculated as:

\[
\frac{\text{Trailing 12 M Net Income (Losses) + T12 Minority Interest + T12 Interest Expense * (1 - (T12 Effective Tax Rate / 100))}}{\text{Average of Total Capital}} \times 100
\]

**Banks, Financial & REITS**

Calculated as:

\[
\frac{\text{Trailing 12 M Net Income (Losses) + T12 Minority Interest}}{\text{Average of Total Capital}} \times 100
\]

**Insurance**

Calculated as:

\[
\frac{\text{Trailing 12 M Policyholders' Surplus + T12 Net Income (Losses) + T12 Minority Interest + T12 Interest Expense * (1 - (T12 Effective Tax Rate / 100))}}{\text{Average of Total Capital}} \times 100
\]

Where:

- Trailing 12 M Net Income is RR813, TRAIL_12M_NET_INC
- Trailing 12M Minority Interest is RR812, TRAIL_12M_MINORITY_INT
- Trailing 12M Interest Expense is RR804, TRAIL_12M_INT_EXP
- Trailing 12M Effective Tax Rate is RR712, TRAIL_12M_EFF_TAX_RT
- Total Capital is RR006, BS_TOT_CAP
- Trailing 12M Policyholders’ Surplus is RR713, TRAIL_12M_POLICY_HOLDER_SURPLUS

Average is the average of the beginning and ending balances. Trailing 12 month values use the latest 4 quarters, 2 semi annuals or annual.
**BEST EPS (BE008)**

*Mnemonic: BEST_EPS*

The BEst (Bloomberg Estimates) Earnings Per Share (EPS Adjusted) estimate returns Earnings Per Share from Continuing Operations, which may exclude the effects of one-time and extraordinary gains/losses.

The EPS GAAP estimate returns Reported Earnings Per Share (Before Extraordinary Items OR Bottom Line). Available for Broker estimates and Consensus: Standard, Reset Consensus, and 4 Week.

---

**Trailing 12M Profit Margin (RR836)**

*Mnemonic: TRAIL_12M_PROF_MARGIN*

Trailing 12-month profit margin, calculated with trailing net income and net sales for the most recent four quarters or two semi-annual periods.

Profit margin is net income as a percentage of net sales. Calculated as:

Trailing 12M Net Income / Trailing 12M Net Sales

Where,

Trailing 12M Net Income is RR813, TRAIL_12M_NET_INC

Trailing 12M Net Sales is RR800, TRAIL_12M_NET_SALES

---

**Return on Assets (RR028)**

*Mnemonic: RETURN_ON_ASSET*

BANKS/FINANCIALS/INDUSTRIALS/INSURANCE/UTILITIES/REITS

Return on Assets (ROA, in percentage) is an indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. Calculated as:

(Trailing 12M Net Income / Average Total Assets) * 100

Where:

Trailing 12M Net Income is RR813, TRAIL_12M_NET_INC

Average Total Assets is the average of the beginning balance and ending balance of BS035, BS_TOT_ASSET
Return on Common Equity (RR029)

Mnemonic: RETURN_COM_EQY

BANK/FINANCIALS/INDUSTRIALS/INSURANCE/UTILITIES/REITS

Return on Equity (ROE, in percentage) measures a corporation’s profitability by revealing how much profit a company generates with the money shareholders have invested. Calculated as:

\[
\text{ROE} = \left( \frac{\text{T12 Net Income Available for Common Shareholders}}{\text{Average Total Common Equity}} \right) \times 100
\]

Where:

T12 Net Income Available for Common Shareholders is T0089, TRAIL_12M_NET_INC_AVAI_COM_SHARE

Average Total Common Equity is the average of the beginning balance and ending balance of RR010, TOT_COMMON_EQY

Source: Bloomberg