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CORPORATE SOCIAL RESPONSIBILITY AND THE ADOPTION OF ECO-INNOVATIONS IN THE CONTEXT OF GREEN ECONOMY

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ACRONYMS

CED: Committee for Economic Development
CER: Corporate Environmental Responsibility
CFP: Corporate Financial Performance
CO₂: Carbon Dioxide
CSP: Corporate Social Performance
CSR: Corporate Social Responsibility
EI: Eco-Innovations
EIO: Eco-Innovations Observatory
EMAS: Eco-Management and Audit Scheme
EMS: Environmental Management Systems
EREI: Energy and Resource Efficiency Innovations
ERM: Enterprise Risk Management
EU: European Union
GHG: Greenhouse gas
GRI: Global Reporting Initiative
ILO: International Labour Organization
IPCC: Intergovernmental Panel on Climate Change
ISO: International Standard Organization
KPI: Key Performance Indicators
NGOs: Non-Governmental Organizations
OECD: Organization for Economic Co-operation and Development
RBV: Resource-Based-View Theory
R&D: Research and Development
SME: Small and Medium Enterprises
SRI: Socially Responsible Investment
ST: Stakeholder Theory
UN: United Nations
UNFCCC: United Nations Framework Convention on Climate Change
WBCSD: World Business Council for Sustainable Development

INTRODUCTION

The existence of a positive relation between the economic performances of firms and the good practices of governance is becoming clearer: the wealth of workers, of communities and, more generally, of the entire Planet is intrinsically connected to the wealth of business. Therefore, in this context, the *smart choices* are those which allow business to manage its actions in a pro-active way, keeping risks and opportunities under investigation.

In the globalized world, the global and local challenges, from climate change to food and water crisis, from growing unemployment to increasing social inequalities need solutions that must be conceived and shared between the public and the private sector. Thus, it is becoming increasingly evident that corporations – small, medium or big – must respond to this challenges, starting to move beyond basic responsibilities and adopting strategic behaviors. From this point of view, it is no more sufficient to have only profitable enterprises: it's time to have more responsible companies.

The changes in the global markets – which have progressively modified the conception of enterprise itself – the growing attention of business toward the environmental and social issues, favored by the changes in the role of customers or by the expanding influence of non-governmental organizations (NGOs) ready to do battle with multinational companies, are just some of the main elements which have fostered the debate on Corporate Social Responsibility (hereinafter called CSR). The globalization, particularly, has generated significant changes in the economic geography at international level, in the circulation and allocation of capitals, in the organization of work within the companies or in the attention towards environmental issues, such as pollution. In addition, in this interconnected world, where information and news can run instantaneously from one continent to another, companies are being watched by media and public opinion more than ever and therefore they have to work harder to protect their reputation and avoid damaged scandals.

In this respect, business has been interested by such significant changes in its own managerial and organizational culture, whose modifications have incrementally highlighted new duties and new social responsibilities.

Not long time ago, for example, the respect of companies toward the natural environment was only an ethic solicitation originating from minority sector of society. However, the growing tangibility of the problem of pollution supported by the recent increasing concern over climate change, has transformed an ethic instance in a powerful economic factor, able to influence the life and the prosperity of enterprises and to induce deep modifications to the conception of products and services and to the model of production itself (Azzone et al., 1997).

All this elements explain why nowadays CSR represents an element of extreme attention in the international arena. CSR is now seen, more than even before, as a mainstream idea and companies cannot ignore it. As stated in an article in the popular English newspaper *The Economist*¹, “a vast range of activities, which span from volunteering in the local community to looking after employees properly, from helping the poor to saving the planet, now comes under the *doing-good umbrella* of CSR. In this respect, big and medium companies want more and more to tell the world about their good citizenship, pushing out the message on their websites and in advertising campaigns”. Of course, for many aspects, CSR is a matter of trade-offs, just like all the other disciplines on business management, but its strategic potential to improve global social welfare and enhance the resilience of business activities cannot be underestimated.

According to the definition formulated by the European Commission in 2001, included in the *green paper* titled “Promoting a European Framework for Corporate Social Responsibility”, the CSR refers to the “*Responsibility of enterprises for their impacts on society and the voluntary integration of environmental and social preoccupations in all the commercial operations, in the decision-making process and in the relationship between the company and its stakeholders*”.

¹ <http://www.economist.com/node/10491077> This article belongs to a more comprehensive special report on Corporate Social Responsibility, written in January 2008

CSR represents thus a way to combine the typical goals of business, according to traditional economic theory, such as profit maximization, with other objectives not necessarily economic. The innovative element relies on the attention placed by firms towards the entire network of its stakeholder, even those who are indirectly concerned with those business activities a firm can establish mutual beneficial relationships with, reaching an efficient and fair balance between rights and responsibilities and thus generating a long-term value, both social and economical.

In the macro-economic context, marked by the threats of global warming and by the challenges which will be raised, there is therefore a particular need that all relevant actors, from multi-levels governments to individual citizens, would play a pro-active role in mitigating this negative externalities, and an important contribution will come from corporations, as mentioned above.

In an age of tension toward sustainable development and green economy, enterprises should voluntarily adopt stricter environmental and social standards, open themselves to a constructive and systematic dialogue with the interested stakeholders, and search the best solutions based on mutual cooperation and synergy. Moreover, companies, according to their financial assets, should implement and encourage the diffusion of those technological improvements, able to lead a global transition toward a model of *low carbon economy*².

Therefore, in this changing context, CSR is increasingly becoming the solution able to guarantee simultaneously the environmental resilience and the sustainability of business profitability. Depicted as a powerful engine of growth, CSR, indeed, is likely to increase the economic performances of companies that would adopt it through a better access to *green markets*, through a strong attraction for new customers or improvements in the external image and, at the same time, reducing their hazardous impacts on the external natural environment.

² A *low carbon economy* is considered a new economic model, capable of reducing the energy intensity of productive activities and the subsequent release of green house gas emission while ensuring, at the same time, a global achievement of sustainable development. This model (also named *zero carbon economy*) implies a primarily reassessment of the entire economic and social system and a shift from the actual technological regime to a more efficient one.

The empirical research has tried to identify appropriate indicators to measure the degree of business involvement in sustainable and responsible behaviors for a long time, but this has resulted in uncertain outcomes and confused conclusions. To this end, many studies have been pursued by academics, international organizations and think-tanks, aimed to identify the drivers of CSR and its impacts on financial performances, but results have been contradictory. The main obstacle lays in the fact that CSR is a multi-faceted topic, difficult to measure and to distinguish within the range of company's actions, and this impediment has been real, especially for the *social side* of CSR equation, because the related activities – such as the involvement of local communities, or the improvement of human capital – are more difficult to identify and to be used in empirical analysis. A positive connection could be easily found if we look, instead, at the *environmental side* of CSR.

The so-called Corporate Environmental Responsibility (hereinafter named as CER) defined as “the whole spectrum of responsibilities that a company undertakes towards the natural environment surrounding it” (Azzone et al., 1997), is considered, indeed, more measurable, even if there are still some empirical limitations. In order to measure the degree of firm's involvement in natural environment respectful behaviors, it is possible to consider as indicators the so-called eco-innovations (hereinafter EI), namely those innovations able to improve and provide benefits in the whole environmental domain. According to the definition adopted inside the Community Innovation Survey of 2008 ³, an environmental innovation is considered as “*a new or significantly improved product, process, organizing or marketing method which creates environmental benefits, compared to the alternatives.*” EI are particularly relevant in the context of *Green Economy*, as they involve the creation, diffusion and application of new products, processes and technologies which can help to achieve the fundamental decoupling of economic growth from environmental pressures, at the lowest possible cost, while allowing the implementation of adequate strategies of climate change *mitigation* and *adaptation* (OECD, 2011).

³ The Community Innovation Survey (CIS) is a biannual survey carried out by Eurostat on innovation activities in enterprises, which provides statistics also on environment-related innovations <http://ec.europa.eu/eurostat/web/microdata/community-innovation-survey>

Moreover, these innovations are also recognized to be important when they can lead to renewed entrepreneurs and business models, contributing to several social and economics benefits, through the creation of new markets (e.g. *green markets*) or the large-scale provision of new jobs (e.g. *green jobs*). Therefore, EI are widely acknowledged as one of the major driver able to foster productivity and improve economic performances, a key to create new business values while benefiting people and addressing global challenges.

In this respect, EI can be considered a suitable parameter for measuring the business involvement in CSR, even if, due to the existence of several elements which can influence the adoption of environmental innovations, the relationship between these two variables is not always unidirectional.

The main objective of the present thesis is to assess if, for a certain sample of enterprises, the implementation of a strategy of Corporate Social Responsibility would correspond to higher financial performances, measured through appropriate indicators of profitability. As it will be demonstrated in the following chapters, several studies have tried to shed light on the relationships between CSR and Corporate Financial Performance, but the results have been uncertain and not uniform, due to the presence of some biases (e.g. the choice of variables), to the lack of data consistency and homogeneity, or to the existence of some methodological errors.

Indeed, due to its multifarious nature, CSR is not an easy topic to measure, and data referring to the existence of a responsible commitment connected to it, are not easily available in established database, but mainly obtainable through the use of specific firm's surveys, conducted for the single purposes of a research (e.g. the CSR survey made by Poussing and Le Bas for Luxembourgish firms).

On the contrary, data on eco-innovations are easier to collect, because numerous database containing significant statistics are available. Solid data about environmental innovations can be found, for example, inside OECD database (measured as "patents in environmental technologies") or acquired through large-scale surveys, as it is for CIS 2008, which provides country/sector-specific statistics about innovations with environmental benefits.

In order to partially overcome the obstacle deriving from the difficult measurement of CSR, our empirical analysis will use French data on eco-innovations as a proxy indicator for CSR. The underlying hypothesis is that the implementation of eco-innovative behaviors by firms can be interpreted as the existence of a certain degree of strategic CSR commitment within the business boundaries, thus a strategic responsible attitude towards the environment and society in general. Indeed, a renewed companies awareness of the social and environmental impacts of their actions, introduced by CSR, is able to boost the activation of some entrepreneurship policies that would attribute an increasing relevance to firms' environmental performances and build up new internal competencies in green technological activities, thus leading them to increasing investments in green R&D aimed at generating eco-innovations (Ghisetti and Quatraro, 2013). Therefore the objective of the research is to assess the impact of eco-innovations on firms' financial performances, analyzing the degree of correlation. The underlying contribution of this work is to empirically enhance the strand of study which links CSR to financial performances. If there is a positive statistical significance between eco-innovations and the indicators of profitability, then it will be assumed that CSR can have a positive impact in improving financial performances of the adopting companies.

The present study will be organized in four chapters, following this structure:

The first chapter, titled "*The Evolutionary Pathway of CSR*" will address the topic of CSR from a theoretical point of view, with a focus on the historical evolution of the concept and the main theoretical approaches which have stimulated the debate since now.

The second chapter, called "*Inside CSR: the drivers, the practical instruments and the multi-dimensionality*" will highlight, instead, many different aspects of Corporate Social Responsibility: which are its main determinants, the common instruments used by companies to implement it, and how the institutional framework has evolved in order to encourage companies to adopt such behaviors, both at national and international level.

The third chapter, entitled “*Eco-Innovations and CSR: a renewed perspective*”, will focus on the basic aspects and characteristics of eco-innovations, whose diffusion represents a fundamental instrument to drive the economic-energetic transition toward a *Low Carbon Economy*. This chapter will look both at the definitional issues of EI and at the different methods of classification which are used in the literature. Moreover, this section will deal with the difficulties related with their measurement and will explore which are their main causes, with a specific distinction between the so-called *exogenous* and *endogenous* factors. Particularly relevance will be placed on the inducing action of environmental policy instruments and on the effect of internal organization measures (e.g. CSR and Environmental Management Systems) in spurring eco-innovations.

Thereafter, in the fourth section of the work, the empirical research will be proposed. The analysis, as already expressed, starting from a sample of French firms, will investigate the existence and the degree of correlation between the adoption of EI and the subsequent economic returns, measured through indicators of profitability. In order to measure CSR, the statistics related to these innovations will be considered as a proxy indicator of a responsible behavior by the firms. Using data coming from two merged datasets – one related to the balance-sheet data of a sample of French firms and the other originating from the Community Innovation Survey of 2008 – a statistical model of linear regression will be developed with the use of STATA software, with the main purpose to study the relation between firms’ financial performance and CSR, and supporting it with empirical relevance and statistical significance.

CHAPTER I

The Evolutionary Pathway of CSR

1.1. A BRIEF INTRODUCTION

CSR is an increasingly prominent theme in business and it is more and more conceptualized as an important voluntary measure which can be strategically used by a company in order to achieve a sustainable growth while addressing some societal and environmental needs.

In fact, CSR is believed to offer an important contribution to sustainable development because it offers incentives for corporations to act responsibly (Moon, 2007). Therefore, several firms around the world, have not only accepted the idea of CSR, but they have also started to consider it a core business strategy, vital to their success, recognizing that their long-term prosperity increasingly depends on the qualitative nature of its relations with the community of stakeholders and the environment in which it works.

Nevertheless, the idea of social responsible business is a relatively modern concept, born principally in the US in the first half of the twentieth century and universally promoted only in the '90s. During the last 60-70 years a lot of scholars and managers have devoted greater attention to the relevance of CSR and many of them have tried to analyze how the actions of business could be more compatible with the expectations of society and more respectful of the natural environment.

Especially, in the last two decades there has been the development of many empirical studies, aimed to demonstrate a positive correlation between socially responsible behaviors and corporate financial performance, market's value, competitiveness and reputation. In the 1990s, in fact, many scholars linked CSR with other theories to enhance the conceptual definition and by the end of the century the ideas of CSR were universally promoted.

The studies pursued by Lu and Liu (2014) and by Danilovic et al. (2015) demonstrate how the CSR concept has evolved in the academia, through an analysis of literature and bibliography over the past 40 years. If CSR was a merely a theoretical and ethical concept 40 years ago, then it has progressively drawn the attention of researchers from various disciplines, increasing its complexity, elaboration and progression in an always increasing variety of fields (Danilovic et al., 2015). Numerous definitions of CSR have been given and the academic theories have gone through a progressive rationalization (Lu and Liu, 2014).

The shift in the conceptualization of CSR did not occur instantly but it has been a gradual and arduous process and even today the studies on the subject are characterized by the lack of a shared theoretical framework, even if, as it will be subsequently shown in the chapter, the *Shared Value Vision* recently envisioned by Porter and Kramer and the logic of *Global Corporate Citizenship* seem to be the mainstream conceptualization in the modern debate.

Anyway, the rapid growth of the field has generated confusion as to what constitutes CSR, and even today a clear definition in the management literature does not exist. The multi-faceted nature of the topic is well described by the words of Carroll, one of the most prestigious scholars of the discipline (1999):

An eclectic field with loose boundaries, multiple memberships and differing training/perspectives; broadly rather than focused, multidisciplinary; wide breadth; brings in a wider range of literature

Hence, in order to better understand what CSR is, what its drivers are and how firms can implement it in a profitable way, it is necessary to start with an historical analysis of the existing literature. For this reason, a chronological reconstruction of the evolutionary path of CSR concept will follow, as well as an analysis of how lecturers and the managerial literature have faced this important subject during the years.

1.2. CSR: THE EMERGENCE OF A CONCEPT

The cultural roots of CSR date back to the beginning of the twentieth century, when in the US the pressures coming from public opinion pushed some famous industrialists to experiment the first forms of firm's philanthropy, through the mean of the so-called *Community Foundations*, such as the *Rockefeller Foundation* (1913) or the *Boston Pioneer Fund* (1928). Also the European experiences of the *social cities* or *social villages*, such as the Crespi d'Adda village or Valdagno project, aimed at improving the quality of life of workers inside and outside the firm's environment while reconciling their mutual interests, date back to this period. All these experiences showed how the businessmen of the period started to regard the interdependence between firm and society, as a vital element for the firm's growth.

Nevertheless, it was only in the 50's and 60's that the awareness related to the existence of a social role of enterprises started to be studied.

In most of CSR literature (Preston, 1975; Carroll, 1999; Lee, 2008) there is a convergence on the name of Howard Bowen as the *father of CSR*. His book edited in 1953 "Social Responsibilities of the Businessman" is considered the first attempt to theorize the relationship between corporations and society (Lee, 2008). Bowen defined CSR as "*the obligation of businessmen to pursue policies, to make those decisions, or to follow the line of action which are desirable in terms of the objectives and values of our society*" (Carroll, 1999). Bowen thought that the position of great influence and the consequences of businessmen decisions, urged them to consider social aspects and responsibilities. In this way he conceived CSR as a complementary and corrective measure for some social failures and concentrated his attention on the institutional changes which could "*force, persuade and favor*" the rise of a new concept of business responsibility (Carroll, 1999).

Following Bowen's ideas, in the 1950s and 1960s there was a proliferation of definitions of CSR which tried to formalize its meaning, even if the attention remained focused on large companies characterized by a progressively wide range of action. In the same period the legal environment in the US became more aware about the damaging actions of business (Klein, 2014) and numerous legislations were enacted in order to regulate, for example, the pollutant behaviors or to protect consumers and employees.

Some examples of this legislative turmoil were for example the Fair Packaging and Labeling Act (1960), the Equal Pay Act & Clean Air Act (1963), the Water Quality Act (1965) or the Occupational Safety and Health Act (1970).

An important academic debate emerged among those authors who supported the existence of some connections between business and ethics and those who thought that this link was impossible.

The first group, composed by important authors as Keith Davis, William C. Frederick and Joseph William McGuire, accepting Bowen's assumption of *corporate obligation to society*, supported the fact that profits could be neither the first purpose nor represent the only indicator of a correct management.

Davis, for example, in his famous "Iron Law of Responsibility" defined CSR as "*businessmen decision and actions taken for reasons at least partially beyond the firm's direct economic or technical interest*" (Carroll, 1999), stressing the fact that social responsibilities of business were consistent with the extent of their social power. Frederick in his work claimed, instead, that "*the economic meaning of the production should be intended as the possibility to enforce the overall socio-economical welfare and the social responsibilities of a company must be used in order to satisfy broader societal issues*" (Frederick, 1960). Also McGuire contributed to the on-going debate and in his book "Business and Society" stated that "*businesses do not have only legal and economical obligations but also duties in respect of the society in which it operates*" (Lee, 2008).

All these definitions pointed out the fact that firms and companies had responsibilities of different nature towards the societal and natural environment, but none of them seemed to offer an exhaustive and concrete definition of how implementing those CSR activities. CSR was still an embryonic concept, but the credit of these authors was nevertheless important.

On the other side, instead, the second group of theorists was represented by opponents and critics of CSR paradigm, who challenged the validity of Bowen's ideas (Lee, 2008). Among them, the most prominent objection to CSR arrived, in particular, from the arguments proposed by the Nobel prize winner for Economics, Milton Friedman, in 1962, whose impact on the macro-economic debate has been relevant over the years.

1.2.1. FRIEDMAN: CSR AS A SUBVERSIVE DOCTRINE

In his volume “Capitalism and Freedom”, published in 1962, Milton Friedman defined the theory of CSR as subversive. According to him, “*few tendencies could threaten the foundations of our free society more than the acceptance from the managers of a social responsibility which looks beyond profits*” (Friedman, 1970). In this neoclassical view, the firm was considered as a black box in which the leading actors were the market forces and the entrepreneurs, considered as agents equipped with a form of objective and absolute rationality. In this representation, the first and foremost responsibility of the company was to maximize profits and the shareholders wealth, thus leaving the social problems to politicians and civil society (Friedman, 1970). In this respect, a firm did not have any ethical obligations despite the ones towards the shareholders. If a manager had directly invested the money of the company in some environmental and societal causes, then a complicated situation could raise, because this could force the company to add a cost, an additional tax on the shareholders. A managerial decision to sacrifice the firm’s profits in order to achieve some social objectives such as promoting employment, eliminating discriminations or avoiding pollution, would violate the sovereignty of both the shareholders and the customers, causing the forcing of the price mechanism (Mocellin, 2011). With this conception, Friedman conceived the idea that companies had to engage only in those activities which could help to increase their profits, and this was represented through the well-known statement “*the business of business is business*”.

According to the neoclassical view, it was always the search for the profit to guide the behavior of the firm, and the activities of CSR were only an instrumental tool, nothing more than answers dictated by external market forces (Lee, 2008). The pursuit of the profit was the real *responsible act*, because able to produce richness and welfare at the same time. In this context, the ethics, instead of being a precondition or a guideline for the economic action, was more considered as its consequence. Friedman indicated CSR as a self-serving behavior on the part of managers and in this sense he considered CSR as a cape worn by some businessmen only to justify some hypocritically action in the interest of the firm (Mc Williams and Siegel, 2006).

Furthermore, in his opinion the corporate managers were self-interested *homo economicus*⁴ and they did not have the right skill and expertise to deal effectively with social problems (Mocellin, 2011).

The ideas of Friedman have influenced the behaviors of corporations for many years and they have been an integral part of the theoretical background for the promotion of the deregulated capitalism in the 80's. In fact, when Reagan got the power in 1980, he promoted a progressive and massive liberalization of capitalism and economic activities and, as consequence, the results achieved in the previous year for the protection of the environment or for the wellbeing of workers were instantaneously reduced. The companies no longer needed to take care of their actions toward the environment or the social issues linked to their activities (Klein, 2014). Producing more goods and services or expanding markets was now more important, thus making CSR projects progressively becoming nothing more than "*window dressing*", as corporations attempted to create positive public images without necessarily modifying their problematic business activities (Klein, 2014). According to this thinking, any requirement for social or environmental improvement – such as the reduction of pollution and wastes – would set a constraint on the corporation, because "*adding this to a firm that is already maximizing profits would have raised its costs and reduced its profits*" (Porter and Kramer, 2011).

This perspective shaped the firm's strategies especially during the '70s and the '80s, when many companies excluded social and environmental considerations from their economic thinking. In that context, CSR was treated as a necessary expense and considered more as a reaction to external pressure, mostly used as a risk management tool or as philanthropic donation to improve firm's reputation. Business and society considered each other more as opposed and isolated, with specific and separated functions to fulfill. Nevertheless, the research on CSR did not stop after Friedman's publication and many other authors continued to investigate the topic, with the aim to obtain more precise conceptualizations and give clear, rigorous formalization to the CSR concept.

⁴ *Homo Economicus* is a fundamental concept of classical economic theory, portraying humans as consistently rational and self-interested agents who attempt to maximize utility as consumers and profits as producers.

1.2.2. THE '70s: A BREAKTHROUGH FOR CSR DISCOURSE

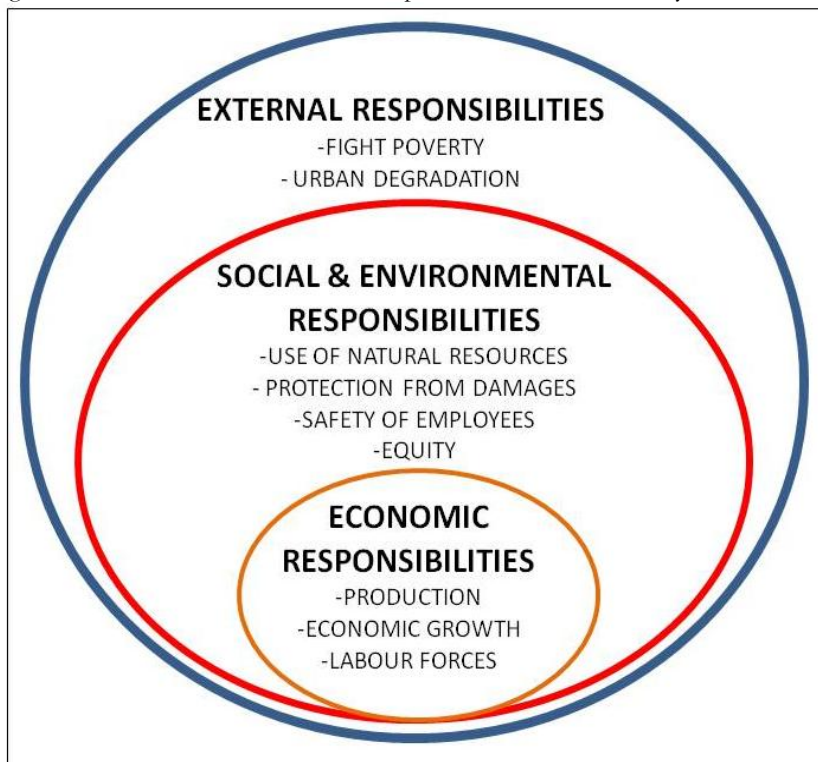
As showed in the previous paragraphs, the two decades following Bowen's publication were mainly characterized by the controversies over the political and social legitimacy of CSR (Wartick and Cochran, 1985). The promoters of CSR on one side and Friedman's *disciples* on the other, could not carry out a constructive dialogue and very little theoretical progress was achieved. The primary cause of such impasse over CSR was that their underlying assumptions about firms, economic behavior of corporate managers and the roles of societal institutions were radically different, and neither side was willing to consider the question from an alternative perspective (Lee, 2008).

At the beginning of the '70s, the persistence of some skepticism about the necessity to introduce CSR within corporate operations still persisted in some managerial environments, but most of the contributions, even if heterogeneous, agreed that socially responsible companies had principally to act voluntarily to conform to CSR paradigms, beyond legal prescriptions (Perrini et al., 2006). In particular, during those years, significant contributions to the conceptual development of CSR, mainly came from two studies.

The former was an article written by Wallich and McGowan in 1970 titled "A new Rational for Corporate Social Policy" which dealt with the question of how to reconcile the social and economic interests of corporations. The authors provided a *new rational* able to uphold CSR without compromising stockholder interests, recognizing that, due to the fact that the meaning of stockholders interest had been altered, CSR's activities could be then considered to be consistent with stockholders long term interest. By the '70s in fact, most of stockholders owned shares in not just one company, but in many companies to spread the risk. Therefore, they were not interested in maximization of profit in just one company as against the others where they owned shares, but they would prefer to achieve social optimization through a joint profit maximization: in this sense this maximization had to occur in all the companies in which they owned shares and thus CSR could be implemented in order to achieve that objective (Wallich and McGowan, 1970).

The latter important study instead, was the publication commissioned by the Committee for Economic Development of US titled “Social Responsibility of Business Corporation” in 1971. According to the content of the work “*Business is being asked to assume broader responsibilities to society than even before and to serve a wider range of human values. As business exist to serve society, its future depend on the quality of management’s response to the changing expectations of the public*” (Carroll, 1999). In order to expose its idea of CSR, the CED built a model made up of three concentric circles, as illustrated below (Figure 1), in which each circle contained some required responsibilities to be fulfilled.

Figure 1. Concentric circle model of responsibilities as indicated by CED



Source: re-elaboration from the author

Most of the research in the 70’s, conceptualized CSR as something supporting the corporation’s long-term interest by strengthening the environment which corporation belonged to. Those years were characterized by changes connected with the emergence of renewed needs of customers and by the increasing competitiveness at the international stage, thus a new attention was placed on the role of companies toward the expectations of the society.

In this context the main research was no longer focused on whether corporations should engage in CSR activities or not, but it started to look more on the content and the implementation of those CSR's activities non conflicting with corporations' fundamental interest, attempting to make the managerial outcomes more explicit (Lee, 2008). The theories thus tried to give clear, rigorous formalization to the CSR concept and to investigate the existence of a relationship between CSR and another important concept, called CSP or *Corporate Social Performance*. There were numerous attempts to explain this connection and an important breakthrough came in 1979, with the work of Archie B. Carroll.

1.2.3. CARROLL AND THE "CSP MODEL"

Archie B. Carroll represents one of the main important theorist who tried to deeply define the idea of CSR and its link with the performance of business.

In his article of 1979 "A three dimensional conceptual model of corporate social performance" he conceived social responsibility of business as "*something which encompasses the economic, legal, ethical and discretionary expectation that society has of organizations at a given point of time*" (Carroll, 1979). His main idea was that firms have responsibilities towards the society, which go further beyond the requirements imposed by law. His model did not treat the economic and social goals of corporations as incompatible *trade-offs*, rather he proposed an integrated framework of total social responsibility of business which included the corporate objectives. According to Carroll, the financial performance and a deeper social commitment of a firm, did not have to be necessarily decoupled because the accomplishment of one did not exclude the achievement of the other. Carroll conceived CSP to be characterized by three discretionary categories which were integrated inside the firm strategy: an economic responsibility, a legal responsibility and a discretionary one.

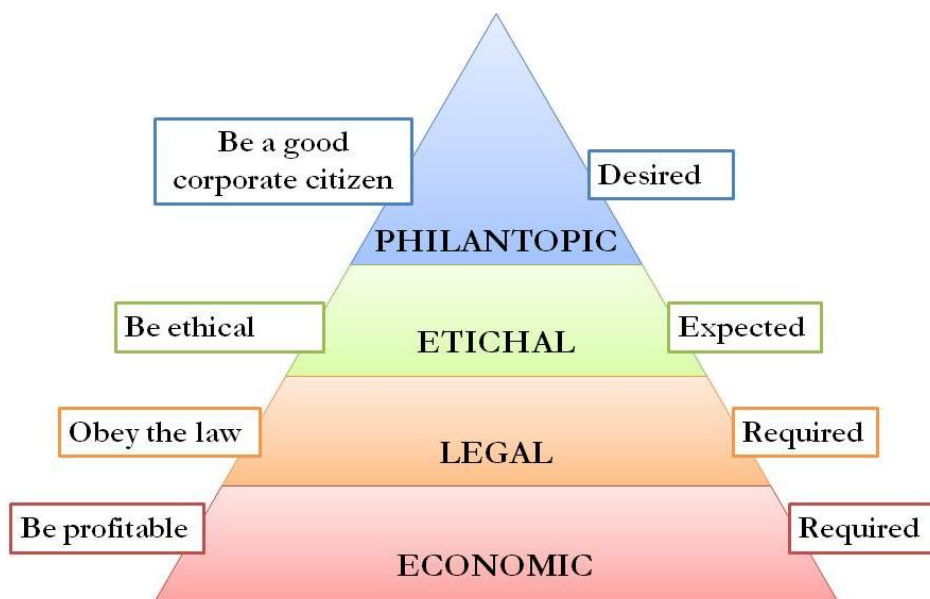
The *economic responsibilities* were the fundamental ones and they implied that a company should continue to supply the society with products and services while increasing its profits.

The *legal* category represented, instead, the legislative and behavioral arena, inside which companies had to act. In fact, a firm who aims to satisfy its economic mission (profit) has to act both under the normative architecture created by the State and in the ethical framework beyond the requirements imposed by law, thus respecting the ethic responsibilities expected by the entire community.

Finally, the *discretionary* component included those voluntary choices adopted by the organization and oriented to the society, guided by the desire of business to be committed in different societal roles whit a strong strategic significance (Carroll, 1979). Belonging to this last category there were, for example, the philanthropic contributions, the training courses provided for the unemployed, or the contributes supplied for financing arts or education. According to this last responsibility, the firm had to act as a “good corporate citizen”.

Carroll rectified this conception firstly in 1983, when he replaced the discretionary category with philanthropic and voluntary responsibilities, then in 1991, when it proposed the famous representation of its *four-part CSR model* using a hierarchical pyramid construct, as indicated in the following depiction (Figure 2)

Figure 2. The Pyramid of Corporate Social Responsibility



Source: Re-elaboration of the author from A.B. Carroll (1991)

Carroll offered a framework through which a corporation's strategic response to a social issue, could be defined and assessed. According to the author the Corporate Social Performance implied "*the simultaneous fulfillment of these different kinds of responsibilities*" (Carroll, 1979). In a managerial perspective, social responsible companies had to act in order to obtain sufficient profits while respecting the obligations of the laws, implementing some ethical behavior and acting as *good corporate citizens* (Carroll, 1999). The implementation of these four responsibilities could vary across firms and depended on the dimension of the company, on its business management philosophy and on the general macro-economic situation.

Undoubtedly Carroll's model played an important role to promote the debate on CSR (the four dimensions model, for example, meant the point of departure for the further elaborations of the *Global Corporate Citizenship* perspective) and became one of the most widely cited articles in the field of business and society (Danilovic, 2013). However, despite all efforts to make the conceptualization more useful (Wartick and Cochran 1985; Donna Wood, 1991) the model still remained complicated and difficult to evaluate because it provided no useful methodology to obtain data, organize and analyze them, and also lacked the capacity to measure and empirically test CSR.

1.3. CSR AND THE STAKEHOLDER THEORY

In the '80s the question of why some companies persistently performed better than others, produced a vast amount of research on the side of strategic management. The search for the resolution of this question overlapped with a fundamental transition from a *shareholder perspective*, mainly oriented to the creation of value for the shareholders, to a *stakeholder perspective* in which the achievement of spread benefits for all the stakeholders was considered as the main purpose.

The climax which marked this passage was the development of the so-called *Stakeholder Theory* (hereinafter ST) formulated by Edward R. Freeman in 1984.

This theory was formulated in response to the weaknesses of Friedman's minimalist theory – in which the firm was considered to be responsible only toward the shareholders – and proposed a renewed perspective of the role of business within the societal framework (Mocellin, 2011). Freeman with his work “Strategic Management: a Stakeholder Approach”, has been the first to focus the attention on the important role of stakeholders, which defined as “*those groups or individuals who can affect or are affected by an achievement of an organization's purpose and who have a legitimate interest or claim on the firm*” (Freeman, 1984). According to this vision, a company had wider responsibilities, which could involve the welfare of the stakeholders interested in the company's activities.

This group of stakeholders was a mix of different categories, which could diversify from one company to another and which included suppliers, clients, workforces, shareholders, funders or the local community of reference.

Through this perspective, it was acknowledged that a business did not act in an “empty space”: instead, its operations were conducted in a context characterized by a multitude of subjects, whose interests were influenced by business' operations and whose decisions, in turn, could interfere on the decision-making process and on the definition of strategic objectives (Freeman et al., 2007).

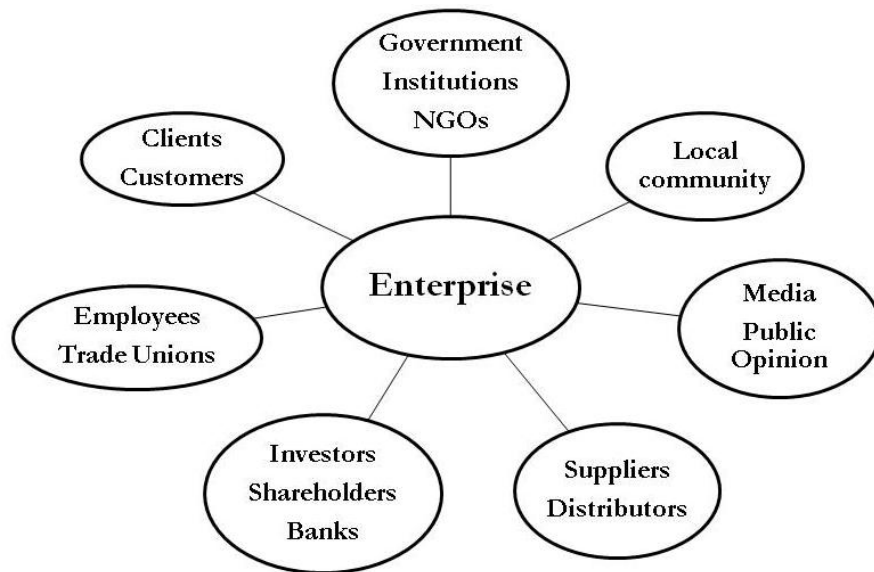
The capacity of a firm to generate sustainable wealth over time was claimed to be determined by the relationship with critical stakeholders.

Within the stakeholder framework, the differences between the social and economic goal of corporation were no longer relevant, because the central issue was the survival of the corporation, affected by all the stakeholders. Thus, according to the ST, the real objective of a company was to coordinate the interests of all the affected groups and strengthened the connections with them, because, if these were missing, the groups might withdrew their support from the firm (McWilliams and Siegel, 2006). The ST represented, therefore, the most incisive response to moral minimalism of social responsibility previously introduced by Friedman because it started the issue of social impact caused by economic activities without underestimating the importance of economic issues of profit's growth (Mocellin, 2011).

Moreover, the ST considered another important aspect, totally ignored by the neoclassical vision, which was the fact that a firm could be considered as a fair balance between the individual's interests – with their utility maximization – and group's interests (Freeman et al., 2007). In order to guarantee this balance, the figure of manager became therefore fundamental: the *stakeholder management* was, in fact, tasked to guarantee the achievement of a good level of satisfaction to everybody in accordance with a *win-win* outlook (Sacconi, 2005). The engagement of all the stakeholders, through the *stakeholder auditing*, was thus considered as a functional instrument for the business strategy in order to create values and promote a broader business governance.

The management, in this sense, could track, for example, a *stakeholders map* by identifying and classifying all the actors which could be affected by firm's activities, as represented in figure 3.

Figure 3. Stakeholders' mapping



Source: re-elaboration of the author from Freeman et al. (2007)

Because of the emphasis set on the relationships between stakeholders and firms, and the foundation that recognized the intrinsic value of the interests of non-shareholding stakeholders (Donaldson and Preston, 1995) the ST gradually moved to the core of research in business and society relations.

Moreover, ST started to be associated with a concept considered complementary to CSR: the already discussed concept of CSP, defined by Wood in 1991 as “*A business configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm’s societal relationships*” (Wood, 1991). In this sense, Stakeholder management approach showed that CSP was an unavoidable consequence of the critical interdependencies that existed among the firm, its employees, customers, investors, communities and constituencies in general. As a result, adopting socially responsible behaviors and pursuing corporate social performance was therefore a crucial strategy, in order to manage relations with both environment and stakeholders and deal with their demands (Perrini, 2002).

The connection between ST & CSP was reinforced especially by three articles which appeared in 1995 in the *Academy of Management Review*.

The first was the paper of Clarkson, titled “A stakeholder framework for analyzing and evaluating corporate social performance”, in which the author applied the stakeholder model to his ongoing research on CSP, making few enhancements of the model itself. Clarkson distinguished between primary and secondary stakeholders: the primary, defined also *Risk Bearers*, were those defined as essential for the survival of the company which had an economic interest in the firm activity, such as customers and suppliers; the secondary were instead those who were not considered so much essential for the organization, such as medias and NGOs, but who were able, at the same time, to influence and mobilize the public opinion in favor or against the firm. According to Clarkson, the survival and the success of a company relied principally on the abilities of managers to create enough richness, value and satisfaction for all the different stakeholders, both primary and secondary (Perrini, 2002)

The second important paper was the one by Jones, “Instrumental stakeholder theory: a synthesis of ethics and economics”, which was more instrumental in nature. Jones thought that, companies involved in repeated transactions with stakeholders on the basis of trust and cooperation, would have been more motivated to be honest, trustworthy, and ethical, because these ethical behaviors will have enabled them to achieve a competitive advantage (Jones, 1995).

The third relevant paper, instead, was written by Donaldson and Preston (1995) and titled “The stakeholder theory of the corporation: Concepts, evidence and implications”. The two authors stated the existence of a triple significance in the ST, related by a concentric connection: a *descriptive* accuracy, an *instrumental* power and a *normative* value. According to them, the ST was therefore a complete managerial theory and a proper stakeholder management which would lead the company to the achievement of wider corporate targets.

Following the publication of these articles, the attempt to adapt CSR to the stakeholder framework forced researchers to specify the concept more clearly, by looking at the relations that a firm was engaged in. The theory offered, in fact, “*a new way to organize thinking about organizational responsibility* (Jonker and Foster, 2002) and therefore had some important implications on CSR’s research. This specification of CSR induced the creation of many new categories of CSR, reflecting the wide range of stakeholder relations and interests. Therefore in the ‘90s the meaning of CSR was expanded and numerous different aspects started to be investigated by the academia, especially by the strategic management scholars.

1.4. THE ‘90s: STRATEGIC CSR

As showed, the concept of CSR evolved substantially during the last decades of twentieth century. In particular, the ‘90s were a fertile ground for the development of new ideas and perspectives in the domain of responsible business and CSR saw an *institutionalization* by the international agencies such as UN, ILO, the World Bank and the OECD, which started to release guidelines in order to link the concepts of CSR and sustainability to public policies. In those years, an important process of the *Europeanization* of CSR also started. Until then, in fact, CSR was largely an American construct, rooted in the historical role played by business in American capitalism, but in the ‘90s the growth of interest in CSR took place also in Europe, and since the inclusion of CSR in the European Political agenda – as one of the most relevant sources of competition for the entire economic system – each country’s interest has grown exponentially.

In that period the globalization process began to spread all around the world and as a consequence, business firms started to operate in a complex and uncertain environment, calling for a fresh view concerning their role. Moreover, in the moving from the '80s to the '90s, the environmental emergency and the diffused attention toward the protection of natural resources stimulated an increasing attention of the public opinion, the civil society's groups, NGOs and citizens, accompanied by an increased number of important events connected to environmental subject such as the signature of the *Montreal's Protocol on Substances that Deplete the Ozone Layer* in 1987 or the formulation of the idea of *Sustainability* and *Sustainable Development*, conceptualized within the famous *Bruntland Report "Our Common Future"*.

This historical moment was associated with a change in the meaning of CSR. In the '90s, CSR started to be considered no more as a moral philanthropic responsibility of corporate managers for *greater social good*, but more as a firm strategy to enhance the relationship between management and stakeholders and thus improving the competitive advantage of the company. The changes in the institutional and social environment, spurred researchers to better rationalize the concept of CSR by focusing on managerial issues at the organizational level and broadening the scope of CSR. Relevant to this change was, for example, the approach of *Triple Bottom Line*, brought by John Elkington in 1997 with his book "Cannibals with forks: the Triple Bottom Line of 21 Century Business", which – based on the triple statement *Persons, Planet and Profit* – replaced the previous Carroll's model of three-dimension (Fiorani et al., 2012). According to Elkington, enterprises, while doing business, had to pay attention to three different dimensions in order to achieve long-term success: an *environmental* dimension, considering the polluting emissions, the consumed energy and the management of natural resources; a *social* dimension with a focus on the working times, the employee's health and safety and the working conditions; an *economic* dimension with an attention to the rules of corporate governance and to the responsibilities of the board of directors.

Alongside this conceptual evolution there was a progressive convergence between the concepts of CSR and the one of Corporate Financial Performance (CFP). On the one hand, the idea of CSR expanded to envelop economic and social issues on macro-level as well as organizational questions; on the other hand, the issue of CFP started to include together, both social and economic interests (Lee, 2008).

Therefore, the rationalization of CSR and the convergence between CSR and CFP made the concept of CSR much more attractive to corporate managers and to researchers, and helped the diffusion of CSR among an increased number of corporate actors (Vogel, 2005).

1.4.1. THE RESOURCE-BASED-VIEW THEORY

It was in this stimulating context that new approaches to CSR started to be diffused. One of these, was the *Resource-Based-View* theory (RBV), firstly defined by Barney (1991) and then applied to CSR by Hart in 1995. According to this perspective, the competitive advantage of a firm principally relied on some firm-specific assets which could be mainly divided in *tangible* assets – considered as visible and quantifiable resources (equipment, plant, machineries, financial and technological resources) – and *intangible* assets – considered instead as those firmly-rooted values in the business culture, complicated to be imitated and replicated by competitors, such as the human capital, the internal business knowledge or firm’s reputation. In this respect, firms were different because they possessed skills, capacities and competencies which were unique, deriving from different choices and paths, and the ability of combining and aggregating them, especially the intangible ones, represented one of the core competence, base of their competitive advantage (McWilliams and Siegel, 2006)⁵. The RBV theory, moreover, underlined the fact that these capabilities had to be “dynamic”, in other words, able to adapt to fast environmental changes. Teece et al. in 1997, defined the conception of dynamic capabilities as “*the firm’s ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments*” (Teece et al., 1997). Therefore, in situations characterized by rapid technological changes, the managers needed to act in an innovative way, in order to face the emerging challenges in a responsive and prompt way. In this context, the existence of a link between the RBV’s theoretical formulations and CSR became therefore clearer, especially because this latter element could be considered as a strategic intangible asset, difficult to be imitated if rightly implemented in a strategic level.

⁵ The reputation – enhanced with a right campaign of communication – or a trustful interaction with the stakeholder group, are some examples of how these intangible assets could constitute the source of an economic advantage.

One of the first paper which tried to apply RBV framework to CSR was the one of Hart in 1995, who focused on the environmental aspects of social responsibility, asserting that, for certain types of firms, the environmental responsibility specifically – meant as the implementation of some strategies of pollution prevention or increased productivity and efficiency – could have constituted a resource for the achievement of a sustainable competitive advantage (Hart, 1995).

1.4.2. CSR AND THE UNSETTLED ISSUES

Starting from RBV's approach, the research also started to focus on the effort to tie up CSR and Corporate Financial Performance from different theoretical angles. The direction of empirical studies moved from basic research on what CSR was, to applied studies attempting to prove and explain the tight association between CSR and the financial performances of selected corporations. This perspective looked at CSR principally from the side of business, and it is better known as *Theory of the firm*. Russo and Fouts, for example, in 1997 tested the link between CSR and financial performance, using firm-level data on environmental and accounting profitability, and found that firms with higher levels of environmental performance obtained subsequently, superior financial results. Reinhardt (1998) also tried to explain this connection, coming to the conclusion that firms engaging in a CSR-based strategy could only generate an abnormal profitable return if they could prevent competitors from imitating their strategy (Reinhardt, 1998). McWilliams and Siegel (2001) tried to assess the impact of CSR activities on profitability using a regression analysis model and they presented a supply/demand perspective on CSR, inside which the firm's ideal level of CSR investment could be determined by cost-benefit analysis.

According to them *"there should be some level of CSR able to maximize profits while satisfying the demand for CSR from multiple stakeholders"* (McWilliams and Siegel, 2001).

Although all this theoretical conceptualization brought CSR and CFP closer, the relationship was not unequivocally verified, with largely inconclusive results (Margolis and Walsh, 2003). Even if CSR's concept started to be rationalized and made more concrete and measurable, there still were numerous unsettled theoretical and empirical issues, relating to strategic implication of CSR.

These included for example: a clear and universally accepted definition of the concept; the identification of differences in CSR practices across countries and firms; the classification of motivations and drivers underlying CSR activities; the measurement of the demand and the cost of CSR or the identification of practical and management instruments for implementing CSR (McWilliams and Siegel, 2006). Some of these issues are, nowadays, still unresolved, but in the last fifteen years a progressive development has been made in order to better conceptualize the framework of CSR. On one side some firms have started to drastically reconsider their position towards the society and the natural environment, responding to pressures coming from different stakeholder and starting to conceive CSR as a central asset of their strategy. On the other side there has been an important change in the mindset of political institutions and stakeholders (clients and customers for example) which have lead to the creation of economical frameworks, stimulating for those practices (green markets). Moreover, the naissance of institutionalized platforms inside which promoting dialogue about CSR (e.g. CSR Europe or Global Compact), the diffusion of international standards on the subject (e.g. SA 8000, ISO 26000) and the dissemination of some accounting practices, have all incentivized the adoption of responsible practices across businesses. However, in this recent shift the contribution of the academia has been fundamental and some of the critical issues – as for example the need for a better measurements of CSR or the lack of objective behavioral measures – have been partially resolved. In this evolutionary path, different dynamics, which have innovated the logics of CSR, have been recently promoted in the literature. Among them, the *Shared Value Approach* promoted by Michael E. Porter and Mark R. Kramer or the conceptualization of *Global Corporate Citizenship* by Schwab, are between the most relevant.

1.5. PORTER AND KRAMER: CREATING SHARED VALUE

Michael Porter, professor at Harvard University, started to write about the relationship between firms and environment in the early '80s, when he published an article titled "Competitive Strategy", inside which he considered that the relations between firms and their environment, intended as the totality of social interactions, were marked by a substantial dependence of companies.

However the most important incentive to CSR debate coming from the American professor was probably the article published in 2006, written with his colleague Mark Kramer and titled “The Link Between Competitive Advantage and Corporate Social Responsibility”. The relevance of this contribution laid mainly in the fact that the authors introduced a new framework, through which companies could identify both their positive and negative effects on society (Porter and Kramer, 2006). The need of the authors to identify a new approach to corporate responsibility resulted from the fact that since then, most of the publications on CSR rarely offered a coherent and coordinated framework for CSR activities, while they focused more on the tension between business and society rather than on their interdependence. The CSR’s literature used to aggregate anecdotes about uncoordinated initiatives and philanthropic activities disconnected from the company’s strategy, in order to exhibit a general company’s social sensitivity. Indeed, both the most basic traditional corporate philanthropy and the branch of risk management in the ‘80s, considered CSR as a defensive behavior implemented by firms in order to protect their reputation from the outside. Companies, whose reputation had been damaged by scandals or by environmental disasters – such as the explosion at the Bhopal pesticide factory or the *Exxon Valdez* oil spill – responded to this issues by allocating money to worthy causes and by trying to manage the risks, talking to NGOs and to governments, creating codes of conduct or committing themselves to more transparency in their operations.

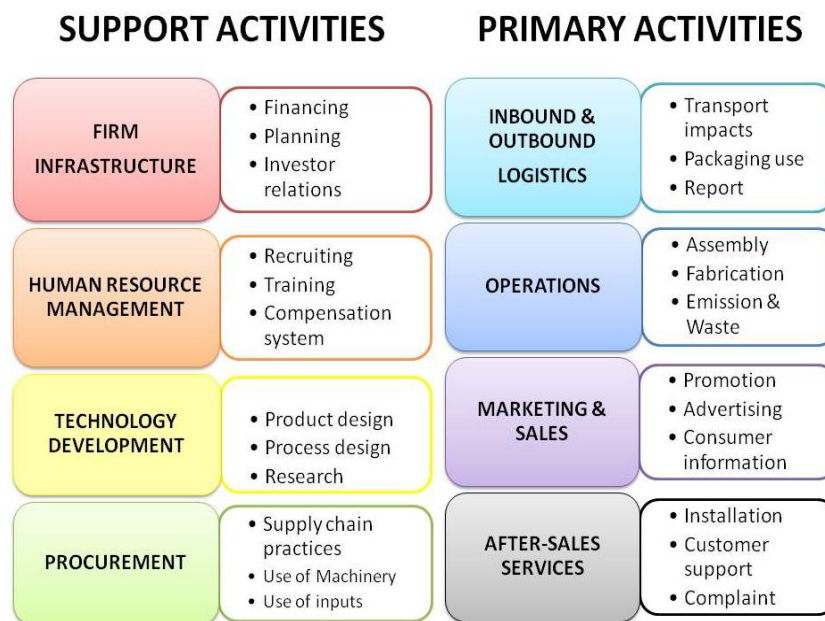
However, none of these defensive’s action could be helpful enough to “*identify, prioritize, and address the social issues that matter most for a company*” and thus “*seizing the opportunities coming from this relation*” (Porter and Kramer, 2006).

The consequence of this fragmentation and lack of integrated vision was a tremendous lost opportunity and a confused framework of study. In order to address this issue and overcome the theoretical obstacles, the authors suggested to focus on the interrelationship between corporation and society, because “*Successful corporations need a healthy society and at the same time, a healthy society needs successful companies*” (Porter and Kramer, 2006). This interdependence described by the authors may have two forms, called *inside-out linkages* and *outside-in linkages*.

The first involves the identification of whole company’s social impacts on the society (both positive and negative) through the analysis of all the activities a company engages in while doing business. By creating an inventory of problems and opportunities linked to the value-chain, such impacts must be investigated, prioritized and addressed, as represented in figure 4.

In this sense, a company, rather than merely acting on well-intentioned impulses or reacting to outside pressure, can set an affirmative CSR agenda which produces maximum social benefits as well as gains for business.

Figure 4. Inside-out linkages representation

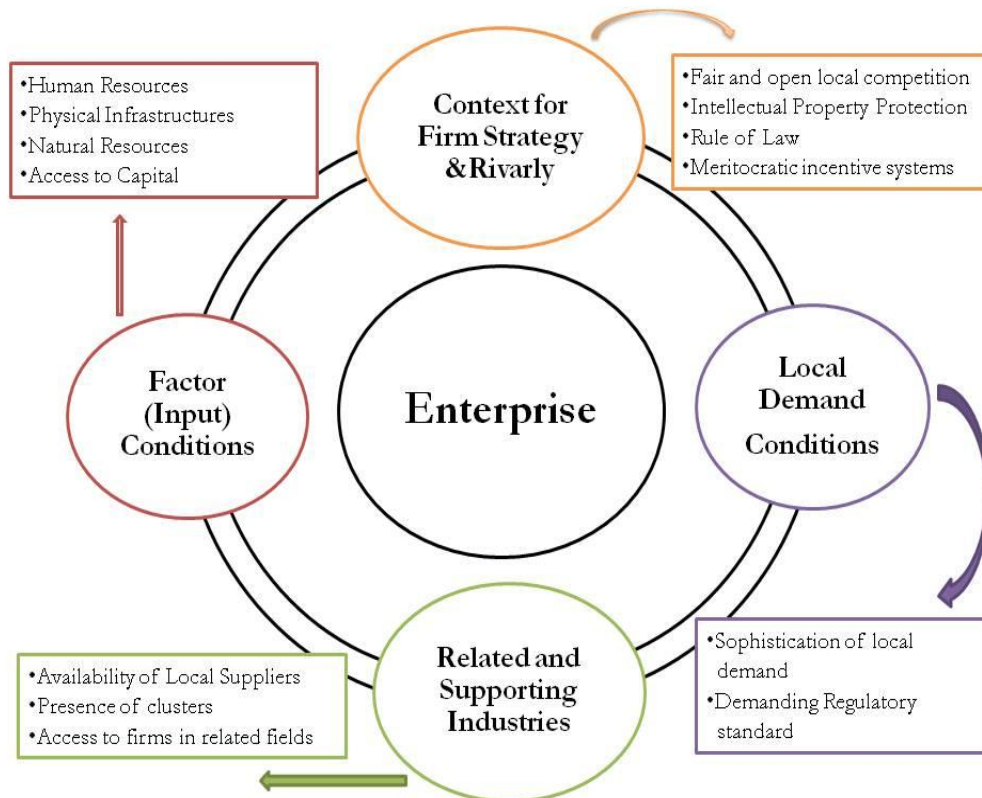


Source: re-elaboration of the author, from Porter and Kramer (2006)

The second form of interaction, instead, looks at the external factors which could influence the firm’s activities, such as the quantity and quality of available business inputs, the rules and incentives that govern the competition, the size of local demand and the local availability of supporting industries. These relations can be understood through a diamond framework, which has the peculiarity to show how the conditions of company’s location affect its ability to compete, as showed in figure 5. In a competitive context, companies cannot obviously take on every area in the diamond.

Therefore, each company, according to the authors, must select those issues that intersect with its particular business and which have the greatest strategic value in terms of potential impact.

Figure 5. Outside-in linkages representation through a diamond framework



Source: re-elaboration of the author, from Porter and Kramer (2006)

The contribution of Porter and Kramer was important because it introduced another important conceptual distinction, between a so-called *Responsive CSR* and a *Strategic CSR*. The first kind of CSR refers to the behavior of a company which simply acts as “good corporate citizen” and principally mitigates the existing or anticipates adverse effects from business activities. On the other hand, the second considers CSR as a strategic asset of firm’s behavior, which involves both inside-out and outside-in dimensions, working in tandem and when CSR is hard to distinguish from day-to-day business of the company (Porter and Kramer, 2006). The authors therefore underline the importance of this second dimension of CSR, because able to “unlock shared value by investing in social aspects of context that can strengthen company competitiveness” (Porter and Kramer, 2006).

After this first article, the two academics came back on this topic in 2011, when they published another fundamental article appeared on the Harvard Business Review and titled “Creating Shared Value”. This work, starting from the previous one dated 2006, better defined the concept of Shared Value. According to the authors, Shared Value should be considered as a guideline principle which should be adopted by all companies while making business. Based on the idea of a strictly interconnection between a firm and the surrounding environment, SV involves the *“creation of economic value in a way that also creates value for society by addressing its needs and challenges”* (Porter and Kramer, 2011). In this sense, the purpose of a corporation must be redefined, not only in terms of profits, but with the recognition of societal needs and societal harms connected to the firm’s activity. The idea proposed is that *“Companies can create economic value by creating societal value”* and considers the fact that both economic and social/environmental progress must be addressed to using value principles. This concept, has been defined as *revolutionary*, because able to reset the boundaries of capitalism and the role of business firm inside the market’s arena, opening new ways to serve new needs and expanding markets.

Conceived, in fact, as *“a more sophisticated form of capitalism”*, SV is able to reconnect company success and community success, *“unlocking the future wave of business innovation and growth”*.

Therefore, in order to create Shared Value a company should:

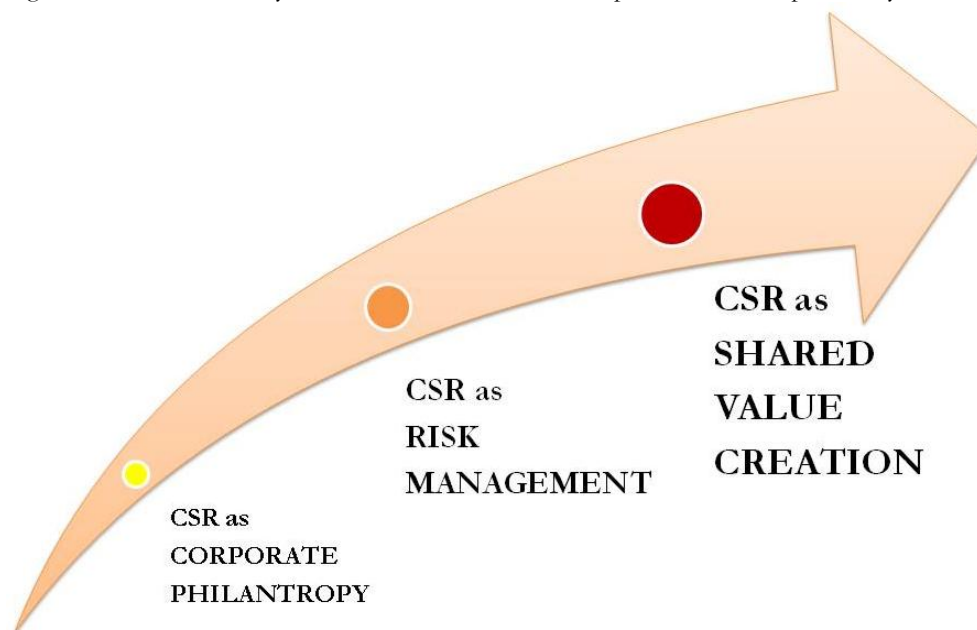
1. Re-conceive products and markets, before having identified all the societal needs, the benefits and the harms that could be embodied in the firm’s products.
2. Enable Local-Cluster development, which could play a crucial role in driving productivity, competitiveness and innovation
3. Redefine Productivity in the Value Chain, especially in the field of: energy use and logistics (transportation, buildings); resource use; procurement & distribution; employee productivity (worker’s safety, wellness, training).

In the Shared Value paradigm, the “new” CSR is considered neither as corporate philanthropy – with little strategic and operational impact and short-term benefits– nor as a merely tool for risk management.

Conversely, SV envisions CSR as an important instrument with fundamental and strategic impact, capable of becoming part of a company's competitive advantage. Therefore, the new point of view brought by this vision is that, nowadays, businesses can create profits precisely starting from the resolution of those societal issues, which in the past century were considered as additional expenditures in the balance sheet. There would be no longer a trade-off between economic efficiency and social progress but, on the contrary, an intense synergy would exist, especially on a long-term perspective. In this way, reducing pollution and gas emissions, for example, can allow firms to save money while reducing their costs, as well as a safer working environment can contribute to avoid more incidents and thus the expenditures.

If McWilliams and Siegel (2006) affirmed that CSR lacked a dominant paradigm, years later it seems that the one formulated by Porter and Kramer could be the right one to play this role. *“Doing well by doing good”* has in fact become a fashionable mantra and businesses have eagerly adopted the jargon of *“embedding CSR”* in the core of their operations, making it *“part of the corporate DNA”*, able to influence decisions across the company (Porter and Kramer 2011).

Figure 6. The evolutionary transition of the debate on Corporate Social Responsibility

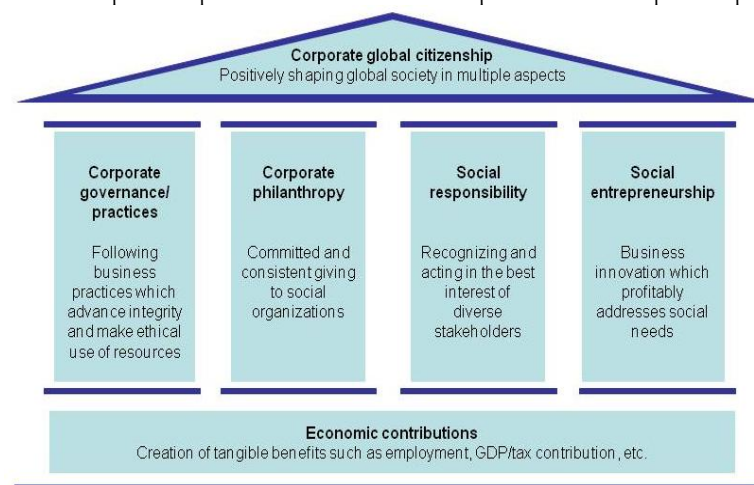


Source: elaboration from the author

1.6. GLOBAL CORPORATE CITIZENSHIP

Since the beginning of the new century, also the idea of a *Global Corporate Citizenship* has also appeared on the stage of CSR debate. Even if it is not a new concept (Carroll, in 1998, had already introduced the idea that an enterprise should act as a *good corporate citizen*) this perspective was institutionalized by the work of Schwab in 2008, written for the World Economic Forum (Fiorani et al., 2012). The broadening of communities and the progressive affirmation of global responsibilities within the global markets, have mainly led to the affirmation of this model of global citizenship. According to this point of view, an enterprise can be considered as a citizen, holding duties and rights, which acts as fundamental actor for the improvement of global practices, in support of the existing institutions. This new approach absorbs CSR within its boundaries, and according to it, a company should no longer be considered *socially responsible* only because it satisfies the countless requests coming from stakeholders, but also because it has to bear additional responsibilities towards the whole surrounding civil society. An enterprise which operates in accordance with this approach must, therefore, commit itself both in different CSR activities – such as multiple stakeholder management or the adoption of new accountability systems and sustainability reporting – but it should meanwhile implement a wide range of actions in order to allow the achievement of a greater wealth of the society. These different actions, requested by this vision, cover a broad range of tasks and must be accomplished in an integrated perspective, as represented in the underlying figure 7.

Figure 7. Graphical representation of Global Corporate Citizenship concept



Source: Schwab (2008), from Fiorani et al. (2012)

An enterprise which acts as a “global corporate citizen” must therefore implement activities of *corporate philanthropy*, make available its own human resources and its *know-how* to different community projects (*community volunteering*), develop rationales of social entrepreneurships with *start-up* companies and commit itself to issues of *Corporate governance*. While the domains of corporate governance and CSR appear well consolidated from the practical and theoretical point of view, the situation is different if it refers to the fields of social entrepreneurship and corporate philanthropy, which are more dynamic mechanisms and show interesting perspectives of improvement (Fiorani et al., 2012).

The first, the one of social entrepreneurship, could assume different forms, from the creation of an internal social business unit by the enterprise itself to the establishment of a *grant foundation* directly engaged in financing projects or encouraging the naissance of social enterprises. The distinctive character of the social entrepreneurship is therefore the pro-active intentionality through which the enterprise pursues an economic return while looking for environmental and social benefits. It is in this sense, the ethical finance, the socially responsible investing, the social impact bonds or the microcredit’s projects represent some of the instruments which can be used in order to achieve this objective.

The second area of corporate philanthropy is also very dynamic. The traditional philanthropy, based mainly on donations, is here substituted by new forms of involvement, such as the participation in *social venture capitals* or in new public-private partnerships at global level (*venture philanthropy*), such as the *Global Fund* promoted by the Gates Foundation (Fiorani et al., 2012).

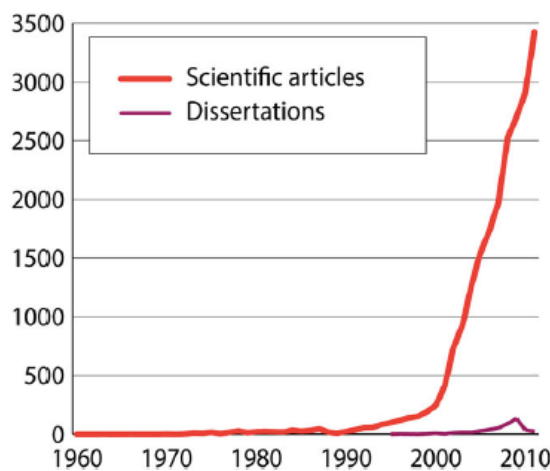
1.7. FINAL CONSIDERATIONS

As showed in the previous sections, CSR debate has been characterized by a non-linear evolution and by an heterogeneity of approaches regarding the relationships between business and society. Across time, each one of the themes concerning the role and responsibilities of business in society has had its climax, with a convergence of academic interests and research, but nowadays it is still difficult to clearly understand what CSR means.

Until the '90s, as demonstrated, uncoordinated theories and paradigms were provided and most of them considered CSR activities more as philanthropic actions implemented by those “good corporate citizens” who wanted principally to enhance their reputation toward the public opinion. In this sense, practices of *green washing* or *social washing* started to spread with the belief that these could be sufficient to satisfy the public opinion and reassure the customers. In the 70's and 80's, corporate responsibility programs were considered more a defensive reaction of firms to an external pressure, and not as strategic assets of a company's vision.

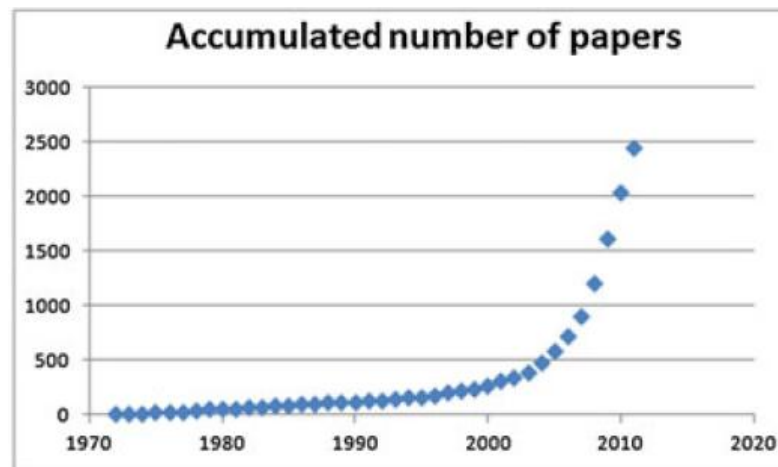
In this context, the most important purpose of the company was still the one connected to expand the profits and the revenues for the shareholders and Friedman's vision was the dominant one within the CSR theoretical discourse. Certainly, as previously demonstrated, there were some exceptions, such as the works of Carroll and Freeman, who tried to oppose to the mainstream neoclassical approach: their contribution to the discussion about CSR was fundamental and their studies contributed to increase the knowledge and the understanding of the phenomenon. However, it was primarily in the '90s that a more concrete discussion on CSR started to spread, as also indicated by figures 8 and 9, extrapolated by the research papers of Danilovic et al., (2015) and of Lu and Liu (2014). The two graphs represent, respectively, the global number of publications on CSR from 1963 to 2011 and the accumulated number of papers on the topic from 1970 to 2010. It's possible to notice how, since the early 90's, the global publications dealing with CSR have increased, with an acceleration occurred from the beginning of the new century.

Figure 8. Global publications on CSR from 1963 to 2011



Source: Danilovic et al. (2015)

Figure 9. Growth curve of the accumulated number of CSR papers



Source: Lu and Liu (2014)

Indeed, during the decade of '90s, the empirical researches on CSR increased, with the result that “ten times as many CSR articles were published over the past decade versus the sum total of all CSR articles beforehand” (Lu and Liu, 2014). Moreover, those years were characterized by a continuous extension of CSR concept through inclusion of new categories to the area of business responsibility, and this led to the emergence of alternative definitions of the topic, spreading through business circles (e.g. RBV's approach).

Therefore, scholars dedicated more attention to the study of CSR, in particular to the analysis of the relation between CSR and Financial Performance, providing the first empirical outcomes, even if with uncertain and uncompleted results (Margolis and Walsh, 2003). Meanwhile, more and more practices of CSR started to be progressively accepted worldwide and many companies started to convert themselves to the *responsible paradigm*. However there was still a lack of an accepted common CSR framework and thus, CSR activities were implemented in a fragmented and uncoordinated way within the firms themselves. In this context many theoretical issues still claimed a resolution.

The answer to this important absence was the framework proposed in 2006 by Porter and Kramer. Since then, the Shared Value has emerged as a mainstream paradigm, able to justify responsible actions of firms and has unified them under a new theoretical umbrella.

In this respect, company after company has been shaken into adopting a CSR policy with the main purpose of *Creating Shared Value*, thus reinforcing the links between firm and the surrounding community. The empirical studies, while confirming the existence of a positive connection between responsible behaviors and economic returns, also facilitated the diffusion of CSR's thinking.

Therefore, in recent years, CSR has progressively gone deeper within the business strategy and it has been "embedded" in the business, starting for some realities to influence decision-makers on everything, from sourcing to strategy.

In addition to the trend to adhere to CSR paradigm, more and more companies have paid growing attention to the importance of demonstrating their CSR commitment through clear and verifiable data and information, similar to the traditional financial documents. Social, environmental and sustainability reports have started to spread since the end of '90s and, nowadays, they represent the main instruments used to formalize firm's position on CSR while providing viable opportunities to assert commitment to good business practices. These practices, collecting information about critical social and environmental issues, not only represent a step towards evaluating and measuring the overall corporate responsibility performance, but also, a concrete opportunity to identify strengths and weaknesses across the whole spectrum of corporate responsibility.

The combination of a strong commitment to CSR and strong commercial competence has started to be viewed, therefore, as a good chance to the success of the company and more and more companies around the world have started to apply tighter codes of practices across global supply chains, activating cross functional management functions expressly dedicated to corporate responsibility and disclosing environmental and social information through the mean of reports. In addition, the institutionalization of the subject has drastically increased and a lot of international agencies have published their guidelines in order to standardize the CSR practices across the world, helping the exchange of *best practices* and, in general, reorganizing the world of business in the 21th century. A notable number of international standard, relating to different areas of corporate responsibility (e.g. ISO 14001 and SA8000), have been published and many businesses across the globe started to embed the sustainability mantra into their day-to-day business operations, while creating long-term shared value for their stakeholders.

Therefore, CSR nowadays can be considered a business imperative and all the governments are becoming much more active in promoting it by enacting legislations which pave the way for sustainable and responsible practices.

In the meantime, the global debate on CSR is continuing, and international institutions are promoting it through different initiatives and formal definitions, offering approaches, management tools and supporting the diffusion of best practices.

In this regard, the second chapter of the work will focus on these distinctive features of CSR, analyzing the main instruments diffused and recognized at international level, the tangible outcomes resulting from its implementation and the international experiences which are boosting the creation of responsible business.

In the following table, is represented a reconstruction of the evolutionary path of CSR, as outlined in the present chapter, indicating the name of the author, the year of publication of his work, and the key arguments achieved or analysed.

Table 1. The evolutionary theoretical path of CSR

Author(s)	Year	Key argument/result
* Howard Bowen	1953	CSR considered as a complementary and corrective measure to be implemented by business for some social failures
* Keith Davis * William Frederick * Joseph McGuire	1960 1960 1963	They supported the idea of a connection between business and ethics and the fact that corporations have some duties towards the society in which they operate
* Milton Friedman	1962	<i>Agency Theory</i> → CSR is indicative of self-serving behavior on behalf of managers. In this sense firms do not have any ethical obligation despite the ones towards the shareholders and the first responsibility is to maximize profits and the shareholder wealth.
* Wallich & McGowan	1970	CSR's activities are consistent with stockholders long term interest
* Committee for Social Development	1971	Business must assume broader responsibilities to society. Its future depends on the quality of management's response to the changing expectations of the public.
* Archie B. Carroll	1979 1983 1998 2003	Proposition of an integrated framework of total social responsibility called "four-part CSR model", where CSR is composed by 4 discretionary categories. The economic and social goals of corporations are not considered as incompatible trade-offs
* Edward Freeman	1984	<i>Stakeholder Theory</i> → Company has wider responsibilities which even touch the welfare of the stakeholders interested in the company's activities, such as workers, customers, suppliers and community organizations

* Max Clarkson	1995	The survival and the success of a company relies on the abilities of managers to create enough richness and satisfaction for all the different stakeholders, both primary and secondary
* M.T. Jones	1995	Firms involved in repeated transactions with stakeholders on the basis of trust and cooperation have an incentive to be honest and ethical, because this behavior is beneficial to the firm
* Jay Barney	1991	<i>Resource-based view of the firm</i> → The competitive advantage of a firm would principally rely on some firm-specific assets, if these are valuable, rare, inimitable and non-substitutable
* Stuart L. Hart	1995	He applies RBV framework to CSR. For certain types of firms, environmental responsibility could constitute a resource that would lead to the achievement of a sustainable competitive advantage
* Russo & Fouts * Reinhardt	1997 1998	Empirical studies attempting to prove and explain the tight association between CSR and the financial performance of corporations
* John Elkington	1997	Triple Bottom Line approach: environment+ society + economy
* McWilliams & Siegel	2000 2001 2006	Supply/demand perspective on CSR. The firm's ideal level of CSR can be determined by cost-benefit analysis
* Michael Porter & Mark Kramer	2006 2011	<i>Creating Shared Value</i> → CSR considered a source of tremendous social progress. There is a mutual dependence between society and business and this involves the "creation of economic value in a way that also creates value for society by addressing its needs and challenges"
* Klaus Schwab	2008	<i>Global Corporate Citizenship</i>

CHAPTER II

Inside CSR: the drivers, the practical instruments and the multi-dimensionality

2.1. CSR: A POLYHEDRIC CONCEPT

As expressed in the first chapter, a trustful interchange between the enterprises – guided by CSR principles in its mission – and the surrounding social and natural environment, appears to be an essential element both for their long-term economic growth and the overall well-being of society, especially in the light of the unprecedented structural crisis in which the capitalist system has fallen. In this context, responsible corporations are more and more seen as the necessary agents of any potentially positive change, acting in the public interest (Toms, 2014).

The pressures caused by the potential damages of global warming and the long-term objectives deemed necessary for the achievement of a *zero-carbon economy*, could act, indeed, as engines for a radical rethinking of corporate behaviors. In this respect, the actualization of corporate responsible practices could be the right chance for companies to rethink their behaviors in an ethical way, thus restoring the trust of citizens and of public opinion versus business (Scherer and Palazzo, 2009). However, the behavioral changes required to corporations should not be considered as possibilities, but more as an imperative to be achieved; the *post peak oil world*⁶ will only be the stage of those enterprises which will have abandoned the narrow view model of capitalism characterized by the dominance of short-term thinking and personal interests in order to achieve a more general wellness.

⁶ *Post peak oil world* refers to a future scenario in which the world will have overcome its peak oil, thus its peak production rate, as suggested by M. Hubbert in 1956

As outlined in Chapter I, enterprises are more and more considered as “*good global corporate citizens aimed to create shared value for the society in which they operate*” (Porter and Kramer, 2011) and this means, in practice, that they have to go beyond the requirements imposed by law, establishing voluntary correct relationships with the numerous external and internal stakeholders, respecting the natural environment with some actions and providing good and fairly services to the community. Therefore, the ability to effectively manage these increasingly pressing requests has become crucial for their long-term economic sustainability in the globalization era (Perrini et al., 2006). Corporate Social Responsibility, in this respect, has thus emerged as the most powerful paradigm able to achieve this wide goal.

CSR, as showed, can be considered as a “*different and ethical way of doing business*” (Perrini, 2002), no longer conceived as a merely philanthropic phenomenon, but more as a structural dimension of the firm’s strategy, assimilated by all levels of company’s structure. In this sense, responsible actions should not be interpreted as additional constraints or costs, but considered as key factors able to reinforce the competitiveness of the firm, to accrue its competitive advantage respect to competitors, while establishing lasting and profitable relations with the stakeholder community, according to a *win-win* perspective (Sacconi, 2005). In this sense, CSR could not only lead to more robust company’s performances, but it could also contribute to pursuit the strategic priorities set up by governments and international organizations by indicating, for example, innovative directions for a renewal of traditional welfare state mechanisms or by spurring the development of new sustainable technologies or environmental innovations, through a deeper and more active participation of companies in the phases of research, implementation and then diffusion (Rexhepi et al., 2013).

The notion of CSR, as showed before, means “*different things to different people*” (Le Bas and Poussing, 2013) and no single, coordinated and commonly accepted definition of the concept does exist. Indeed, CSR is a multidimensional concept which is “elusive, malleable and blurry” and because there are different perceptions of what it constitutes, more than 40 definitions have been developed in the literature, as pointed out by the research study of Dahlsrud (2008).

Business for Social Responsibility (BSR) for example – a global non-profit organization that helps member companies to “achieve commercial success in ways that respect ethical values, people and the environment” – defines CSR as:

*“a comprehensive set of policies, practices and programs that are integrated throughout business operations and decision-making processes in a manner that meets or exceeds the ethical, legal, commercial and public expectations that society has of business”*⁷.

The World Business Council for Sustainable Development – a CEO-led, global advocacy organization of some 200 “forward-thinking” international companies created in 1995 – stresses, instead, that:

*“CSR is the continuing commitment by business to ethical behaviors which contributes to economic development while improving the quality of life of the workforce and their families, as well as of the local community and society at large”*⁸.

The Business Dictionary – one of the leading online business resources – defines the concept as:

*“a sense of responsibility by a company with respect to the community and the environment – intended both as ecological and social – in which it operates”*⁹.

However, one of the most diffused and reported definition of CSR is the one promoted by the European Union and included inside the *Green Book* of 2001, in which CSR was specified as:

*“a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis. CSR is a business contribution to sustainable development, a management approach which enhances competitiveness, social cohesion and environmental protection”*¹⁰.

This first definition was subsequently amended by the Communication on 25th of October 2011 inside which the European Commission simply identified CSR as *“the firm’s responsibility for its impact on the society”*.

⁷ See www.bsr.org

⁸ This definition was developed in 1998 for the first WBCSD-CSR dialogue in Netherlands.

⁹ <http://www.businessdictionary.com/definition/corporate-social-responsibility.html>

¹⁰ See the EU Green Paper (18/07/2001)

Over the last fifteen years, the explosion of interest in the subject of CSR on the part of businesses and governments has been notable on several dimensions, which included: the global and multinational enterprises which had issued codes of conduct on various aspects of their social and environmental policies and disclosed a growing number of sustainability reports; a steady increase in the number of social/ethical brands, eco-friendly labels or certification schemes promoted by several organizations; numerous initiatives launched by national governments and international institutions in order to encourage the adoption of responsible behaviors (Vogel, 2005). In fact, over 300 CSR codes, principles, performance standards or management schemes developed by governments, business associations or academia, not mentioning the huge number of individual companies' codes of conduct or reporting initiatives, have aimed at demonstrating a deeper CSR commitment so far (Mazurkiewicz, 2004).

Undoubtedly, the scale of such measures differs across firms and across countries, but all these initiatives can be considered the distinctive features of a comprehensive success of the CSR paradigm, whose booming is by now recognized as an unavoidable reality. As stated, in fact, in the Special Report on CSR draft by The Economist, "*Today, Corporate Social Responsibility, which is the tribute that capitalism pays to virtue, has marked a significant victory in the battle of ideas*"¹¹.

In order to fulfill the final objectives of the present study, it is therefore important to deeper analyze the polyhedral nature of CSR and the following chapter is meant to deal with this issue. First, a description of the main drivers, which have incentivized the rise of CSR, is provided. After that, the multidimensional nature of CSR will be discussed, starting from a basic distinction between an internal and an external dimension of corporate responsibility. The subsequent section will examine the main instruments of CSR used by companies, and then followed by a classification of the different degrees of CSR engagement. The last section, instead, will deal with the strategic implications of CSR, with a focus on the empirical studies which have tried to demonstrate the existence of a positive relationship between CSR and the financial performances of businesses.

¹¹ <http://www.economist.com/node/10491069>

2.2. THE ENGINES AND DRIVERS OF CSR

Before starting with a detailed analysis inside CSR multidimensionality, it is useful to reorganize the information about the forces and drivers which have mainly spurred the diffusion and the success of CSR concept. The “*engines of CSR*” thus can be classified into seven classes:

- a) The global macro-phenomena
- b) Tangible corporate benefits
- c) Regulation and compliance
- d) Standard and certifications
- e) Transformation of consumer’s behaviors
- f) Socially Responsible Investing (SRI)
- g) Civil society and NGOs

2.2.1. THE GLOBAL MACRO-PHENOMENA

Since the second half of the ‘90s, different phenomena in the international economic and social arena have fostered the rise of responsible practices: within them, the most important factor of change has been undoubtedly the globalization process. Globalization, while allowing firms to acting globally and managing an enormous pool of resources, has called for a fresh view concerning the role and responsibilities of business in society, both at local and at global level (Perrini et al., 2006). Globalization, indeed, has raised new imperatives for business legitimacy across borders, because it produced a sort of gap in global governance, especially in some cross-boundary activities (Moon, 2007). Therefore, a growing number of corporations has started to assume those social and political responsibilities, that once were considered the mandate of the State only, adopting a broader approach consistent with the features of new governance, acting as *global corporate citizens*, developing corporate codes to embed CSR across their supply chain, and getting more and more involved in unconventional domains such as human rights protection or social and environmental management (Scherer and Palazzo, 2006).

A second relevant element has been the diffusion of a more comprehensive ecological culture at global level and the emergence of the *Green Economy* paradigm. The awareness of the problem of greenhouse effect and the consequent global warming issue, the environmental disasters connected to the oil and nuclear energy sectors – such as the Bhopal incident in 1984, the Exxon Valdez oil spill in 1984 or the Chernobyl catastrophe in 1986 – and some milestone environmental events (above all, the diffusion of the concept of *Sustainable Development*¹² or the Earth Summit held in 1992 in Rio de Janeiro), have all incentivized the world of business to reconsider its environmental attitude and implement a new *Corporate Environmental Responsibility*. Therefore, a growing number of enterprises started to reconsider the natural environment not as a passive receptor of wastes and pollution, but more as a powerful engine of change and technological innovation, as well as a strong element of competitiveness (Azzone et al., 1996). In this respect, a considerable number of initiatives in the environmental domain, has started to be diffused and implemented all around the world.

Within the macro-drivers which have encouraged the diffusion of CSR, a prominent role should be also attributed to the growing awareness for human and workers rights' protection, issued by the actions of international organizations such as UN and ILO, which have favored a radical transformation of business' behaviors and their widespread diffusion.

Finally, crucial in this global dissemination process, it's also important to remind: the rapid process of integration of financial markets; the technological advancement achieved in several domains; the evolution of market sectors and industries; the competitive pressure, which has stimulated business creativity in the research of innovative solutions in solving new social and environmental problems (Ditlev-Simonsen and Midttun, 2011).

¹² The term of "Sustainable Development" was coined in the paper of 1987 "*Our Common Future*" released by the Brundtland Commission: "*Sustainable Development is the development that meets the need of the present without compromising the ability of future generations to meet their own needs*".

2.2.2. CORPORATE BENEFITS

Among the engines which have fostered the propagation of CSR in the global arena, it is also crucial to mention the growing trend regarding a significant and positive relationship between the corporate social/environmental performance of firms and their financial results¹³. As empirically suggested, CSR should not be considered as an expense, but rather as an element that, if correctly integrated into the company's governance, would be able to improve its financial performance and competitiveness on the long run, while reducing the "risk profile" (Sacconi, 2005). Therefore, since it became clear that the implementation of a correct CSR strategy could offer sizable benefits, an increasing number of companies started to integrate responsible practices within their business boundaries.

These benefits can be summarized as follows:

- *An enhanced reputation, brand loyalty and trust*

The need of more fairness and transparency, arising from some popular scandals – such as the one of Nike, accused in the early '90s of allowing some abusive labor practices – and business failures, emerged as an important driver for the diffusion of more responsible business behaviors (Porter and Kramer, 2006).

The enterprises, while becoming more and more exposed to the public scrutiny over a notable number of topics and being frequently judged on the basis of their environmental and social stewardship, needed to improve their external image and enhance their reputation. In this sense, CSR adoption appeared to be the right chance to achieve these objectives and a lot of companies started to adopt voluntary codes in order to demonstrate their *eco-friendly* attitude or non-discriminating behaviors. Keeping in mind the "*By doing good*" motto, managers started to consider CSR no longer a luxury but a requirement, leading to gain in reputation which would have improved their company's ability to attract resources, enhance performance and build sustainable competitive advantages (Ditlev-Simonsen and Midttun, 2011).

¹³ The empirical evidence of this relationship will be further analyzed in the last section of this chapter

- *An increased capacity of attracting, motivating and retaining talent*

Among the benefits arising from CSR, there is also the possibility for a firm to improve its external appeal and to increase its ability of attracting new skilled and performing talents. Job seekers are more and more interested in the organizational values and in the approaches that businesses take to corporate citizenship and corporate responsibility (Perrini et al., 2006). For a talented person, what attracts him is not only a good salary, but also a good corporate social image. Therefore, those firms which take CSR actively and strategically are easier to obtain and keep excellent staff, so that they could fulfill long-term and healthy development, because CSR practices are able to foster a better, safer and more motivating working environment (Sacconi, 2005).

- *A better risks' management and mitigation*

Good management strategies offer firms a useful framework in which assessing and managing an increasing number of risks. Companies can rely on CSR in order to manage and ideally reduce risks at different business levels. Therefore, investments in CSR activities have a direct impact on lenders' and potential investors' perception of company risk, because these categories could perceive a firm engaged in CSR as less risky than the others, thus increasing the firm's access to market capital.

- *Operational improvements and efficiency gains*

Among the benefits deriving from CSR activities, it is also possible to mention those improvements resulting from a better reorganization of operational phases and the gains in efficiency. If CSR would be correctly implemented, it could add a great value to operational efficiency, especially in terms of energy savings, use of natural resources, production of hazardous wastes and a lower environmental impact. All these efficiency gains could be reflected in sizable savings in productions costs, input costs, labor costs (through reduced absenteeism) and reduced costs of compliance with external regulations. All these money could then be re-invested for adopting new technologies or to increase R&D expenditures. This benefit could be particularly relevant, especially for Small and Medium Enterprises, which have to search the best methods to optimize the use of resources and thus increase their overall efficiency.

- *Development of new business opportunities*

By focusing on CSR, corporations can establish their own brand in a long-term perspective. In fact, only providing society with high-quality products and showing a good corporate image to external stakeholders, corporations can gain returns and approval from society and customers. Therefore, investments in CSR are able to incentivize product differentiation, allowing firms to produce goods and services with attributes or characteristics that signal the specific commitment of the firm itself to the consumers, opening the doors of new markets (Mazurkiewicz, 2004). An example in this respect, could be the organic, pesticide-free foods produced by a big food industry, which can be purchased by a specific segment of consumers, because they incorporate some socially responsible attributes, such as the sustainable method of production (McWilliams and Siegel, 2001).

- *A stable and prosperous operating environments*

The commitment of businesses in CSR is crucial for realizing greater cooperation with the societal community of interest and building that political capital useful when community decisions may affect the enterprise itself (Perrini, 2002).

2.2.3. REGULATION AND COMPLIANCE

The transformation of the regulatory framework well represents another component which has spurred the diffusion of CSR. The advancement in the field of regulation has firstly led to the application of more stringent requirements on corporations, especially in relation to their social and environmental impacts. As a consequence, there has been a progressive enlargement of the overall business performances to be monitored and to be accounted in the balance sheet, with the inclusion of the environmental and social dimensions (Scherer and Palazzo, 2006). Secondly, the orientation of these regulations has been to encourage the enterprises in engaging in a multi-stakeholder dialogue with non-state actors such as corporations and NGOs, in order to promote a new global governance and create a cooperative and collaborative climate in the international arena, *“able to face and correct those new global challenges which cannot be anymore regulated or compensated unilaterally by national governance”* (Scherer and Palazzo, 2009).

To this renewed compliance framework belong some of the norms released by different supranational institutions, such as the United Nations (with the “Global Compact principles” or the “UN Guiding Principles on Business and Human Rights”), the European Union (with the renewed “European Strategy on CSR” launched in 2011 or the Directive 95/2014/EU regarding the disclosure by enterprises of non-financial information), the International Labor Organization (with the “Tripartite declaration of principles concerning multinational enterprises) or the OECD and its “Guidelines for multinational enterprises”.

Besides, the legislative activism of national governments was another important driver. It is clearly evident that, when a certain legislative framework exists, companies, which are required to comply with it, tend to perform better, also in terms of social responsibility. Nevertheless, the way in which the framework is conceived and implemented determines whether it can be beneficial or detrimental for society. According to Porter and Kramer (2011), a regulation that wishes to enhance the path of corporate responsibility must firstly “*set clear and measurable goals, stimulate innovation, put in place universal measurement and performance-reporting systems and highlight a common societal objective*”. In this sense, many governments have shown a great interest in encouraging the adoption of CSR initiatives, conceiving them as complementary to their ongoing environmental and social programs (Mazurkiewicz, 2004). In the UK, for example, the public sector only played the role of a promoter of change and facilitator of dialogue, minimizing public intervention. In France, instead, the central government took a more regulatory approach, while the Nordic nations fostered a partnership-oriented strategy (Perrini et al., 2006). Some have created specific Minister for CSR such as the UK, while other have introduced *soft* regulation mechanisms to encourage more responsibility, for example stimulating the private sector by providing funding for research, by using economic incentives or by leading campaigns in order to give to the business community a clear indication to the wished direction of society’s development (Dummett, 2006).

2.2.4. STANDARD AND CERTIFICATIONS

In parallel to the normative evolution, an increasingly set of certifications, guidelines and management standards, related to CSR, has spread at the international and national level, with the goal to evaluate and report the economic, social, environmental and sustainability performance of companies. All these instruments, although not required by law and therefore not binding, have become reference frameworks for corporations because able to guarantee a higher degree of commitment in some responsible behaviors and constituting an instrument of prevention from an excessive regulation set by the government. These standards provide qualitative and quantitative information, and cover different subjects, thus implying different duties and responsibilities. Within them, it is possible to mention: the ISO 9000 family of quality management standards; the ISO 14000 family of environmental management standards; the Eco-Management and Audit Scheme (EMAS); the OHSAS 18000, an internationally standard for occupational health and safety; the SA8000 certification, based on the principles of international human rights norms, as described in the ILO conventions and in the Universal Declaration of Human Rights; and lastly, the ISO 26000, an international standard providing guidelines for social responsibility.

2.2.5. TRANSFORMATION OF CONSUMERS' BEHAVIORS

Among the elements which have contributed to the growth CSR, it is also important to mention the pressures coming from consumption transformations. In recent years, an increasing segment of consumer's demand has started to value the presence of some CSR attributes embodied in a specific product, or to take into account the firm's commitment to some CSR initiatives in the evaluation of companies and their products (Sacconi, 2005). Therefore, a growing number of consumers have started to direct their purchase intentions considering the presence of different responsible features in a company's specific product.

So, there are customers who choose a firm rather than another, as it treats its customers in a fair way – asking them to pay a reasonable price – or because it's more focused on human rights and dignity respect.

Somehow the demand of CSR can be motivated by the degree of firm's environmental commitment or by the type of relationship which the enterprise has with the society and the local community of interest. That's why a growing number of companies have begun to incorporate CSR into their marketing strategies, by discovering new opportunities for differentiation of production, repositioning themselves in traditional markets or recognizing the potential of new markets previously unexplored (MacGregor and Fontrodona, 2008).

2.2.6. SOCIALLY RESPONSIBLE INVESTING

A further component of the macro-engine of CSR, is represented by the phenomenon of Socially Responsible Investing (SRI), also known as sustainable, "green" or ethically investing, which could be defined as "*any investment which seeks to consider both financial return and social good*" (Molteni, 2004).

SRI represents a new opportunity for those companies adhering to the "CSR way of life" and it mainly consists of managing financial assets according to ethical, social and environmental criteria. SRI includes green investment funds, social and ethical investment funds, pension funds, open-ended investment companies, ethical private banking or closed funds (Perrini et al., 2006). In general, socially responsible investors encourage those corporate practices that promote environmental, human rights and consumers protection while avoiding those businesses involved in alcohol, tobacco, gambling, pornography or weapons production. SRI boomed in the nineteen eighties/nineties when a greater demand for SRI emerged. The growing interest of investors in the social and environmental dimensions of portfolio choices has been connected with the growth in ethical stock indexes, more and more used as benchmarks for financial products and to select companies which meet ethical financing requirements. Considering these rating systems, it's important to remind: the *Domini 400 Social Index* (launched in 1990); the *Standard & Poors 500*; the *Dow Jones Sustainability Index* or the *Standard Ethics Rating* emanated by the Standard Ethics Agency (Porter and Kramer, 2011).

2.2.7. CIVIL SOCIETY AND NGOs

Another relevant factor has been the role played by the subjects and organizations of civil society, such as NGOs¹⁴, environmentalist groups, consumers associations and trade-unions. In particular, NGOs have given an important contribution in shaping CSR norms and forcing many companies to change their attitude (Skouloudis et al., 2015).

Traditionally depicted by business as adversaries or “*community watchdogs*”, over the recent years these groups have more and more turned to be pivotal actors of powerful institutions, fostering social awareness and solidarity or shaping business attitudes and actions. Nowadays, these organization are recognized as essential players of the institutional context for embedding CSR in the for-profit culture (Scherer and Palazzo, 2009).

NGOs can be considered, in fact, as those key institutional players which are driving corporations to become more environmentally and socially responsible at the national, transnational and international level. Over the years, NGOs have strongly promoted the adoption of different self-regulatory ethical codes and initiatives, while serving, in the meantime, as consulting bodies’ advisors for screening the criteria employed to describe SRI’s funds for example, highly valuing the contribution of for-profit entities in human rights protection, occupational health and safety as well as environmental management (Skouloudis et al., 2015).

¹⁴ According to the definition of UN “An Non-Governmental Organization is any non-profit, voluntary citizens' group which performs a variety of service and humanitarian functions, brings citizen concerns to Governments, advocates and monitors policies and encourages political participation”

2.3. BOOSTING THE DIFFUSION OF CSR

As previously reported, an important driver, which has contributed to the diffusion of CSR within the business, has been the reinforcement of the regulatory framework. In recent years, there has been a significant evolution of the regulations against the world of business, with tightening requirements in relation to the social and environmental impacts of enterprises and a renewed focus on the modalities of management and reporting. In this context, several new management models, standards, guidelines, even if not required by law, have emerged as reference framework, with an enlargement of the covered areas and a growing importance attributed to the topics of reporting and accounting processes.

As previously outlined, the main promoters of this change in the compliance framework were some international and supranational institutions such as the UN, the EU, but also the actions of some national governments played a significant role. In the following sections, three different experiences, which have promoted the diffusion of responsible corporate practices across businesses, will be briefly outlined: the *Global Compact* of United Nations, the experience of the European Union and the actions of the Italian government, which had their climax with the *National Action Plan on Corporate Social Responsibility 2012-2014*.

2.3.1. UNITED NATIONS GLOBAL COMPACT

The UN Global Compact (hereinafter GC) is a United Nations initiative aiming to encourage the businesses worldwide to adopt sustainable and socially responsible policies and practices and reporting their implementation. This global initiative was announced by the former UN Secretary-General Kofi Annan, in an address to the World Economic Forum in Davos, on January 31 1999, and it was officially launched at UN Headquarters in New York on July 2000 (Fiorani et al., 2012).

The UN Global Compact is the world's largest platform to boost the diffusion of CSR across the globe, with more than 8000 corporate participants and more or less 4000 stakeholders involved from 160 countries.

The GC is based upon two main objectives: 1) Mainstream ten *universal principles* in business strategies around the world; 2) Catalyze businesses actions in supporting broader UN goals, such as the Sustainable Development Goals (SDGs).

According to the official mission of GC, “*business’ sustainability starts when a company respects some of the fundamental responsibilities in the domain of human rights, employment, environment and fight of corruption*”¹⁵. Therefore companies which decide to adhere to GC must embrace, support and activate in their sphere of influence this set of ten key principles, divided in four main areas, reported in Box No. 1.

BOX 1. The Ten Principles of the UN Global Compact
Human Rights protection <ul style="list-style-type: none">• <i>Principle 1</i>: support and respect the protection of internationally proclaimed human rights• <i>Principle 2</i>: not be complicit in human rights abuses
Labour Standard defense <ul style="list-style-type: none">• <i>Principle 3</i>: guarantee the freedom of association and the effective recognition of the right to collective bargaining• <i>Principle 4</i>: eliminate all forms of forced and compulsory labour• <i>Principle 5</i>: demonstrate an effective abolition of child labour• <i>Principle 6</i>: eliminate discrimination in employment and occupation
Environment <ul style="list-style-type: none">• <i>Principle 7</i>: support a precautionary approach to environmental challenges• <i>Principle 8</i>: undertake initiatives to promote environmental responsibility• <i>Principle 9</i>: encourage the development, the diffusion and the innovation effort of environmentally friendly technologies
Anti-Corruption <ul style="list-style-type: none">• <i>Principle 10</i>: work against corruption, including extortion and bribery

¹⁵ www.unglobalcompact.org

The adhesion to GC is completely voluntarily and business do it for many reasons such as increasing trust in company, integrate sustainability issues within business activities in a proper way and create a long-term network with other organizations, expanding business opportunities.

This voluntariness could induce some opportunistic behaviors by businesses, such as the use of UN logo only for marketing and commercial purposes. Nevertheless, these kinds of attitudes are discouraged by the fact that participating firms must guarantee an annual publication called *Communication on Progress*, regarding the application of 10 GC principles throughout the enterprise.

The GC involves a spectrum of actors, such as: *governments* – which determine the legality and the universality of the initiative, creating the internal legal framework required for the implementation of CSR initiatives – the *enterprises* – which have to implement those mandatory changes in business operation – the *world of work*, the *organizations of civil society* – which confer credibility and social legitimization to the initiative – and other *multiple stakeholders* such us universities and research centers.

In general, it is possible to maintain that the GC contributes to the creation of a more sustainable and inclusive global market, introducing the respect and application of common values, an enhancement of the relations within businesses and society and a strengthened international cooperation for collective problems resolution. However, the GC should not be considered as a replacement of regulatory instruments and actions – which still remain government’s competences – rather a complementary initiative aiming to support the regulatory efforts of governments, helping the enterprise to correctly and responsibly operate in their sustainability path and thus achieving their national objectives through a series of international and local activities, which range from the promotion of awareness to the diffusion of useful resources and *best practices*, from facilitating long-standing partnerships to promote different initiatives on several critical themes ¹⁶.

¹⁶ The promotion of GC at national scale is guaranteed by the 85 existing Local Networks, which help companies and non-profit organizations to understand what responsibility means within the diverse national, cultural and linguistic contexts.

2.3.2. CSR IN EUROPE – CSR EUROPE NETWORK

A further important driver to the global diffusion of CSR has been the set of initiatives, formal definitions, management tools or promotional campaigns formulated by the European institutions.

The European Union has been actively dealing with the issue of CSR since 2001, when it presented the *Green Paper* “Promoting a European framework for CSR” aimed to foster the EU “to integrate in a structured way CSR in the European political agenda in order to make the EU the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with a greater social cohesion”¹⁷.

Since then, there has been the explosion of an increasing awareness among companies and each country’s interest has exponentially grown. In that context, CSR suddenly became the subject of several European initiatives (such as the “Multi-Stakeholders European Forums”) which all contributed to its strategic consolidation. The so-called *Renewed European Strategy 2011-2014 for CSR* was particularly significant; in it, the European Commission put the further definition of CSR as “the responsibility of enterprises for their impacts on society”.

This Agenda, whose renewal till 2020 has been recently discussed, aimed to renovate the promotion of CSR through various actions such as:

- Improve the visibility of CSR topics and disseminate good practices;
- Increase and track the levels of trust and confidence in business;
- Enhance market reward for CSR;
- Improve company disclosure of social and environmental information;
- Enhance the efficacy of CSR actions and harmonize CSR instruments;
- Guarantee a better alignment of CSR approaches at European level;
- Emphasize the importance of national and local policies related to CSR;
- Guarantee a greater integration of CSR into the domains of education, training and research, even with financial supports for specific projects.

Within the various European initiatives, particular relevance has also been assumed by the leading European business network for CSR called *CSR Europe*.

¹⁷ Commission of the European Communities (CEC), *Green Paper “Promoting a European Framework for CSR”*, Brussels, 2011

Through the adhesion of around 70 corporate members and 41 National CSR organizations, this network gathers over 10,000 companies and “acts as a platform for those business looking to enhance sustainable growth and supporting them in building sustainable competitiveness, positively contributing to society growth”¹⁸.

Created in 1995, CSR Europe launched in 2010 *Enterprise 2020*, an ambitious business-led initiative aiming to shape the business contribution to the EU’s *Europe 2020 Strategy*, the more comprehensive European strategy for the achievement of an “intelligent, sustainable and inclusive growth” at the Community level. This initiative has rapidly become the European movement of reference for companies committed to CSR and its launch has been particularly relevant for the achievement of some European policy objectives.

In order to foster the diffusion of CSR and improve business performances, this platform has launched some campaigns, such as the *Skills for Jobs initiative* – aimed to increase job opportunities and long-term employment – the *Sustainable Living in Cities initiative* – focused on the creation of sustainable alliances and sustainable urban planning strategies capable of tackling the social, demographic, environmental future challenges of the cities – the *European Automotive Working Group on Supply Chain Sustainability* – in the field of transport – the *Rebuilding Trust in Finance Initiative* and the *Ethics in Finance Initiative* – aimed at supporting banks and insurance groups in the integration of CSR and ethics in their operations – or the *CSR and Sustainability in Machine Tool Sector*. Within the campaigns launched by this European network, some communication initiatives are also relevant, such as the *European CSR Award* – a competition played at European level between responsible projects lead by businesses and aimed at substantially increase the awareness on CSR – or several informative activities concerning detailed studies, guidelines and updates in respect to the best practices.

¹⁸ www.csreurope.org

2.3.3. THE ITALIAN WAY TO CSR

The spread of CSR has also been promoted by some initiatives achieved at country level by national governments. In particular, in Italy the actions of central government has led to a vitality of business practices in the field of responsibility and sustainability. The Italian economy provides, in fact, an unique perspective on the relationship between CSR strategies and policies. Its industrial system differs from that of other European countries thanks to some distinguishing features such as: the dominance of Small and Medium Enterprises and their ability of rooting in, and relating to, the territory where they operate; the presence of local networks, based on informal and tacit relationships; a strong role played by those intangible assets of social capital (reputation, trust, legitimacy), considered fundamental to the performances of enterprises in the long-run. Therefore, *reinforcing a culture of responsibility* has become a sort of “mantra”, a priority for the central government, and CSR has been recognized as a qualifying element of the national productive system, able to strengthen the *Made in Italy* way of thinking thanks to a solid and rooted culture of responsibility. Actually, there have been multiple initiatives guided by government. Firstly, in 2002 the Italian Ministry of Labor and Social Affairs launched an innovative project on CSR, called *Corporate Social Responsibility – Social Commitment* (CSR – SC) aimed to promote CSR culture among businesses and to assure private citizens of the accuracy of several corporate reports on ethical and environmental issues (Perrini et al., 2006). Secondly, in 2012, the joint action of the Italian Ministry of Labor and the Ministry of Economic Development led to the approval of the *National Action Plan on CSR 2012-2014*, conceived as the pivotal instrument for promoting CSR ¹⁹.

This National Action Plan is organized according to the following objectives:

- a) *Increasing the culture of responsibility among enterprises, citizens and local communities*, through the creation of multi-stakeholder working groups (together with central and regional administrations), the development of public-private sector partnerships or initiatives of assistance and operational guides for enterprise integrating CSR into education, training and research;

¹⁹ The National Plan can be downloaded from the following website link:
<http://www.lavoro.gov.it/AreaSociale/ResponsabilitaSociale/Pages/default.aspx>

- b) *Raising citizens' awareness and avoiding unfair practices.* To give more strength to awareness raising, it is necessary to act towards consumers and citizens with the double goal of giving visibility to those virtuous enterprises and avoiding unfair conducts from them. In this sense, some visibility tools could be useful for responsible enterprises – such as *European CSR Award Scheme* – or the actions to improve consumers' level of trust;
- c) *Supporting CSR-adopting enterprises* through incentives, tax reliefs, awards and simplifications. In particular, specific emphasis is given to those public support actions which could encourage the adoption of CSR by SMEs, not always able to find the financial and immaterial resources needed for initiating and continuing over time a path to sustainability;
- d) *Contributing to the enhancement of "market rewards" for CSR* with the promotion of initiatives for sustainable investments or the promotion of public procurements integrating social and environmental criteria;
- e) *Promoting initiatives of social enterprises, social cooperatives and third sector, active citizenship and civil society organizations*, which have to relate more to for profit enterprises and offer to potential investors the utmost transparency by demonstrating their responsible commitment;
- f) *Encouraging transparency and disclosure of economic, financial, social and environmental information*;
- g) *Promoting CSR through internationally recognized instruments and international cooperation.*

Moreover, the diffusion of CSR was also encouraged through the creation, in 2006, of *CSR Manager Network Italia*, an Italian-specific network which aims to “spread the knowledge and share the best CSR practices”; in it, those experts of CSR or CSR Managers are actively involved in the management of social and environmental aspects of businesses ²⁰. The network promotes sustainable policies and supports several public initiatives addressed to political institutions, business associations, trade-unions and non-profit organizations (Fiorani et al., 2012)

²⁰ <http://www.csrmanagernetwork.it/network>

2.4. INSIDE CSR MULTIDIMENSIONALITY

After having examined the main driven forces which have fostered the CSR paradigm in last two decades, it is useful to provide a better insight into the internal structure of this multi-faceted concept, by looking at the multiple areas of responsibility, defined as *CSR domains* or *dimension*, which differ from each other according to how an enterprise relates itself to multiple stakeholders.

CSR, as already mentioned, is made up of several dimensions and multiple domains. Therefore, if the primary objective of an organization is to create *shared value*, acting as a *good corporate citizen*, the firm will have firstly to consider all the multi-faceted characteristics of CSR, implementing in particular those actions coherent with its mission and the vision of all its stakeholders.

Nevertheless, before going deeper into the multiple domains of CSR, it is useful to bear in mind the influence that four variables can play in CSR's implementation: the localization of the enterprise, the historical moment of reference, the specific business sector and the basic characteristics of the firm itself (Molteni, 2006).

CSR, indeed, differs according to the type of social, economic, governance and environmental system and what is deemed a business responsibility in one country may be regarded as a governmental, social or individual responsibility in another, and this is true even when comparing such relatively similar national business as the US and Western Europe (Moon, 2007).

With regard to the *localization*, the implementation of CSR is conditioned by the dynamics of the political, regulatory and cultural context in which an enterprise is located. The underlying rationales of juridical systems, for example, can vary from one country to another (*civil law or common law*), as well as the profile of environmental rules or the regulations in terms of work. All this factors thus contribute to demarcate the edges, beyond which the CSR starts. However, CSR can even diverge from one local territory to another, because various are the stakeholders related with a specific firm or different can be the local/regional policies which regulate certain subjects. Therefore, it is possible to refer to a *Territorial Social Responsibility*, if the synergies between businesses and local communities are crucial to promote economic, commercial and cultural success.

With reference to the variable *time*, it is important to notice that there is always a constant alternation of the problems which are attractive for the company management in a specific moment of history. A theme which can be relevant in a precise moment of time – such happened with the boycott of commercial activities in South Africa during the Apartheid regime – can lose its importance for different reasons, whereas new topics can emerge as central in the CSR debate (Molteni, 2006). The differentiation of CSR's practices can also happen at the *sectoral level*. Those business' domains connected to natural resources management – such as the extractive industry, chemistry, forestry – and to heavy industry, pay a lot of attention to environmental issues and to the safety of workers. Instead, in other sectors, the critical points coincide more with the impact of provided goods on the consumer's health, as it happens for tobacco or alcohol producers (Sacconi, 2005).

Finally, CSR can also assume a different profile even in relation to the *basic characteristics* of the enterprise itself, especially if considering the company size or the belonging to a cluster of enterprises. Indeed, the researches made until now (Marin et al., 2012; Poussing & Les Bas, 2014) agree with the fact that the commitment in responsible behaviors increases with the firm's dimension. Large firms are more efficient in CSR activities because they have larger and more independent boards with greater information processing ability, specific business units devoted to CSR and, generally, more financial resources to invest in costly and intensive responsible activities. On the contrary, small companies may experience more difficulties than large enterprises when engaging in social actions that do not have an immediate return, because they could lack the required financial resources or the internal organizational competencies in order to implement a successful CSR. However, this obstacle could be overcome thanks to the creation of specific local clusters of enterprises (such as the Italian *APEA*²¹ or the *Eco Industrial Park*). These experiences, based on the theoretical principles of industrial ecology, are “ideal combinations of enterprise” which can play a crucial role in driving innovation, productivity and the social-environmental-economic competitiveness, fostering greater logistical efficiency, ease of collaboration and mutual trust (Linee Guida APEA, 2009).

²¹ APEA is the acronym of *Aree Produttive Ecologicamente Attrezzate*

2.4.1. THE MULTIDIMENSIONALITY OF CSR

CSR can be distinguished in different domains that principally relate to those multiple stakeholders influenced or influencing the activities of an enterprise.

In general, these domains can be clustered in two main dimensions: an *internal* perspective – which includes a shareholder domain, the risk management department and the area of human resources management – and an *external* perspective concerning the relationship with the customers and clients, the suppliers, the community, the media and the natural environment.



2.4.1.1. INTERNAL DIMENSION OF CSR

The inner dimension of CSR mainly refers to those domains of responsibility related to the internal sphere of an enterprise. Three main dimensions belong to this first categorization: the shareholder domain, the risk management department and the area of human resource management.

- *SHAREHOLDERS' DOMAIN*

Management gives primarily importance to the economic responsibility towards the business' shareholders and this is a fundamental responsibility which must be achieved by every corporation, because a firm, sensitive to some social issues, but unable to pursue a long-term development project to create richness, is also destined to fail with its CSR purposes (Perrini, 2002). These responsibilities towards the enterprises' shareholders are represented by the purpose of developing long-lasting relationships within the company and among investors, as well as aiming to guarantee transparency, complete and timely communications with analysts and investors. Therefore, one of the first responsibility of each company is to ensure the respect of those conditions which can guarantee a sustainable economic growth, thus allowing the achievement of long-term profits and increasing dividends and increasing levels of quality and efficiency (Sacconi, 2005).

- *EMPLOYEES AND HUMAN RESOURCE MANAGEMENT*

Another fundamental internal responsibility concerns with the modalities through which an enterprise establishes collaborative relationships with all its employees. The professional quality of men and women who work in the business and, more generally, the strengthening of human capital, are some of the essential components which can consolidate the firm's competitiveness. In order to be able to carry out their work effectively and safely, it is important that personnel would receive an ongoing training and that their skills would be continuously developed.

The spectrum of internal actions activated in this domain by the management is heterogeneous and it could include:

- The activation of internal communication systems and dialogue with employees, aimed at distributing information at all company levels and promoting a uniform corporate culture that could allow correct conducts, improve the corporate climate, install great confidence in the firm and stimulate an active participation of personnel (periodic meetings, company day care);
- The promotion of equality of opportunity and treatment in employment, especially for women, ethnic minorities, disabled or immigrants;
- The abolition of any discrimination based on race, color or sex
- The provision of fair working conditions and fair wages;
- The adoption of remuneration and reward policies which, for example, would recognize those employees who achieve high levels of performance and respect company values while maintaining adequate production levels;
- The promotion of internal mobility through a job posting system accessible to all company staff;
- The support of worker's families and the promotion of the those actions which can enable employees to reconcile their work commitments with their personal needs (part-time jobs, reduced and/or flexible working hours, maternity leave, nursery and counseling service).

Basic business responsibilities also include the respect of the international labor standards, guaranteeing, for example, the freedom of association and the right to have representative organizations for the purpose of collective bargaining, or respecting the minimum age for admission to employment in order to secure the effective abolition of child labor (Perrini et al., 2006).

Fundamental in this internal domain are also those issues of health and safety in the workplace. Indeed, the protection of workers is more and more considered a matter of primary importance for every enterprise, and therefore companies, in order to comply with the legislative norms²², have to implement different internal prevention and protection system, pursuing continuous improvements and ensuring an integrated involvement of the staff.

Lastly, with regards to internal human resource management, the provision of several training programs and refresher courses for the employees are also important. In fact, in order to perform efficiently, the workforce must be constantly trained and informed and the whole human capital of the enterprise accrued. Therefore, the provision of training courses – consistent with the vision and the long-term objectives of the company – represents a fundamental tool for an organization in order to remain competitive and properly address the multiple challenges imposed by the market and caused by the macro-structural changes in the global arena.

- *RISK MANAGEMENT DOMAIN*

The existence of a business risks management system inside a group is another essential component of the *internal* corporate responsibility. Specific internal policies must be defined for each type of risk, with the primary goal of meeting the guidelines, respecting the organizational/managerial principles and providing the needed techniques for a pro-active management of the related risks. Therefore, an Enterprise Risk Management model (ERM) must be taken into account when considering a full-structured CSR, because it regulates the roles of the various actors involved in the risk management processes, while focusing on the *financial* risks (interest rate, exchange rate, spread), *credit* risks, *operational* risks (ascribable to asset ownership, processes, procedures) and *reputation* risks (thus maintaining a positive perception that stakeholders have of the Group). In this respect, an internal risk management department should be created, in order to coordinate the integrated process of risk's management, design the specific programs and policies, implement specific Key Risk Indicators (KRI) and ensure a periodic monitoring (Molteni, 2004).

²² In Italy the issue of health and safety in the workplace is regulated by the *Legislative Decree 81/2008 for the prevention and protection of workers from workplace health and safety risks*

2.4.1.1. EXTERNAL DIMENSION OF CSR

The external dimension of CSR, instead, concerns all the relationships an enterprise can have with the external environment and its committed stakeholders. Therefore, the following areas of responsibility belong to this dimensions: the consumers/clients domain; the suppliers area; the natural environment domain and the societal and community field.

- *CONSUMERS' DOMAIN*

The external customers are considered one of the most important category of stakeholders and they represent a central feature of every CSR report, as they are vital for the corporation's long-term survival (Oberseder et al., 2013).

Nowadays, as previously stated, the consumption choices are more and more sensitive to several social criteria, such as the respect of human rights or the protection of natural environment, and therefore the companies are by now aware that their economic success could also depend on the adoption of some social responsible criteria and of transparent communications initiatives, considered essential for the development of an honest, correct, trustworthy and long-lasting relationship with customers. Hence, in order to guarantee a complete customer satisfaction, an enterprise could, indeed: provide its products or services in line with the customers' tastes and with the higher quality standards; act in order to establish personalized relationships with the individual customers, *vertically* or *horizontally* differentiating its final production; treat the customers equitably, offering them fair conditions; communicate honestly and openly, facilitating the communication channels and making relations faster and the information flow more immediate (Oberseder et al., 2013). Moreover, a responsible company, careful of the quality nature of its relations with customers, should implement those set of actions, aimed at enhancing customer protection, avoiding customer's discrimination practices, and providing them information on the characteristics of a specific product.

As pointed out by McWilliams and Siegel (2001), there exists a certain demand for CSR attributes by the side of consumers, which is determined by different variables: the price of goods with CSR attributes and the price of their substitutes; the intensity of advertising in an industry; consumer income and personal tastes.

Therefore, a responsible firm must devote a certain amount of resources to satisfy that demand for CSR. In order to determine that optimal level of CSR investment, which would maximize profits while satisfying the demand of CSR, managers “*should to treat decisions regarding CSR precisely as they treat all other investment decisions, by doing a cost-benefit analysis*” (McWilliams and Siegel, 2001).

- *SUPPLIERS’ DOMAIN*

Undoubtedly, businesses have also a certain degree of responsibilities towards all the external suppliers which compose their supply chain, since they are increasingly evaluated by their supply chain performance (Oberseder et al., 2013). The services and goods purchased from suppliers have an increasing impact on the quality and the external image of the company and it has been demonstrated how the consumer perceptions and his attitudes towards a specific brand can be seriously affected by supply chain issues (Porter and Kramer, 2006). This is why, it is important for a CSR committed firm to carefully manage its supply chain, paying special attention to the social and environmental issues considered as critical. A company should carefully select and evaluate the suppliers on the basis of principles of transparency, clarity, integrity and non-discrimination. On the contrary, it is important that, in conducting business relations with an enterprise, the suppliers would carry out their activities in respect of the principles and values laid down in the Ethical Code, which commonly consider fair wages, non-discrimination practices, protection of worker safety, ban of child labor or care of the environment. Moreover, responsible companies can also try to push their suppliers to look after of their own supply chain, increasing their awareness on CSR, educating and providing them with the resources to improve their own CSR programs. This dimension is especially relevant for those transnational firms which operate in developing countries, with weak or absent regulation and control mechanisms (Scherer and Palazzo, 2009). Some multinational corporations have, in fact, been harshly accused, especially in the ‘90s, for the existence of bad working conditions and practices in their supply chain, including child labor and slave labor. Therefore, since then, many multinationals have started to adopt several environmental/social standards and certifications – such as the SA8000, ISO 14001, ETI certification or FSC certification – extending them through their supply chains in the form of “requirements for the suppliers”.

- *NATURAL ENVIRONMENT DOMAIN*

In times of climate change and growing environmental demand, enterprises feel a greater responsibility also towards the natural environment in which they operate. This is happening because, over the recent years, the growing pressure arising from a variety of sources has made the environmental dimension a long-term crucial issue for many corporations, transforming the environmental management into an essential component of business (Dechant et al., 1994). The success of this new kind of *business environmentalism* has been also supported by several studies which, in the meantime, have demonstrated how the implementation of environmental-friendly policies could have had positive effects on the financial performances of a company, reducing liability costs and revealing previously unseen opportunities. Therefore the so-called Corporate Environmental Responsibility (CER) has progressively become a *hot topic* in the management debate concerning CSR. CER is a concept which refers to the effects of the firm's activities on the natural environment, embracing different perspectives such as environmental management, environmental disclosure and environmental performances (Albertini, 2013).

There are many environmental practices belonging to this field of corporate responsibility which can be customized to a company's specific business and market, as reported in Box No. 2.

BOX 2. Practices of Corporate Environmental Responsibility

- A correct business compliance with the environmental legislation (national, regional or local) and with all requisites stemming from contractual agreements and protocols stipulated with third parties;
- Disclosure of the environmental policy of the company to external parties in order to communicate the company's environmental effort, through the use of suitable related indicators, specific informative campaigns or eco-labeling tools;
- A regular monitoring of the environmental performance of company's activities through the use of special indicators for each significant environmental aspect;
- Promotion of all those activities aimed at preventing or reducing pollution (thus improving the quality of air and water), containing and reducing consumption of natural resources, recycling/reusing raw materials and wastes, minimizing the wastewater use or reducing the production and the hazardous nature of wastes;
- Investments in R&D to create innovative products and production processes able to reduce the negative environmental impacts (*eco-innovations*) and the use of specific *environmental-friendly* technologies and appropriate ecological standards in order to constantly increase the safety and the environmental compatibility of the activities, as well as productivity;
- Reduction of the intensity energy usage and increase in energy efficiency related with a growing production of "clean" energy and disinvestments from polluting fossil fuels;
- Application of the principles and instruments of the *Industrial Ecology* such as the *Substance & Material Flow Analysis*, the *Input-Output Analysis*, the *Life Cycle Costing*, the *Life Cycle Design* or the *green process/product design*;
- Engagement of the corporation in those *voluntary environmental corporate programs*, such as the environmental management systems like ISO 14001 or EMAS, in an effort to move beyond the traditional regulatory "command and control" relationship;
- Use of specific internal audits aimed at verifying the correct management of the environmental problems connected with enterprise plants;
- Active involvement of company personnel in order to spread and raise awareness regarding the corporate environmentalism through targeted information and specific training courses on environmental issues.

- *SOCIETAL AND TERRITORIAL COMMUNITY INTERACTION*

The last dimension, inside which CSR should be considered, concerns the direct or indirect responsibilities that companies bear towards society and local communities.

In a complex economy, a firm can increase its capacity to innovate and thus create Shared Value not only thanks to its own internal competencies and efforts, but also thanks to those benefits deriving from the external cooperation and the acquisition of knowledge and scientific expertise from outside (Porter and Kramer, 2011). This mutual relationship should be considered as crucial when dealing with a multi-faceted issue such as CSR, because an irresponsible behavior could delegitimize the firm's position in respect to a territorial community. So, a corporation, wishing to consolidate its production activities in a specific territory, desirous to achieve long-term objectives of sustainable growth and creating economic value, should firstly establish new and trustful forms of interactions with the societal community in which it operates, offering added-value services and thus addressing the needs and expectations of society (Molteni, 2004). In this sense, the competitiveness of a company and the health of the communities around it are closely intertwined, and the process of value generation become thus a collective action, the result of a synergic interaction between a plurality of parties (Porter and Kramer, 2011)

Undoubtedly, the activities of certain enterprises (such as heavy industry, chemistry or energy facilities) can have major impacts on a local-territorial dimension and therefore they could require the adoption of more stringent management measures, always coherent with the specific territorial dimension.

No business can solve all the critical societal issues or bear all the costs of doing so, but it's undeniable than an effective and well-structured CSR would constitute a tangible opportunity to create a healthy value for each side, according to a *win-win* perspective.

However, the achievement of a *win-win* situation, in which Shared Value would be created, firstly requires an identification, by the side of enterprise, of those societal issues that mostly intersect with business actions, and also a deep understanding of all the negative impacts deriving from those activities (Porter and Kramer, 2006).

Once again, the range of responsible actions towards local societal community is wide, and it can be described through a useful box representation, as below.

BOX 3. Firms' responsible practices towards the local community

- The establishment of a constant dialogue and a constructive interaction with all the social stakeholders (local authorities, citizens' associations, organizations of civil society, NGOs) through various channels, such as radio broadcasting, public lectures, seminars, workshops, conferences, education projects for schools or guided tours of the facilities;
- The creation of specific and innovative channels of dialogue and debate between the firm and the societal community of reference, such as the *Local Committees*, established on a provincial or regional basis and conceived to ensure a deeper relation with the local community, thanks to the promotion of consultation and participatory planning events. These committees have been established, for example, by Italian Iren Group, an Italian multi-utility company operating in the sectors of energy and environmental services, which defines them as "*a new structured channels for the exchange of views that improve the local community of reference*"
- Involvement in cultural, innovative, environmental and educational projects, in cooperation with local institutions;
- Provision of financial or "product" charity donations in the territory (assistance, healthcare, education, culture, sport);
- Sponsorship of different cultural or sports events;
- Protection and reinforcement of the territorial cultural heritage;
- Support of local employment through the provision of job opportunities in the region for local people and local suppliers;
- Constitution of charitable foundations and initiatives in favor of needy people or disadvantaged areas, such as the corporate volunteering projects;
- Implementation of innovative initiatives and activation of joined research projects with the universities, in order to develop projects of technological innovation and thus to disseminate the scientific and technological culture throughout the whole geographic area.

2.5. THE DEGREES OF CSR ENGAGEMENT

Subsequent to the analysis of drivers and CSR dimensions, it could be interesting to establish a further classification, taking into account the different degrees of CSR engagement, by reporting the “*five-step model*” formulated by Mario Molteni (2007), in which the author traces the hypothetical steps of a gradual evolutionary process, through which CSR logics could be integrated into a business strategy.

1. INFORMAL CSR

The first stage of CSR commitment is called *Informal CSR* and it's generally characterized by single practices not related to any explicit CSR strategy. In this stage, companies tend to look at CSR in a minimalistic way, engaging in CSR initiatives principally because of external pressure. In this sense, CSR is not a passion, but more a necessity, used for short-term strategic reasons such as, improving corporate reputation (Oberseder et al., 2013). This kind of commitment can be compared to the so-called *responsive CSR*, identified by Porter and Kramer (2006). Enterprises, at this first stage, typically focus on three stakeholders groups (customers, employees and shareholders) because showing responsible behaviors towards them is necessary for corporate survival.

The transition from this step towards the second one is usually induced by a renewed awareness of top management on CSR topic, deriving from the increasing needs to respond to pressures coming from mid-term managers, employees or “early” external competitors.

2. CURRENT CSR

In the second stage, defined as *Current CSR*, the enterprises usually start to carry out some of the “classical” CSR practices such as the publication of a *Ethical Code*, the draft of a *Social or Sustainability Report*, the obtainment of some *international certifications*, or the realization of some *Caused Related Marketing campaigns*.

Nevertheless, the implementation of this phase requires, as outlined, a determined commitment by top management and the governing body of the enterprise, because it involves some important monetary investment.

However, it's difficult, even at this stage, to implement those CSR practices able to bring significant changes, because the long-term orientation of a responsible strategy is not yet fully anchored in the thinking of top management or widespread enough among employees. So, a company runs some risks which may be counterproductive, such as being accused of simply using CSR as a marketing ploy or that its social-environmental commitment is a simple formal compliance, a *green/social washing* technique²³ (Porter and Kramer 2006).

Notwithstanding, it may also happen that these practices, if adopted with professionalism and physiologically experienced by the enterprise, could be capable to trigger an authentic transformation process, allowing the transition to the next phase of the evolutionary development: the top management, finally convinced of the effectiveness of a well CSR strategy, could start to re-think how to deeply modify the configuration of business with respect to the principles of social and environmental sustainability.

3. *SYSTEMATIC CSR*

This third phase of the model is represented by the so-defined *Systematic CSR*. The achievement of this stage would imply the embedment of a social and environmental perspective within the corporate culture and policy and the establishment of a CSR strategy rooted in the business value chain, producer of goals and targets and considered as a real conviction (Molteni, 2007). In order to achieve this objective, the company should therefore: “insert” CSR in the business value chain, in order to identify the challenges and the opportunities related to the different strategic areas of company's activities; activate and reinforce the dialogue with all the company's stakeholders in order to include them in a three-dimension of *co-planning*, *co-formulation* and *co-fulfillment* of responsibilities, identifying all solutions and potential synergies; use and adopt the best practices or the innovative solutions implemented by other firms or proposed by specialized bodies, imitating and integrating them with corporate action.

²³ Some corporate responses, such as the sustainability reports of multinationals, are still nowadays accused of conceiving CSR, neither from a strategically nor operationally perspective, but mostly for cosmetic opportunism, simply aggregating, for example, anecdotes and data about uncoordinated initiatives, in order to demonstrate a generalized social sensitivity

In this third step, there could be a real improvement of CSR, because responsible principles are by now consolidated and integrated in the organizational structure and CSR is managed with professionalism by top and middle management. Companies at this stage, for example, can introduce specific CSR departments and activate the figure of *CSR Manager*, responsible for the coordination of all CSR activities, and designated to engage in intensive dialogues with all the stakeholders. Companies can even implement more drastic measures such as releasing a Code of Ethics even for the suppliers or inserting social-environmental measures inside the logics of performance evaluation, according to a multidimensional model such as the *balanced scorecard*.

4. INNOVATIVE CSR

In the fourth phase of the model, Molteni considers the CSR as *innovative*. An enterprise, at this stage, is looking for those innovative solutions (such as organizational-marketing innovations or process-product innovations) capable of creating tangible competitive advantages to the company and guaranteeing a simultaneous satisfaction of different social and economic expectations, beyond the limits set by law (Perrini et al., 2006). CSR is thus transformed into an intangible asset, crucial for company's survival and growth, because able to influence its long-term competitive advantages. These advantages, according to Molteni (2004), can be fulfilled through the implementation of the so-called *socio-competitive synthesis*, better defined as "*those business innovations which permit to satisfy the expectations of different classes of interlocutors, beyond the limits prescribed by law, while contributing, in the meantime, to support the business performances on a long-term horizon*".

There are several examples of enterprises which have implemented these kinds of *synthesis*. Within them, Molteni includes: Merloni, Illycaffè – which has developed since the early '90s new forms of direct cooperation with local coffee farmers in Brazil and Guatemala, promoting the transfer of skills, knowledge and competencies or the case of Coop Adriatica (Molteni 2004).

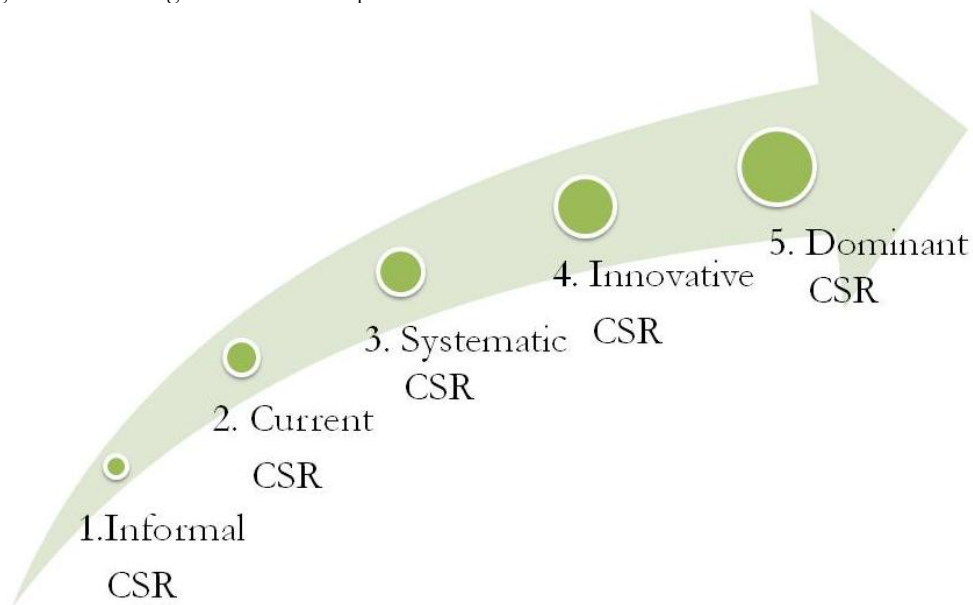
Moreover enterprises, at this advanced stage of CSR development, are generally more innovative, compared to their pairs, as they are more prone to invest in R&D projects or to collaborate with research centers.

5. DOMINANT CSR

Lastly, the fifth and final stage of this evolutionary pathway is the one in which the CSR is *dominant*. In this last phase the *responsibility paradigm* should be deeply internalized within all the business units, and the CSR should constitute the basis of business strategy and influence all its actions. The enterprises, in this sense, should be able to develop a macro-organizational model in order to pursue a greater interaction between the process and the activities carried out in terms of CSR, Enterprise Risk Management (ERM) – which, as mentioned above, is another fundamental dimension of modern and virtuous enterprises – and the processes of strategic planning. In a *dominant* stage of CSR, a corporation should integrate CSR management into the upstream phases of strategic planning process, considering in a synchronous way the corporate strategic objectives, the objectives in the CSR domain and the potential risks associated, in order to maximize the further creation of value (Molteni, 2007). A real example of this last CSR stage is well represented by the strategic management plan of Luxottica, the most important Italian eyewear company (Fiorani et al., 2012). Its integrated strategic plan envisages different phases: 1) Context analysis and individuation of exogenous risks; 2) Definition of strategic guidelines (included the one of CSR) by the board of directors and identification of strategic risks, directly associated to the objectives of industrial plan and related to competitive factors at the macro-level; 3) Formulation of strategic objectives (included the CSR goals) and identification of related risks; 4) Strategy deployment and analysis of risks related to operational targets; 5) Reporting and Monitoring of the degree of the achievement of those global targets and of associated risk's levels (i.e. Sustainability Report).

Moreover, as already stated for what concerns the stage of *Innovative CSR*, an enterprise which applies a *Dominant CSR* strategy is usually considered also an advanced innovator company. Indeed, the monetary cost-savings deriving from a rationalization of resource/energy use or from the gains in the overall firm's efficiency (made possible by CSR) can be employed for the adoption of new technologies or innovative solution, which can enhance the competitive advantage of the adopter's firm, as compared to markets' competitors. This can be true, especially for the eco-innovations, thus those innovative solutions with direct or indirect environmental benefits.

Figure 10. The stages of CSR development



Source: re-elaboration of the author, from Molteni (2007)

2.6. THE INSTRUMENTS OF CSR

The success of CSR paradigm has modified both opportunities and limits within which the companies can act. As it has been showed, the mere pursuit of short-term profits aiming at satisfying business' shareholders is no longer sufficient, since nowadays, firms have to take into account the several needs and instances coming from those stakeholders able to influence their success, and search for some sort of balance with their interests and the ones of social system.

Therefore, those companies which wish to effectively manage CSR and the exponential number of sustainability issues, must be able to communicate and offer a concrete evidence of their real commitment to a continual long-term improvement. Responsible-oriented enterprises must adopt a set of appropriate instruments in order to measure, control and evaluate their corporate performance and the degree of satisfaction of stakeholders. In this respect, over the recent years many innovative management solutions have been developed in order to evaluate the economic, social and environmental performance, while providing information of a qualitative, quantitative and economic nature (Perrini et al., 2006).

An increasing number of companies, has started to recognize the importance of demonstrating their CSR commitment through clear and verifiable data, considering the adoption of suitable CSR management tools able to measure the social and environmental performances and integrating them with the traditional financial information (Molteni, 2004).

In the following section, some of the principal voluntary instruments, which companies can adopt in order to certificate and show their CSR commitment, will be examined, taking into account a classification which divides between: social performance instruments; environmental instruments; sustainability instruments and those related to the corporate reputation management.

2.6.1. SOCIAL PERFORMANCE INSTRUMENTS

In order to measure and verify the social impact of an enterprise, several management tools have been developed over the last decades, and their diffusion incentivized among the world of business.

2.6.1.1. SOCIAL AUDIT

Social audit can be defined as “*the control, at a given time, of the impact which the activities of an organized system have on the well being of the individuals that in some way interact with the company*” (Perrini et al., 2006). The first social audits (also known as social reports) were developed between the late nineteen sixties and the early seventies in the US and then in Europe, especially in Germany and France, even if there had been an important acceleration of their diffusion and adoption only from the end of ‘90s (Perrini, 2002). These reports are voluntary tools subject to the influence of specific variables of cultural, political and economic nature and thus the methods adopted by companies can diverge in content and final objective. A social report constitutes an annual document, draft by companies, in order to integrate the ordinary balance sheet – trough which an enterprise wish to communicate its fundamental financial features – with information about the qualitative and quantitative nature of their relationships with the multiple categories of stakeholders. Therefore, the social audit is used to strengthen the dialogue with the stakeholders, increase the management sensitivity towards their requests and aggregate the consensus around the development plan of the firm (Molteni, 2004).

The motivations behind the elaboration of this annual document can differ from firm to firm, and can be summarized as follows:

- Strategic motivations, such as the reconsideration of corporate mission, the involvement of top management in CSR issues or the introduction of new decision-making principles within the corporate governance;
- Increase the business' visibility and transparency and improve the external image and reputation of the company;
- Enhance the culture of responsibility within the business' edges and improve the corporate climate, favoring the sense of belonging;
- Allow a better understanding of the needs of a specific territory and improve the relationships with clients, suppliers, banks, public administration and investors (e.g. those related with ethical finance);
- Encourage the evolution of a comprehensive information collection systems and the introduction of new control procedures.

2.6.1.2. ETHICAL CODE

The Ethical Code (often called Code of Ethics) can be considered as the *complementary* instrument of social reports because, while these latter are mainly oriented to the control of company's policies, the former, instead, is responsible of management of individual behaviors. This document, drafted again on a voluntary basis, can be defined as the "Constitutional Charter" of the enterprise, because it contains a complex of rights and moral duties which define the social and ethical responsibilities of each member of the corporation, the lines of conduct and the basic principles of the company (Perrini et al., 2006).

The Ethical Code is an effective instrument which prevents irresponsible behaviors or illicit from the agents who may act on behalf of the company, because it introduces a clear and explicit definition of the social and ethical responsibilities of executives, managers, staff and sometimes of suppliers (Sacconi 2005). This instrument is nowadays diffused worldwide, and it's used to favor the implementation of an integral culture of ethics and responsibility within the business' boundaries and, in some cases, its respect constitutes a duty also for the suppliers of a company which adopts it.

2.6.1.3. SA8000 STANDARD

Another important instrument, used in the domain of corporate social performance management, is the Social Accountability 8000 standard (SA8000), elaborated in 1997 by Social Accountability International (SAI). When firstly introduced, SA8000 represented a significant innovation since it was one of the first auditable social certification standard, whose application had to be verified by an independent third party. Based on the conventions of the ILO and the UN Declaration of Human Rights, SA8000 is an international “auditable” certification which spans industries and companies to create a common language to measure social performance while guaranteeing the respect of fundamental workers’ rights within their business’ boundaries (Fiorani et al., 2012).

SA8000 is modeled on ISO standards, and therefore it requires that companies, aiming to gain and maintain this certification, would integrate it into the their management practices, demonstrating an ongoing conformance with the criteria. The standard represents an important instrument for those corporations willing to demonstrate a serious commitment to carrying out processes and products in a really ethical way, thus enhancing their reputation and improving the relations with institutions. SA8000 measures the performances of enterprises in eight important areas: child labour and forced labour; health and safety; working hours and fair compensation; worker’s discriminations; disciplinary practices and free association and collective bargaining. According to the most recent statistics, at 14th January 2016, there are 3663 business companies²⁴ certified worldwide, 1081 of which are in Italy.

2.6.2. ENVIRONMENTAL PERFORMANCE INSTRUMENTS

As previously demonstrated, companies are more and more committed to integrate their business activities with the use of criteria of environmental protection and efficiency, controlling their environmental impacts in accordance with the principles at the base of the *Green Economy* model.

Therefore, there exist several instruments which can be used to measure the specific Corporate Environmental Responsibility of a group.

²⁴ <http://www.saasaccreditation.org/?q=node/23>

2.6.2.1. CORPORATE ENVIRONMENTAL REPORTING

Environmental reports are defined as those “*documents of communication which contain information of qualitative and quantitative nature, aimed at illustrating the strategic plan of a firm to reduce its environmental impact and the current business’ positioning in term of global environmental performance*” (Azzone et al., 1997). These documents are used to better manage the environmental activities of the firm and support communication with the stakeholders, especially those interested in environmental issues. A careful communication strategy must, in fact, make the stakeholders aware of the degree of *eco-compatibility* of production processes and products, and provide reliable information related to company’s environmental attitude. Drawn up on a voluntary basis, these *environmental* documents reflect the specific corporate, economic, legal and social context in which they’re developed, therefore, there is no homogeneity among the reports, coming from different companies, and comparisons can be difficult.

These reports can contain various indicators. Among them it is possible to find:

- Measures of the level of effort to reduce the impact on natural resources, such as the quantity of total emissions avoided by a plant, the quantity of wastes treated/handled, the impacts on the local biodiversity or the improvements in the energy use and energy efficiency;
- Environmental costs, such as the recovery cost of a polluted area, the costs derived from environmental taxation, or the amount of money saved thanks to interventions of operating efficiency or technological improvement;
- Information concerning all the initiatives promoted to improve the *green image* of business, such as the activities of prevention and safeguard in protected areas or the internal initiatives of environmental awareness and education.

2.6.2.2. ENVIRONMENTAL MANAGEMENT SYSTEMS

An Environmental Management System (EMS) refers to the “*management of a corporation’s environmental program in a comprehensive, systematic, and documented manner*” (Azzone et. al, 1996). In the Environmental Economics literature, an EMS is defined as a voluntary instrument which outlines specific responsibilities and procedures for the management of those environmental issues relevant for a certain company, and whose adoption requires a continuous commitment for the achievement of ongoing improvements in the environmental area (Perman et al., 2011).

One of the main objectives of an EMS is to help the business' management to identify the main environmental concerns, coordinate all those activities with an environmental impact and distribute specific responsibilities for their correct management and resolution. The underlying philosophy of each EMS is to “*actualize a virtuous circle of planning and realization, focusing on four fundamental actions (Plan, Do, Check, Act) that, according to a circular logic, interact between each other and ensure a constant updating of the system*” (Tinacci Mossello, 2008).

The most commonly used standardized EMS are the ISO 14001 (with its last version launched in 2015) and the Eco Management and Audit Scheme (EMAS), developed by the European Commission and revised three times since the first approval in 1993. These standards are complementary, but EMAS *goes further* than ISO 14001, because it considers additional elements and stricter requirements on measurement and evaluation of performances. Moreover, the criteria required for ISO 14001 certification are equal to those demanded by EMAS, therefore this latter attests that the conformed organization already has an environmental system which complies with the requirements of ISO 14001²⁵. Hence, it happens that companies firstly certify themselves to ISO, then, if they have enough internal competencies and financial capacities, take a further step forward and conform to EMAS (Perman, 2011).

As already stated, the advantages a company can obtain by introducing an EMS are of organizational, managerial and economic nature and can include:

- Improvements of the environmental and financial performances, through the implementation of a systematic framework able to guarantee, for example, cost savings through increased resource efficiency (reduction of energy use or in the use of raw materials);
- An increased trust between firms and regulatory authorities and a greater compliance with regulatory standards. A correct implementation of an EMS allows, in fact, corporations to be more familiar with the relevant legislative requirements, and thus better prepared to tackle regulatory issues in a systematic way. The organizations consistent with an EMS may be, indeed, subject to fewer environmental inspections or reduced waste fees, and have a better access to public contracts (Tinacci Mossello, 2008);

²⁵ http://ec.europa.eu/environment/emas/pdf/factsheet/EMASiso14001_high.pdf

- A strengthened company's reputation with a greater improvement also of its credibility and reliability. The disclosure of credible and transparent information on environmental performances, externally disseminated throughout a periodical environmental statement and validated by an independent and accredited environmental verifier, is an important element when companies engage in a stakeholders' dialogue;
- A better evaluation of corporate risks with a reduction of negative incidents and fewer serious occupational injuries. By screening the operational procedures, the companies can find those methods to analyze, control, evaluate and reduce the associated risk levels;
- Improved employees' empowerment and enhanced human capital. The implementation of an EMS can, indeed, improve the relationships within the staff, provide a clear and coherent definition of responsibilities and enhance the full value given to in-company competences (Molteni, 2004).

2.6.3. SUSTAINABILITY PERFORMANCE INSTRUMENTS

An enterprise devoted to CSR should also be able to adopt those instruments in order to adequately measure its whole sustainability performance. In this sense, recently there has been the emergence of some instruments aimed to fulfill this goal, responding to the logic of *Triple Bottom Line*, thus considering the Social, Environmental and Economic perspective as a whole. Within them, it's important to consider the so-called Sustainability Reports, the Sustainable Balanced Scorecards, the Keys Performance Indicators and ISO 26000 standard: all tools oriented toward the pathway of long-term sustainability.

2.6.3.1. SUSTAINABILITY REPORT

A Sustainability Report is, so far the main reporting and transparency document of a corporation, used for the external and internal communication of company's commitment to CSR and its whole sustainability performances. This Report can be used as a management tool which enables the company to monitor the corporate results and to define the objectives for the future, in accordance with the principle of continual improvement.

The sustainability report contains an overview of those actions and results achieved by a group from year to year in an economic, environmental and social context, and it constitutes the main informative instrument for the dialogue with stakeholders, describing the profile of the enterprise according to an integrated approach, in order to value its overall performance in terms of economic prosperity, social cohesion and environmental protection, within a perspective of safeguarding of the future generation's rights (Iren Group, 2014).

Sustainability reporting can be considered as synonymous with other terms for non-financial reporting such as *triple bottom line reporting* or *CSR reporting*.

This kind of Report can be conceived as the integration or the *sum* of the social and the environmental report previously analyzed, and many companies of all types, sizes and sector from every corner of the world, nowadays mainly focus on the release of this integrated and comprehensive document (Perrini et al., 2006).

A robust Sustainability Report includes a regular program of data collection, communication and responses and is far more than a mere data gathering or compliance exercise because it's able to bring enormous benefits to the reporting organization. Among them, there is an increased understanding of risks and opportunities; a strong influence on long-term management strategy and policy; a mitigation of negative environmental, social and governance impacts and improvements in reputation and brand loyalty.

As already stated for what may concern the environmental reports, even the domain of the Sustainability Reports can be wide and heterogeneous, differing from business to business and still today no consolidated rules for a common reporting procedure exist (Perrini et al., 2006).

However, especially at international level, we are witnessing the emergence of different multi-stakeholder projects aimed to develop, promote and disseminate common frameworks to harmonize the voluntary commitment towards corporate sustainable responsibility. The major providers of these sustainability reporting guidance include the Global Reporting Initiative framework (GRI), firstly launched in the autumn of 1997, or the AA1000 Standard, outlined inside Box number 4.

BOX 4. International sustainability reporting guidelines

Global Reporting Initiative – GRI

The GRI network includes the active participation of companies, entrepreneurs' associations, workers' associations, research institutes, universities, government representatives, NGOs, rating agencies, auditing firms and also associations of chartered accountants. Of the world's largest 250 corporations, 93% report on their sustainability performance and 82% of these use GRI's Standards to do so. In the database of GRI over 18,000 reports using the standards proposed are recorded ²⁶. In 2013 GRI released the fourth generation of its guidelines, named G4, offering reporting principles, standard disclosures and an implementation manual for the preparation of sustainability reports by organizations of any size and sector. This process was the outcome of a constructive dialogue implemented at international level, which saw the joint participation of the UN Global Compact and the World Business Council for Sustainable Development. The guidance in G4 is designed to be compatible with a range of different reporting formats, offering a widely recognized global standards for sustainability information to be included in integrated reports.

Accountability A1000 Standards

In order to make the sustainable accountability more uniform and to allow a comparison of social reports coming from different sources, in November 1999 the ISEA – Institute of Social and Ethical Accountability – published the series of AA1000 accountability standards, designed to ensure the quality of the social and ethical accounting, of auditing and reporting process, thus *“helping the organizations become more accountable, responsible and sustainable”*. These standards, while providing operational guidance on sustainability assurance and stakeholder engagement, address issues affecting the business' governance and the organizational strategy ²⁷. The AA1000 standards can be used in two ways: as tools to verify the quality of specialized accountability standards and as stand-alone systems for processing and communicating social and ethical accountability performances, as GRI guidelines do.

²⁶ For further information check www.globalreporting.org

²⁷ www.accountability.org

2.6.3.2. BALANCED SCORECARD

Another useful instrument to measure and monitor the sustainable performance of a company is the balanced scorecard (Perrini, 2002). Proposed by Kaplan and Norton in 1992, the balanced scorecard is a multi-dimensional internal measurement and management instrument which evaluates corporate performance through a set of measures built around four fields of intervention or “perspectives”: an economic perspective; a customer perspective; one of internal business processes and a “learning and growth” perspective. This method allows a company to develop strategies, objectives and the related indicators, while furnishing a balanced picture of the corporate dynamics and of the development of corporate competences and intangible assets. The balanced scorecard is therefore important to evaluate sustainability since it can be thought to include financial, social and environmental indicators in an organic way so that the real performance of an organization could be closely evaluated (Fiorani et al., 2012).

2.6.3.3. KEY PERFORMANCE INDICATORS

Another useful instrument to assess a sustainable-oriented CSR commitment is represented by the overall set of Key Performance Indicators (KPI) which can be adopted. These indicators can be either qualitative or quantitative and can be identified, starting from the internal guidelines of CSR, from the suggestions coming from stakeholders or from rating agencies or international standards (Perrini et al., 2006). An enterprise can create a codified system of KPI which can be divided in many categories, on the basis of different groups of stakeholders. Therefore, there could be some environmental indicators (about energy and material consumption or atmospheric and water emissions), some other which instead monitor the economic performances (customer satisfaction, shareholders’ remuneration, company’s rating or relations with banks or financial institutions) and others which pay attention to some internal dynamics, such as the level of activities which contribute to the creation of internal intangible resources such as human, relational or intellectual capital (turnover, training, equal opportunity, incentive systems, employee benefits). Nevertheless, it is also important that these indicators would be measured, monitored and gathered together in a systematic way, with the use, for example, of informatics instruments (Perrini et al., 2006).

2.6.3.4. ISO 26000

ISO 26000 Standard represents another instrument which can be used to show the CSR commitment of an enterprise. This standard was launched in 2010 by the *International Standard Organization*, following five years of negotiations between many different stakeholders across the world. Representatives from government, NGOs' leaders, members of industry, consumer groups and labor organizations were involved in its development, which means that it represents an outcome, result of an international consensus. ISO 26000 provides a specific guidance on social responsibility, showing how businesses and organizations can operate in a socially responsible way²⁸. Its main objective is to “promote a global common understanding of CSR among organizations, both in the private and public sector” (Fiorani et al., 2012). The specificity of ISO 26000:2010 is that it provides more guidelines rather than specific requirements, so it cannot be certified and verified by third-parties. The standard, however, is very helpful because: it clarifies what CSR is and what are the best actions and practices relating to CSR globally; which are the modalities through which is possible to integrate, implement and promote CSR behaviors within an organization; it helps to better identify and engage the relevant stakeholders and maximize the organization's contribution to sustainable development (Fiorani et al. 2012). Furthermore, ISO 26000 makes recommendations on how to recognize those significant environmental aspects and minimize the environmental impact of organization's activities, addressing topics such as the climate adaptation and respect of biodiversity.

²⁸ <http://www.iso.org/iso/home/standards/iso26000.htm>

2.6.4. REPUTATION MANAGEMENT INSTRUMENTS

In conclusion, within the category of CSR instruments, it's also important to underline the role of those initiatives aimed at connecting the CSR with logics of marketing and communication. According to the distinction proposed by Kotler and Lee (2005), there exist different marketing procedures which can be ascribable to CSR reasons and implemented in order to disclose the corporate CSR orientation. Most of them are mainly motivated by the expectation of gaining intangible benefits (related to the corporate image) rather than by direct economic benefits. Within them, it is possible to include:

- *CAUSE PROMOTIONS*, namely the promotion of social causes done by enterprises in partnership with non-profit organizations and public institutions, such as projects concerning transport safety, projects of environmental education or initiatives concerning the health protection;
- *CORPORATE SOCIAL MARKETING*, namely the sponsorships for social initiatives in which a corporation provides a non-profit organization with financial, organizational or managerial resources and competencies for the realization of fundraising initiatives or for the sensitization to some social issues;
- *CAUSED RELATED MARKETING*, namely those marketing initiatives which envisage the establishment of a strategic cooperative partnership between a for-profit business and a non-profit organization, characterized by a charity donation that the enterprise would undertake for a good social cause, when a consumer purchases a specific product. A CRM campaign can generate benefits both for non-profit organizations (e.g. an increased ability to promote social causes thanks to the greater financial resources of business or the increased ability to reach possible supporters) and for-profit business in terms of positive public relations, improved corporate reputation, better customers relations, additional marketing opportunities, further increased profits and a strengthen of *corporate identity*.

Table 2. A summary list of the main CSR instruments adopted worldwide

Economic dimension	Social dimension	Environmental dimension	Sustainability dimension
*Operating budget	*Social Audit	*Environmental report	*Global Reporting Initiative Guidelines (GRI4)
*Indicators of profitability	*Social Report	*Environmental accounting	*Balanced Scorecard
*Current ratio	*Socio – efficiency indicators	*Eco-efficiency indicators	*Q-RES project
*Periodic performance indicators (marketing; production; R&D)	*Ethical Code *(AA1000)	*Environmental Management Systems (EMAS & ISO 14001)	*SIGMA Project
*Value of economic capital	*OHSAS 18001	*Life Cycle Analysis	*Key Performance Indicators
*Shareholder Value	*SA 8000	*Environmental Labels (EU <i>Ecolabel</i>)	*ISO 26000
	*Ethical Indexes (Domini 400; Dow Jones; FTSE4 Good Index)	*ISO 9000	
		Reputational dimension	
	*Ethical & Social Rating	*Cause promotions	
		*Corporate Social Marketing	
		*Caused Related Marketing	

From the analysis of CSR instruments, it's possible to conclude that an effective management of the polyhedric faces of CSR requires the imperative to operate with certain procedures and with consolidate instruments, because only in this way it's possible to properly assess the non-financial performances which make up the CSR idea. A CSR oriented management should therefore acknowledge the responsibility paradigm through the adoption of proper instruments and reporting and measurement tools.

2.7. THE STRATEGIC IMPLICATIONS OF CSR

After having analyzed the versatility of CSR concept, it's important to conclude with another critical issue concerning the fact whether firms can use CSR to achieve a sustainable competitive advantage, thus earning a greater rate of profit and better performing in comparison to firms that do not engage in those kind of behavior.

Since the early '90s, an increasing number of empirical researches have been carried out, aimed at studying the relationship between CSR behaviors and corporate economic and financial performances, but the multiple results have shown a substantial inconsistency, both for what concerns the existence and the direction of the correlation between the two constructs, and no consensus has emerged on whether CSR leads or not to superior performances.

Researchers have produced dozens of studies examining this empirical relation, ranging from simple correlation analysis to more sophisticated multivariate analysis and the results have appeared to be mixed, although some distinct trends showing a positive and significant relationship between CSR and financial performance exist (Molteni, 2004).

The little consistency in the several results may be a result deriving from some forms of inconsistency in defining both CSR and firm performance or caused by the existence of some fundamental variance in the samples analyzed (McWilliams and Siegel, 2006). In an econometric analysis evidence of bias might occur: omitted variables in the determinants of profitability, limited data (small samples, old periods), cross-sectional analysis invalid in the presence of significant firm heterogeneity (in terms of size or industry characteristics), problems of measurement of CSR or wide diversity measures used to assess financial performance (Cavaco and Crifo, 2010).

As stated above, there have been many researches aimed at exploring this correlation. In the section below some of the studies which have investigated this correlation have been shown. McWilliams and Siegel in their paper (2006) offer, in this respect, an important contribution, by classifying some of the most important researches conducted about this topic.

In his article of 1991, starting from the notion of Corporate Social Performance (CSP), Wood was one of the first who tried to clarify the nature of the relationship between this concept and firm's financial performance, finding as result a non-linear relationship (an inverted U relationship) between the two.

Russo and Fouts, in 1997, empirically tested the RBV theory previously elaborated by Hart, using firm-level data of environmental performance and accounting profitability, and they found that firms with higher levels of environmental performance had superior financial performance (McWilliams and Siegel 2006). Also the study of Waddock and Graves (1997) showed a positive relation between firm performances and CSR adoption (Molteni, 2004).

McWilliams and Siegel in 2000, while challenging the conventional regression model (commonly used to assess this relationship), noted that the regression equation was misspecified because it did not include two key variables, considered to be determinants of firm performance: the level of R&D and advertising expenditure. Then they concluded, that if R&D and advertising had been included in the model, CSR would not have constituted a determinant of superior firm performance (McWilliams and Siegel, 2006).

A further important research has been the study *Buried Treasure, Uncovering the Business Case for Corporate Sustainability*, developed in 2001 by the international consulting company *SustainAbility* with the patronage of the *United Nations Environment Program*, in which a matrix model, which crossed some traditional key success factors of business (cost reductions, increases in sales, containment of risks) with the so-called "sustainability factors", thus the set of actions related to CSR, was proposed. The model was able to explicate the multidimensional nature both of economic performances and of socio-environmental ones, providing this relation with several example of successful case-studies (Molteni 2004).

This matrix model was subsequently used in 2002 by another study, still promoted by *SustainAbility* and titled "*Developing Value: the Business Case for Sustainability in Emerging Markets*". The study, after having assessed 240 businesses in over 60 countries, found that good corporate governance practices and CSR actions could produce financial benefits even for developing and emerging markets, including cost savings, increased revenues, reduced business risks and improved access to capitals, particularly the foreign ones (Perrini et al., 2006).

The *meta-analysis*²⁹ conducted by Margolis and Walsh in 2003, which counted 127 studies devote to exploring the relationship between CSR and the Corporate Financial Performance of firms in the period 1972-2002, was also interesting, even if their results were *puzzling*: In spite of the fact that the majorities of included studies showed a significant positive relationship, conflicting results were reported, even in cases based on the same sample of firms (Margolis and Walsh, 2003).

Also Orlitzky et al., in the same year, conducted a *meta-analysis*, considering 52 studies and yielding a total sample size of 3,878 observation. Overall, they found a positive association between corporate social/environmental performance and corporate financial performance, asserting that in general, market forces “do not penalize companies that are high in CSR”, thus managers could afford to be socially responsible. The study concluded that the relation between the two dimensions had to be considered reciprocal rather than one-dimensional, because the two constructs influence each other through a *virtuous cycle* (Orlitzky et al., 2003).

An additional interesting research, aiming at investigating which combinations of CSR are most likely to improve firm performance, is the one submitted by Cavaco and Crifo (2010). In order to examine the impacts of clusters of CSR practices on firm performance, the authors proposed a theoretical model based on a rich data panel set of CSR and performance indicators for the biggest European listed firms during the period 2002-2007. This study showed that the nature of complementarity³⁰ or substitutability between the different CSR practices – broken down into environmental, social and business behaviors components – has significance in determining the nature of CSR-firm performance relationship. After having used the System GMM (Generalized Method of Moments) technique to estimate the impact of CSR practices on firm performance, then the authors tested the complementarity between the three dimensions, concluding with the statement that, CSR efforts should be simultaneously high on human resources and toward customers and suppliers, while instead CSR efforts, which would be simultaneously high on each pairs, will not lead to superior financial performances.

²⁹ A *meta-analysis* is a statistical method of combining the results of a number of different studies in order to provide a larger sample size for evaluation and to produce stronger conclusion that can be supplied by any single study

³⁰ According to the authors, two CSR tasks are complementary when the cost of effort in one CSR tasks decreases when another CSR tasks is implemented (Cavaco and Crifo, 2010)

A further positive connection between CSR and financial performance comes from the study of Marin et al. (2012), inside which it is shown that this relationship is stronger if a company follows a proactive strategy – thus anticipating future responsibilities and influencing stakeholders to perceive its CSR commitment as sincere – and if it has a large size, because able to generate a more positive stakeholder reactions than a small firm (Marin et al. 2012)

However, due to CSR multidimensionality, a long-term competitiveness of businesses cannot be measured only by index of profitability or economic earning, because it can also be influenced by several intangible factors. Traditionally, authors have considered financial measures, such as productivity or return on assets as the only good indicators of competitiveness (Orlitsky et al., 2011). Instead, this concept cannot be conceived as *one-dimensional* because it can be influenced by several internal and external business factors, such as the quality of internal human capital, the quality of external stakeholders' relations, confidence in customers or external business reputation.

Therefore, many empirical studies have also focused on the relationship between CSR and these intangible elements influencing competitiveness. Greening and Turban (2000) or Kotler and Lee (2005), for example, analyzed how the adoption of CSR practices could increase company's competitiveness in terms of capacity to attract a quality workforce, could improve the corporate climate or reduce some opportunistic behaviors, thus fostering a notable growth of human and intellectual internal capital. Another study of Stites and Michael (2011) concluded that, investments in CSR and the subsequent communication of these activities, being an important concern for manufacturing employees, might improve their attitudes (Orlitszky et al., 2011). Other researches, such as the one of Fonseca (2010), focused, instead, on how the external perception on CSR could positively affect the image of brands and firms, the propensity of consumers to buy brands or patronize retailers, thus increasing the financial performance (Marin et al., 2012).

In conclusion, notwithstanding all the difficulties to establish definitively the positive relationship between CSR and financial performance, it is possible to establish, in general, an empirical plausibility of this relationships. Even in the worst cases, a CSR-oriented attitude seems to be not harmful for a company which implement it. CSR activities, indeed, can contribute to the increase of companies' intangible asset of knowledge and trust, which in turn support that process of value creation and financial performances. Therefore CSR is not, as some claims, just a luxury implemented only by those sizable companies which have positive economic performances but, in a long-term competitive strategy, it can be able to generate both profits for every adopter company and create positive externalities for the society in which the business is inserted. Strategic leaders need therefore to legitimize CSR as an integral part of corporate identity, allowing managers the time and resources they need to manage the multidimensional issues of the subject, according to the specific characteristics of the enterprise. CSR represents the main driver of corporate sustainability and thus it should have an all-persuasive nature in the business structure: from values to principles, from organizational model to communication strategy, from planning to end of pipe reporting. Therefore, the more integrated CSR will be into company strategies, the more processes will be oriented towards the long run and the better the relationships with stakeholders will be.

Furthermore, a well-implemented strategy of CSR can bring another important benefit to an adopting company. The existence of CSR can, indeed, serve as a potential framework in which innovations in general (and in particular environmental-related innovations) can be identified and then exploited to the company's advantage. A strategic CSR approach can stimulate business' creativity, enabling enterprise to redesign products and processes along the entire value chain in a more sustainable and greener manner, thus producing more business opportunities and larger sustainable competitive advantages.

Particularly interesting is the connection between CSR and the so-called eco-innovations, i.e. those innovations with environmental benefits. The third chapter will deal in detail with this issue, and in conclusion it will explore this fundamental (and renewed) relationship.

CHAPTER III

CSR and Eco-Innovations : a renewed perspective

3.1. CORPORATE ENVIRONMENTAL RESPONSIBILITY

As stated in the previous chapter, one of the essential components of Corporate Social Responsibility is represented by the so-called Corporate Environmental Responsibility (CER), namely the whole responsibility that a company undertakes towards the natural environment around it.

In times of Climate Change, businesses are no longer able to conduct destructive practices in respect to external environment (e.g. discharge of hazardous wastes, production of polluting emissions or massive deforestation) without receiving a negative response from the public opinion and the civil society. Companies, especially those of large dimensions, are more and more exposed to the attention of the media and subject to NGOs' and customers' external judgments, and a disrespectful behavior towards the environment could be counter-productive and lead to damaging losses in market shares (i.e. diminishing profits) or declines of consumers' confidence. Therefore, in order to stay in the market, the importance of conducting sustainable and long-oriented business practices has become inevitable, and CER, as well as CSR, can no longer be ignored (Rexhepi et. al, 2013).

Until recently, an environmental-friendly attitude was considered by firms, no more than an ethical solicitation coming from minority sectors of society or even a threat to their short-term profitability. Therefore, the majority of them introduced environmental programs only if and when obliged by law, and the environmental strategies were mostly conceived as *reactive*, more aimed at complying with external requirements and minimizing the efforts for the reduction of negative impacts.

In this sense, enterprises implemented actions of *passive lobbying*, through which they principally tried to cause a delay of the approval of more stringent regulations, considered as negative, and when obliged to comply with a standard or with a norm, they usually invested in already existing *end-of-pipe* solutions, without spending significant amounts of money for research and innovation.

However, in the middle of the nineties, the rise of a renewed environmental awareness – supported by the parallel evolution of Corporate Social Responsibility – drew an incremental change in the behaviors of enterprises, which started to perceive environmental obligations not only as expensive burdens, but also as strategic business levers, as powerful economic factors able to affect their sustainable prosperity while inducing deep transformations in their internal organization and in the production processes (Azzone et al., 1996). The success of environmentalism was also supported by the growing empirical researches which, while shading the light on the linkage between environmental and financial performances, confirmed that it would be possible for those environmental-friendly companies to achieve a higher competitive positioning over the mid to long term (Asongu, 2007). Therefore, the *reactive* strategies, previously dominant, were replaced by a wide range of *anticipative* actions, based on environmental innovations and characterized by a greater stakeholder engagement and a reinforcement of the whole *environmental know-how*. In this respect, the agendas of businesses became intensively populated by such new concepts as the *ecological footprint*, *eco-efficiency*, *greening the supply chain*, and *dematerialization* and, in this context, CER progressively became one of the main dimension of businesses' contingent nature.

However, the passage from a *reactive* to a *proactive* CER, has not been homogeneous across sectors and countries, due to the existence of several exogenous and endogenous elements, such as: disparate geopolitical configurations, several national legislations and differences among the characteristics of market's sectors, such as the presence of *green competencies* inside firms or their propensity to innovate.

In general, the diffusion of this renewed pro-environmental attitude was stimulated by some internal and external forces. Among them, it's possible to remind: an increasing demand for green and eco-friendly products, coming from different new consumers segments; the evolution of national pro-environment legislations, which became stricter and more detailed;

a growing awareness diffused at the international level for what concerned the issue of sustainable development, enhanced by several multi-lateral conferences and initiatives (e.g. Earth Summit of Rio in 1992 or the Kyoto Protocol in 1997); changes in the price system and the growing costs related to the use of environmental resources; the emergence of a new culture of responsibility inside the enterprises (i.e. CSR) and the enhancement of some intangible resources as human capital and internal know-how (Azzone et al., 1996).

In this respect, an increasing number of companies has started to pay more and more attention to environmental performances related to their production processes, to their upstream performances related to the use of raw materials and resources input, and to the quality of their final outputs offered in the market, making environmentalism a part of the overall corporate processes of doing business and linking “green” objectives with profit goals (Dechant et al., 1994).

All this has happened because, *“today, more than ever before, the air we breathe and the water we drink are not strictly environmental issues: they’re business issues. Business and Environment are inextricably linked, and successful companies know it.”* (Asongu, 2007).

Nevertheless, nowadays, these unquestionable improvements, obtained by businesses in respect to their environmental dimension, are no longer sufficient, because despite the (highly advertised) commitments, these achievements have been globally too small, as compared to the scale, complexity and severity of transnational environmental challenges. Global problems, such as climate change, instead, require huge efforts and coordinated actions at international level, and the managers of business organizations are relatively powerless in the face of the powerful market forces which drive the increasing demand of the world’s natural resources. In this respect, as stated by Toms (2013), *“the social and environmental reform of corporations is unlikely the only solution to the actual crisis”*.

Therefore, even if CER, and more broadly CSR, are strongly implicated in this “changed world”, they’re not the only desirable solutions. Instead, the top priority, according to several scientific studies, seem to be the massive development (with the subsequent diffusion) of new sustainable green technologies that, in the near future, will manage to slow down ultimate climate damages and allow a moving away from the dangerous *business as usual* scenario.

For this reason, it's necessary to address some questions: how is it possible for businesses to efficiently cope with Climate Change issue and decouple economic growth from environmental protection? What are the most effective eco-innovative instruments which can be adopted to mitigate the damaging impacts while guaranteeing a sustainable prosperity? Through which channels could their adoption be incentivized? Which will be the role of CSR and CER in the *Green Economy* context? The present chapter will try to deal with these issues and it will in particular offer a focus on the growing role that eco-innovations could play to trigger new perspectives for economic growth and thus coping with the environmental crisis.

3.2. THE TRANSITION TOWARDS GREEN ECONOMY

As already stated, climate change is the most pressing challenge of our time and is considered “*one of the most significant market failures ever seen*”, as stated in the Stern Review of 2006. Burning fossil fuels and land use changes are within the primary causes of the rapid increase in CO₂ levels in the atmosphere since pre-industrial times, and there's international scientific consensus that “we” must stay “below 2°C of global warming in order to avoid serious consequences for people, the environment and our economies” (IPCC, 2014). The magnitude of the “climate challenge” is evident and its effects are already occurring across the globe. Therefore, in order to avoid dangerous risky transformations, global greenhouse gas emissions would need to be cut by over a third in 2030, compared to a *business as usual* scenario (IPCC, 2014).

However, in the next decades, further challenges related to the changing climate will seriously threaten the “mantra” of infinite economic growth and will even limit the ability of global population to pursue lifestyles and consumption patterns, similar to those that exist today in developed countries. Therefore, how to cope with Global Warming is becoming a top priority both for governments and international institutions, but also for global and national enterprises (Stern Review, 2006).

These and many other actors are already seeking innovative and sustainable ways of promoting economic activities, sustaining jobs and competitiveness while tackling

global environmental challenges, but, until now, the whole efforts of *greening the businesses*, have not been sufficient³¹ (Technopolis, 2012).

Over recent years, within the multiple solutions proposed to face this crisis, the possibility of a broader transition towards a more sustainable and renewed “green capitalism” has also begun to be discussed (Klein 2014). Therefore, in this respect, the paradigm of the so-called *Green or Low-carbon Economy*, has started to be included in the national and international debates on the economic crisis and, by now, there is a growing demand for a greener and sustainable model of long-standing growth, considered as “the only way to secure sustainable economic prosperity for all” (OECD, 2011). In this context, an increasing number of voices is calling for a rapid action, taken-up by governments and multi-lateral institutions, which would pave the way for this transformation, because, as stated in the Stern Review (2006) “*there’s still time to avoid the worst impact of climate change if strong collective action starts now, keeping in mind that the benefits of a strong, early action on climate change will outweigh the costs*”.

This new model, supported by the consensus of international scientific community, can be theoretically defined as “*a long-term transition of economic and industrial structures, as well as a method of capturing short-term opportunities, in terms of reforming those government policies that could be considered inefficient or harmful to the environment*” (Technopolis, 2012) and it is based on a central dichotomy defined of “three high and three low”, i.e. high performances, high efficiency, high yields, low carbon use, low energy consumption and low emissions. The main challenge, which this transitional model aims to resolve, is to “achieve a decoupling of economic growth and environmental pressure”, allowing thus the transition from the current resource-intensive economic system towards a future low-carbon economy (OECD, 2011).

Notwithstanding, the achievement of this huge objective is not easy as it seems, because the operation of modern global economies has been primarily structured upon the so-called “fossil fuels’ paradigm”, and moving away from this would require huge financial efforts and a strong political willingness worldwide.

³¹In order to tackle the problem, in 1992 the UN Framework Convention on Climate Change (UNFCCC) was negotiated, whose objective was to “stabilize greenhouse gas concentrations in the atmosphere and prevent dangerous interferences with the climate system”. However, the results were not positively significant and the GHG emission have continued to raise.

This “green transformation” is, therefore, a long and massive transition process, as there are many structural, political, technological and cultural obstacles that must be overcome, and it requires strong and determined efforts to incentivize the overall transformation of energy, industry, agriculture and forestry systems, which, in turn, would reverse the rise in greenhouse gas emissions and would simplify the achievement of a net zero emissions economy in the second half of the century.

In this respect, what is mostly indicated as an urgency is the great development (and subsequent deployment) of those technological innovations which could alleviate the negative environmental impacts of economic and production activities. This kind of innovations belongs to the macro-category of the so-called Eco-Innovations (hereinafter EIs), thus all those innovative methods and solutions deemed to bring consistent and significant environmental benefits such as reduced material use per unit of output, reduced energy use, reduced soil, water, noise or air pollution and improvements in the recycling of products (Le Bas and Poussing, 2013).

Nevertheless, a sufficient and cost-efficient diffusion of EIs, could be achieved only with a pro-active involvement of those innovative business companies which have already made strategic investments in CER or CSR programs and which are implementing important actions of mitigation such as scaling-up investments in *low carbon technologies* or large-scale and cross-sectoral partnerships to accelerate their implementation. However, it is essential that also the wide range of Small and Medium Enterprises (SME), which in some countries (e.g. Italy) represent the majority of national productive structure, play an active role in guiding the transition towards green economy, by adopting some eco-friendly innovative methods of production and spreading their knowledge to local stakeholders. In this phase of green renewal, SME will have, of course, to be economically helped and strongly incentivized both through adequate national policies and through the assistance of bigger companies which own enhanced skills and competencies about EI. However, what generally emerges is that all enterprises need to adjust their own development strategy according to the change of external environment, bearing all the new related responsibilities. A strong leadership on business actions for climate change *mitigation* – channeled through collaborative and cooperative efforts – is therefore essential, and the proposed eco-innovative solutions will need to be as big as the size of challenges the future context is going to deal with (OECD, 2011).

3.3. THE ROLE OF ECO-INNOVATIONS

Since the Earth Summit held in Rio in 1992, it was clear that the achievement of a long-term sustainability, tightly related to a reduction of environmental burdens (e.g. greenhouse gases), would have required deep changes in the current *technological regime*³², and that innovations would have been a fundamental driver of economic and social progress. Nowadays, 25 years later, this fact is undeniable and since then, there have been significant technological achievements, which have enabled substantial environmental and economic improvements (OECD, 2011).

However, over the years the complexity of environmental and economic problems has grown considerably and, as already said, the pace of innovative improvements (mainly characterized by incremental *business as usual* innovations, e.g. simple cleaning end-of-pipe pollution technologies) has been too slow to respond to the growing need for decoupling, thus constituting a risk for future sustainable development. Therefore, to keep the costs of climate *mitigation* and *adaptation* “manageable”, today, more than even before, there’s a clear need for “radical step jumps” and radical innovative improvements which would be able to deeply modify the functioning of economies and enterprises (Technopolis, 2012). What is needed, using the words by Veugelers (2012), is a “*pervasive transformation of the whole energy-economic system, mobilizing polluters to switch to new low-emission systems and supporting the development and diffusion of new clean technologies through adequate policy instruments and incentives to stimulate the demand side*”.

Before proceeding with the analysis of the pivotal topic of this chapter, it’s important to keep in mind the fundamental theoretical distinction (firstly proposed by Schumpeter) among invention, innovation and diffusion.

An *invention* mainly consists in the implementation of a scientific knowledge which is potentially useful from an economic point of view; this should be implemented by someone who is interested in the scientific research. This concept mainly refers to scientific discovery, but the element may not be needed for innovation.

³² A *technological regime* is a concept that embraces the whole system of production, the scientific and engineering knowledge organization, the infrastructure and social patterns of technology use in which a firm operates.

An *innovation* is the introduction of a novelty in the economic realm, something which is being developed or adopted and which may be new to the world or new to the company. The overwhelming majority of innovations are not based on discovery but are the outcome of applied R&D informed by theoretical knowledge and engineering experience. Therefore, an innovation is something which can be defined as a pure economic act, consisting in a new way of acting directly in the economic system (Antonelli, 1999) and, in an economic perspective, an invention becomes an innovation when the improved product or process is first introduced in the market. Then, there is also a third phase, corresponding to the diffusion of the innovation itself, a time span (usually measured in 20 years) during which the innovation spreads within a social system (Antonelli, 1999).

Innovation, according to the Oslo-Manual of the OECD (2005) is defined as “*the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relation*” (Kesidou et al., 2012). In particular, a *process innovation* occurs when a given amount of output can be produced with less input, while a *product innovation* requires improvements to existing goods (or services) or the development of new ones. These two categories are usually defined as *technological innovations*.

Instead, an *organizational innovation* – which includes new forms of internal management and organizational methods – and a *marketing innovation* – concerning the implementation of a new marketing conception with significant changes in the product design, in its packaging – belong to the so-called *non-technological innovations* domain (Le Bas and Poussing, 2015).

Notwithstanding, the general definition proposed by OECD (with its four sub-categories) is neutral concerning the content of progress and the direction of future societal development. Therefore, when dealing with issues of sustainable development, green growth or low-carbon economy, it’s important to take into account the distinction between environmental and non-environmental innovations, thus adding *environmental attributes* to the traditional idea of innovation (Rennings, 2000).

If countries want to move towards a more ecological and prosperous society, and firms wish to keep their competitive position in the future framework of *Green Economy*, it's thereby important to promote (and then implement) those kinds of innovations which could help to reach sustainability targets, open up new ways of addressing current and future environmental problems, while giving a more concrete idea about the direction of sustainable development. This specific category of innovation is called environmental innovation or, shortly, eco-innovation.

EI is a relatively recent concept, emerged with the flourishing environmentalism of 90's. One of the first appearances of this idea was inside an article written by Peter James in 1997, in which EI was defined as "*a new product and process which provide customer and business value but significantly decrease environmental impact*" (Kemp, 2010).

However, the absence of a common understanding and the complexity of the issue, have led, over the years, different institutions and authors to promote their own definitions.

The Measuring Eco-Innovation Project (MEI) of 2007, for example, funded by the European Commission, defined eco-innovation as "*the production, assimilation or exploitation of a product, production process, service or management method that is novel to the organization and which results, in a reduction of environmental risk, pollution and other negative impacts of resources use, compared to relevant alternatives*" (Arundel and Kemp, 2009).

The European Commission's Eco-innovation Action Plan, instead stressed that an eco-innovation could be considered as "*any form of innovation resulting in or aiming at significant and demonstrable progress towards the goal of sustainable development, through reducing impacts on the environment, enhancing resilience to environmental pressures, or achieving a more efficient and responsible use of natural resources*" (Technopolis, 2012).

Also interesting is the definition proposed by the Community Innovation Survey ³³ of 2008 which affirms that eco-innovation is "*a new or significantly improved product (good or service), process, organizational method or marketing method that create environmental benefits compared to alternatives. These benefits can be the primary objective of the innovation or the result of other innovation objectives and can occur during the production of a good, or during the after sales use by the end user*".

³³ <http://ec.europa.eu/eurostat/web/microdata/community-innovation-survey>

Finally, the broader explanation provided by the OECD is also relevant: EI is considered as *“an innovation that reflects the concept’s explicit emphasis on a reduction of environmental impact, no matter whether or not that effect is intended. This is not limited to innovation in products, processes, marketing or organizational methods, but it also includes innovation in social and institutional structures”* (OECD, 2011).

However, despite a common definition does not exist, from a firm perspective it can be stated, in general, that an environmental innovation is something able to generate concrete and tangible benefits towards the natural environment, helping to remedy the external environmental risks related to business activities, diminishing pollution and energy use, increasing internal energy efficiency and thus reducing the compliance’s costs for the enterprise itself.

The distinguishing characteristic between an EI and a generic innovation is that the technological change induced by an EI is aimed both at improving environmental quality and at decreasing environmental pressures, but also at reducing the costs of meeting environmental targets for the overall society. One of the peculiarity of an eco-innovation is that it places a significant emphasis on the reduction of an environmental impact (whether such effect is intended or not) while going beyond conventional organizational boundaries of the innovators, thus *“entering in the broader societal context through changes in social norms, cultural values and institutional structures”* (OECD, 2009).

Therefore, in a context of global environmental challenges (intrinsically interconnected with the economic downturn and, more generally, with the crisis of western capitalism) many governments and policy-makers are turning their attention to the promotion and diffusion of EIs, making it as part of a new growth strategy, able to reconcile economic and environmental priorities (Technopolis, 2012). In fact, the technological change induced by EIs, may potentially lead to a win-win situation in which a qualitative environment and economic growth can coexist.

EI can be considered as an overreaching concept, able to provide a broad orientation for the overall societal and economic changes needed to achieve sustainable development. A wider application of EIs by green business models, for example, can have important societal impacts, affecting job creation (*green jobs*) or improving the general quality of life (*green cities and urban mobility*).

Moreover, the adoption of EI can offer companies increasing economic advantages, by capturing economic value through new business opportunities and new revenue streams, and achieving consistent benefits such as cost savings or additional profits.

Therefore, all the political interest towards EIs can be, to a large extent, economically motivated, because they can help to deal with the tradeoff between economic growth and environmental protection and they're expected to produce a double dividend, i.e. limiting environmental burdens while contributing to the technological modernization of the economy (Ziegler and Rennings, 2004). EIs are seen as crucial elements to enable the transition towards a greener world, because in a resource-constrained world in which it's compulsory to abandon fossil fuels, they're instruments able to remedy the negative external environmental effects of economic activities, opening up new ways of addressing environmental problems.

As stated in the Stern Review (2006), *“the transition to a low-carbon and green economy will bring challenges for competitiveness, but also opportunities for growth’ arising out of eco-innovations, which will offset some of the high cost of mitigation”*

However, in reality, the economic effects of EI on growth and employment are not straightforward and positively unilateral, but can vary depending on the type of innovation itself (*process* or *product* innovations) and on the context in which it's implemented. Various empirical innovation studies have tried to shade the light of this linkage but there's still uncertainty on the nature of eco-innovative effects. The links between micro and macro effects are complex, with many cross-sectoral rebound effects and feedback loops: some cost-saving EIs can generate additional monetary wealth (increased incomes) that could then be used to buy further goods and services with negative environmental impacts, i.e. producing a net increase in the material use and overall associated second order environmental burdens; instead, other cost-increasing innovations are likely to contribute more to an absolute decoupling, but at the expense of lower economic growth. Some EIs, for example, can create jobs and wealth in some producing sectors (e.g. solar and wind power industry), but if the innovation itself increases the costs for final users (as it happens for the German consumers, which pay the higher prices for electricity generated from renewables) the environmental gains may be insufficient to compensate for the losses elsewhere (jobs and wealth).

3.3.1. CLASSIFICATION OF ECO-INNOVATIONS

Over the years, different attempts have been made to offer a classification system for EIs. Among the existing methods of categorization, it's could be useful to report some of the main representative typologies proposed by the literature on the issue.

1. The first method which is interesting to deal with, is a general one based on the distinction made inside the OECD Oslo Manual for the collection and interpretation of innovation data (2005). According to this classification, eco-innovations should be analyzed of innovations' target, mechanism and then impact.

→ The *innovation's target* refers to the basic focus of an EI which can be technological or non-technological in nature. In this sense there could be some *product* innovations, which involve both products and services, and *process* innovations, which refer to production methods and procedures. These two categories, as previously mentioned, belong to the macro-category of *technological innovations* because they tend to rely on techonological changes. Then, we can mention those *marketing* innovations, used for the promotion of products and other market-oriented strategies, the *organizational* innovations, related to the structure of management and the distribution of responsibilities, and the *institutional* innovations, which look at the broader societal arena beyond a single firm's control, such as cultural values and social norms. These three categories, instead, are considered as *non-technological innovations* and rely more on non-technological developments.

→ The innovation's *mechanisms* instead, relate to the methods by which the EI is introduced. OECD identifies four basic mechanisms, which are: *modification*, such as small or progressive product/processes adjustments; *re-design*, which refers to significant changes in the existing products, processes and organizational structures; *alternatives*, such as the introduction of goods and services that can satisfy the same needs and operate as substitutes of other products; and *creation*, which comprehends the design or the introduction of entirely new products, processes, procedures.

→ Finally, the innovation's *impact* refers to the innovative effect of EI on the environment, which principally depends on the mechanisms through which an innovation is introduced, as well as on more systemic and wider changes.

2. The second classification of EI is a detailed one, proposed by the Measuring Innovation Project of European Commission, which creates a categorization based upon the main purposes or final objectives of an innovation. The EI are thus differentiated (as reported in Box No.5) in *environmental technologies*, *organizational innovations* for environment, *product and service innovations* that create green benefits and a broad category of *green system innovations* (Arundel and Kemp, 2009).

However, this distinction, as underscored by Kemp (2010), presents some conceptual limits, even if, they're mainly thin methodological and definitional issues. Firstly, the inclusion of general "environmental technologies" in the list of EI is unfortunate and fails to make the classification itself clear. Indeed, an "environmental technology" should not be generally considered as an eco-innovation because "only innovations *in and of* environmental technology should be considered as eco-innovations" (Kemp, 2010). Moreover, another limitation of this classification, is the non-inclusion of the distinction between an eco-innovation *as an act* and an eco-innovation *as an outcome*. When a company uses a pollution control device for the first time (which is an established environmental technology) there is the implementation of an eco-innovation from the adopter's point of view, but this is not true from the manufacturer's perspective, because in his opinion an eco-innovation exists only when there is a significant change in the pollution control device or the creation of a completely new technology aimed at mitigating the negative effects.

3. Another interesting classification is the one reported inside the *OCED Environment Working Paper* of Haščič and Migotto (2015), based on the efforts of the Environment Directorate of the international organization, to develop patent-based indicators related to selected environmental technologies. Eco-innovations, as represented inside Box No. 6, are grouped into those "technological fields" that are more meaningful for policy-makers, and directed to achieve wider environmental policy objectives including, the reduction of human health impacts of environmental pollution, solution to water scarcity problem and mitigation of climate change.

BOX 5. MEI classification of eco-innovations

A. Environmental technologies

- Pollution control and waste water treatment technologies
- Cleaning technologies treating pollution released into the environment
- Cleaner process technologies such as new and less polluting manufacturing processes and/or more resource efficient processes
- Waste management equipment, water supply and noise control
- Environmental monitoring and instrumentation
- Green energy technologies (renewable energy)

B. Organizational innovations

- Pollution prevention schemes
- Environmental management and auditing schemes to deal with issues of material use, energy water and wastes (EMAS and ISO 14001)
- Chain management: cooperation between companies so to close material loops and to avoid environmental damages across the value chain

C. Product and service innovations

- New or improved products (goods), including eco-houses and buildings
- Green financial products, such as eco-lease or climate mortgages
- Environmental services, which are less polluting and resource intensive (car sharing, environmental consulting)

D. Green system innovations

- Alternative systems of production and consumption that are environmentally better than existing systems (biological agriculture)

Source: Kemp, 2010

BOX 6. Eco-innovations' classification according to "Patent search strategies"

1. Environmental Management

- * Air pollution abatement (from stationary and mobile sources)
- * Water pollution abatement (water and wastewater treatment)
- * Waste management (solid waste collection, recycling, re-use, incineration and energy recovery, land-filling)
- * Soil remediation and Environmental monitoring

2. Water-related Adaptation Technologies

- * Demand-side technologies (indoor or irrigation *water conservation*)
- * Supply-side technologies (underground, surface or rainwater *water collection*)

3. Biodiversity Protection and Ecosystem Health

4. Climate Change Mitigation Technologies related to Energy

- * Renewable energy generation (wind, solar, geothermal, hydro, maritime *energy*)
- * Energy generation from fuels of non-fossil origin (biofuels, fuel from wastes)
- * Combustion technologies with mitigation potential, for improved input-output efficiency (combined heat and power, combined cycles, biomass)
- * Nuclear energy (fusion/fission reactors)
- * Technologies for an efficient electrical power generation, transmission distribution
- * Enabling technologies in energy sector (energy storage, hydrogen technologies)

5. Capture, Storage, Sequestration of Greenhouse Gases

- * CO₂ Capture or Storage

6. Climate Change Mitigation Technologies related to Transportation

- * Road and Rail transport (conventional, hybrid, electric *vehicles*)
- * Air and Maritime transport

7. Climate Change Mitigation Technologies related to Buildings

- * Energy efficiency of buildings
- * Integration of renewable energy sources
- * Improvements in the thermal performances of buildings

Source: Hašič and Migotto, 2015

4. A further categorization, again offered by OECD, classifies EIs from a wider point of view (OECD, 2011) and considers the macro-effects that their implementation could have in inducing a long-term green transformation of the techno-societal systems. The starting point of this classification lies in reasoning expressed before, regarding the inadequacy of the present pace of eco-technological development and the urgent need for far-reaching changes in the existing technological regime (Technopolis, 2012). In this respect, there are four kinds of eco-innovations: *incremental*, *disruptive*, *radical*, *systemic*. In the figure below, the categorization provided by OECD is graphically represented. Although drawing boundaries between different levels of eco-innovative activities is not easy, the radical and systemic innovations include those on the right-hand side, while incremental and disruptive concern those on the left side.

Figure 11. Incremental and systemic eco-innovations



Source: OECD, 2011

- INCREMENTAL INNOVATIONS

These are the dominant forms of EIs adopted by industries and they include all those solutions aimed at guaranteeing a cleaner production method (pollution control technologies) and aimed at raising the efficiency of resource and energy use. Their implementation entails a modification (or an improvement) of the existing technologies already available for the enterprises, without fundamentally changing the underlying core technologies and solutions.

- *DISRUPTIVE INNOVATIONS*

The *disruptive* innovations are those innovative changes which modify how things are done or specific technological functions which can be carried out. Examples include the passage from conventional to LED lamps. Even for this category, the modified behavior does not involve any change in the underlying technological regime.

- *RADICAL INNOVATIONS*

The category of *radical* innovations greatly differentiates from the previous two because, on the contrary, they could involve a shift in the technological regime of an economic system, leading to important changes. Radical innovations imply a technological discontinuity based on a break with existing competencies and technologies, and they can involve a complex reconfiguration of product-service systems and even the generation of radical, breakthrough technologies (Kemp and Pontoglio, 2011).

- *SYSTEMIC INNOVATIONS*

Systemic innovations are defined as complex, advanced EI, the result of a sophisticated combination of the three different types of innovations (incremental, disruptive and radical). This fourth category (even if not so different from the *radical* one) could induce far-reaching changes in the techno-societal system (“how society functions” and “how its needs are met”) by influencing several branches of the economy, including the behavior of end-users consumers. These systemic innovations may have their origin in technological advances, but they’re also related with wider transformations, replacements or establishments of complementary infrastructures, associated with social and cultural values, beyond the boundaries of one company (OECD, 2009). Therefore, one of the imperatives for their successful implementation is that both suppliers and consumers would embrace social and cultural changes, adopting new mindsets and responsible behaviors. *Systemic* innovations can generate wide and continuous impacts in the long term as they “involve substantive risky investments, conflicts between emergent and incumbent actors, reconfiguring traditional sectoral and policy boundaries and a range of technological and non-

technological changes in organizational and institutional arrangements” (Technopolis, 2012). Such innovations are highly complex, and their adoption is considered to play a pivotal role for future economies, as they may help the society exit from current technological regime still anchored to polluting fossil fuels and to natural resource depletion.

BOX 7. Example of *systemic* innovation: urban mass-transit system

One explanatory example of *systemic* innovation concerns the diffusion of a new urban mass-transit system. It’s well known the need to radically modify the conception in which modern urban transportation is designed: the levels of smog registered in urban centers every day are reaching intolerable values and citizens are more and more exposed to serious risks for their health.

However, no single innovative solution (both political or technical) could effectively solve this issue: the introduction of electric cars, for example, is useless if it’s not favored by adequate investments in supportive infrastructures.

Therefore, what would be needed to better solve a modern problem as the urban pollution, is the introduction of a *systemic* complex eco-innovation, which could trigger substantial improvements and significant solutions aimed at deeply re-configuring the whole transport system.

Indeed, a new urban (and less polluting) transport system should involve a combination of innovative changes with regard to:

- Nature of circulating vehicles, with clean improvements deriving from initiatives promoted by transport industry, in order to increase the overall energy efficiency of cars, such as more efficient fuel injection technologies or better power management systems;
- Innovative modifications of “control and management” systems, facilitated by new ICTs, such as remote sensing, sensor systems and designed by high-tech facilities and engineers;
- Renewed organizational practices, like networked collaborations between car industry and policy-makers or new methods of interactions in line with principles of *Sharing Economy*;
- Transformations in the design of urban infrastructure with the introduction of several pedestrian zones, bicycle paths and restricted traffic areas;
- Innovative political decisions, guided by the courage and by foresight of local authorities, which would provide, for example, incentives for bike users or the promotion of alternative modes of transport such as car and bicycle sharing.

Source: Technopolis Group, 2012

In conclusion to this paragraph, it's possible to state that this last categorization must be always kept in mind when dealing with this salient topic. The technological advancements achieved so far in the environmental domain, offer a large variety of eco-innovative solutions ranging from pollution control techniques to cleaner production methods, from eco-efficiency measures to eco-design and green products production.

Over the recent years, all these tools have helped to generate environmental improvements, leading to a relative decoupling of economic growth from environmental pressure and to a renewed, collective and individual, environmental awareness (OECD, 2009). However, as already stated, the scientific evidence is warning that the achievements in this domain have been too scanty if compared to the urgent environmental challenges, and that the impact of these solutions has been of a local and incremental nature, showing the existence of an important issue of scale (Technopolis, 2012).

Therefore, in order to enable an absolute (and sustainable) “decoupling”, what is more needed is the implementation of those radical/systemic innovations that would imply significant changes at all levels of societies (Arundel and Kemp, 2009).

By now and in most cases, the proposed solutions have been introduced within the existing production process or business systems (i.e. incremental or disruptive) because easy to manage and less costly to implement, and they have not involved a wider modification of the existing technological regime. For example, renewable energies, even if deemed to be as the fundamental future energy sources capable of replacing polluting fossil fuels, are not enough incentivized and developed across the globe (Klein, 2014). Over the recent years, huge steps in R&D have been taken, but their introduction has been too limited to specific sectors and not conceived in a systematic manner on a long-term perspective. Moreover, in many cases political barriers have prevented further advancements in their adoption (e.g. the case of *Green Certificates* in Italy or the example of *Feed-in-Tariff Program* in Canada). Therefore, if “we” want to achieve the ambitious target of a low carbon-green society and thus limiting the negative damages of climate change, it's time to study and implement those *radical* and *systemic* EIs able to deeply affect and modify the *business as usual* path of humankind development.

3.3.2. MEASURING ECO-INNOVATION

After having introduced a general overview of eco-innovations and offered some insights about their definitions and the different ways of classifying them, a short paragraph should be dedicated to the issue of their measurement. The first question to be addressed is “why should eco-innovation be measured?”.

In the working paper of 2009, Arundel and Kemp tried to deal with this question, underscoring the several benefits resulting from this activity. The key motivation for measuring environmental innovations is to identify their potential to reduce the negative environmental impacts of economic activities at lower cost. Measuring EI is important because their measurement can help policy-makers to understand and benchmark their overall trend, identifying the barriers to their implementation, and thus enabling the design of effective policies and framework legislative conditions which can spur future eco-innovative behaviors. Indeed, in order to identify the economic opportunities for leveraging EI, to make them into a large-scale commercial success and to disseminate their practical use, both industry and policy-makers need to acquire a better understanding of the social, technical and political factors that enable or obstruct their adoption, as well of several benefits deriving from their adoption. Therefore, providing adequate measures concerning the “state of the art” is crucial for the design of specific eco-innovative actions which would best fit with the national economic and technological framework. Moreover, specific and accurate data on eco-innovations could be useful to raise the awareness among stakeholders (also among consumers) and to encourage companies to increase their eco-innovations’ efforts (Arundel and Kemp 2009).

A second critical issue for researchers is “how to measure eco-friendly innovations?”. Many criteria and indicators may be used to evaluate the environmental impact of an innovation (greenhouse gases emissions, air pollution, energy use, water pollution etc.) but, in general, the global impacts of an innovation are very difficult to assess.

In this regard, it could be useful to remind the classification, submitted by the MEI Project. It is split into four different categories – outlined below – which can be used in order to evaluate eco-innovative behaviors (Kemp, 2010).

1. INPUT MEASURES

This first category primarily includes the expenditure in Research and Development (R&D), and some general innovation expenditures (including the amounts spent for the development of new software or those spent for design). R&D statistics are widely used in innovation research because they capture formal R&D (usually within formal laboratories) and they are easy to collect. However, at the same time, there are also some limitations related to their usage, such as: underestimating R&D expenditures of smaller firms (which are often done on a more informal basis); not covering non-technological innovations (organizational and marketing) and not capturing the R&D efforts made by service sector (Arundel and Kemp, 2009). Moreover, data for “environmental” R&D are extremely limited in scope and often not available because the only consistent data across OCED countries refer to budget provision instead of actual expenditures (Kemp and Pontoglio, 2011). Moreover, these data are usually available at an aggregate level and they cannot be broken down by technology group, and they are generally incomplete if compared to private R&D expenditures (Hašič and Migotto, 2015).

2. INTERMEDIATE OUTPUT MEASURES

Patents, scientific publications and citations belong to this second category of EI measures. In particular, patents are the most commonly used data to construct intermediate indicators for EIs’ measurement. A patent is *an exclusive right to exploit (make, use, sell, or import) an invention over a limited period of time (20 years from filing), within the country where the application is made*” (Arundel and Kemp, 2009). Patents are usually granted for those inventions which are new, inventive and could have industrial application, and even in the environmental domain, they are the most used indicators of the level of an innovative activity (Kemp, 2009). Patent data have a number of attractive properties compared to the alternatives, because they’re widely available, quantitative (hence easily amenable to statistical analysis), commensurable, output-oriented and capable of being disaggregated into specific technological fields (Hašič and Migotto, 2015). Nevertheless, patents are, in some cases, inadequate indicators to develop a comprehensive measure of EIs. This may be ascribed to three main reason: first, *not all innovations are patentable*, and this is true especially for those organizational, managerial and marketing innovations (i.e. non-technological innovations); secondly,

not all patentable inventions are patented, because inventors might pursue other informal strategies to protect technological inventions, such as industrial secrecy, lead time or complex technical specifications; thirdly, *patented inventions vary in quality and quantity*, due to the fact that not all patented inventions are immediately commercialized and adopted (patent applications are typically disclosed 18 months after the filing date) and thus their economic value can vary (Haščič and Migotto, 2015).

3. *DIRECT OUTPUT MEASURES*

The so-defined *direct output measures* are those data on sales of new products' sales (contained in specific databases with environmental information), coming from the direct number of innovations measured on market, or from those descriptions of individual innovations included in the announcements of trade and technical journals (Kemp, 2010). For these measures, some strengths exist (cheap data collection, measurement of actual innovations directly introduced in the market, timely indication and digitalization of information) but also some weaknesses. One of the major limitation is that bibliometric data are ambiguous indicators of market output, making it difficult to use citations as index of quality.

4. *INDIRECT IMPACT MEASURES*

Lastly, EI measures derived or inferred from aggregate data, principally monitoring the changes (improvements or declines) in resource eco-efficiency and productivity of a specific product or process, belong to the fourth category of *indirect impact measures*.

Nevertheless, in order to offer a complete answer to the question “how to measure eco-innovations?”, it could be interesting even to consider the different techniques which can be used to collect information about investments in EIs. The main instruments used to collect data on the EI activities of firms are generally the surveys, which are probably the best method to monitor EI and evaluate its drivers and outcomes (Arundel and Kemp, 2009). Surveys, due to the limitations of the previous measurements are an important source of information about the facilitating factors for EI and can be used, for example, to gather information on the economic effects of EI on sales, on production costs or employment.

Surveys are uniquely suited for assessing the link between a wide range of company's internal and external factors across industries and allow easily comparisons between firms and countries. However, the main shortcomings with such exercises are their cost, because a dedicated industrial survey which addresses environmental concerns on a regular basis would be prohibitively expensive. Moreover, the data included in the surveys are self-reported, and this element can lead to difficulties cross-country comparisons. Arundel and Kemp (2009) provide a tripartite classification of different surveys' techniques which can be used for assessing EI.

A. *LARGE-SCALE SURVEYS*

The first type of survey consists in official, large-scale "innovation" surveys, lead by international institutions or supra-national agencies, that could involve thousand of firms and which, due to the high response rates, can trace trends in innovation activities through time. An example is the *Community Innovation Survey* (thereafter CIS survey) launched for the first time in 1992 by the European Union in order to address, in a systematic manner, the innovation activities of enterprises. Since then, five CIS surveys have been carried out, with the aim of providing cross-country information on the innovativeness of sectors by type of enterprises and on the different types of innovations adopted. The CIS of 2008 was particularly relevant because it collected information related to the period 2006-2008 and for the first time, it offered large-scale data about environmental innovations. Before CIS 2008 there were no official statistics for corporate environmental innovations and researchers had to use data from single surveys in order to assess the scale of green technologies³⁴. Therefore, this survey (with its special module on eco-innovation) represented a watershed for eco-innovation measurement, because for the first time, it provided precious information about the nature and magnitude of EIs in European companies, including output measures and determinants (Kemp, 2010).

³⁴ Data from CIS 2008 will be used in the fourth chapter of this work, for the empirical analysis aiming at analyzing the link between CSR, EI adoption and increases in firm's profitability. From the following web-link it's possible to look at the questionnaire proposed to surveyed firms http://ec.europa.eu/eurostat/documents/203647/203701/CIS_Survey_form_2008.pdf/e06a4c11-7535-4003-8e00-143228e1b308

B. *SMALL-SCALE SURVEY*

The second category consists in smaller surveys, lead by academics or government agencies and usually focused on a limited region or set of sectors. These smaller surveys are commonly used because they focus on EI in far greater depth and give the possibility to ask about many aspects of EI such as drivers and motivations, barriers or economic impacts on costs. However, this kind of surveys shows some limitations such as low response rates, which reduce confidence in the accuracy of final results, and the low degree of harmonization between different individual or country specific surveys.

C. *PANEL SURVEYS*

Lastly, the third category which can be used for measuring EI is the one of panel surveys, which gather information from the same sample of firms over time (annual or more). This kind of investigation is useful because it can provide information about the size, the levels and the direction of innovating activities, identifying the trends and changes in innovative behavior over time (expenditures for innovations and trends of economic performances achieved with the new products, new services and improved processes). However, making these surveys is costly and imply the existence of a favorable attitude by firms to provide adequate and complete information over time.

In conclusion, it's possible to state that there is not a unique indicator or single survey technique to better measure and investigate EI but, when possible, it would be more useful to apply different methods, in order to see the "whole elephant", instead of just a single part of it (Arundel and Kemp, 2009). In this context, however, it's suggested to devote more efforts towards the use of direct outputs measures (through documentary and digital surveys) or intermediary output measures (i.e. patents), because able to better measure direct environmental innovation outputs rather than innovation inputs measures (e.g. R&D expenditures). In particular, among the various alternatives reviewed here, patent data are best suited for identifying specifically environmental innovations, due to the fact that patent classification systems are "technological" by nature, and allow for a rich characterization of relevant technologies, describing the engineering features of an invention and its application at a fine level of detail (Hašič and Migotto, 2015).

Instead, referring to surveys, it's important to include specific questions in questionnaires, which could be useful to get data on the economic effects of EI on sales, production costs and employment. Identifying the effects of EI on competitiveness is of primary importance to incentivize the design of right policies; these will encourage firms to further long-term green investments.

3.4. DETERMINANTS OF ECO-INNOVATIONS

Knowing which are the driving forces behind the adoption of EI is rule of thumb both for enterprises, which are directly involved in EI implementation (and which have to know how to correctly behave) and for decision-makers, who, on the contrary, have to plan and design an adequate regulatory framework which would encourage EI diffusion within the whole economic/social system. Therefore it is important to provide a complete overview of the main determinants driving these tools, considered crucial for climate protection.

EI are pulled and pushed by various drivers which can both have an *exogenous* or *endogenous* nature. Environmental innovations, indeed, may arise thanks to the action of external forces, like environmental policy intervention or external knowledge acquisition (Ghisetti et al., 2013) but also from internal factors, associated to internal organizational structure of firm and its management strategies, inside and outside its boundaries (Ziegler and Rennings, 2004). Several empirical studies, from the field of innovation and environmental economics, have already dealt with this issue showing this dual influence (Ziegler and Rennings, 2004; Mazzanti and Zoboli, 2006; Kesidou et al., 2012; Veugelers, 2012; Ghisetti and Quatraro, 2013; Horbach, 2014; Le Bas and Poussing, 2015). Therefore, it's possible to state that the adoption of innovative clean-up technologies is not straightforward motivated by single determinants, but often involves the complementarity action between different driving forces.

Among the set of elements which can jointly stimulate eco-innovation adoption, a widespread consensus in the literature has emerged with respect to some determinants, which can be grouped (as reported in Figure 12) into different clusters, named: *market-pull*, *technology-push*, *firm-specific factors*, *environmental policy regulations* and *endogenous elements* (Barbieri et al., 2015).

- *MARKET-PULL DEMAND*

The inducing influence of *market-pull* factors in shaping the *green* choices of firms, i.e. market-pull demand from consumers and final users for new eco and socially responsible products, or the expectations of increases in the turnover of the firm, has been confirmed by the empirical studies of Horbach (2008) and Wagner (2007). This has proved to be particularly true especially for some *product* or *marketing* innovations more connected to the packaging of final outputs or to the field of *sustainable eco-design*³⁵. However, the inducing action of societal pressures and market requirements has sometimes encouraged firms to undertake an investment in greener and cleaner operations, only for the initial phase of the “eco-innovation process”, thus not affecting the subsequent investment phase in the long run. In particular, Kesidou et al. (2012) empirically demonstrated this element, concluding that “*market conditions encourage firms to enter the environmental real, but the magnitude of their investments is more determined by other drivers, such as cost-savings and stricter regulations*”.

- *TECHNOLOGY PUSH*

The so-called *technology-push* is another important determinant of EI adoption (Horbach, 2008) characterized by the internal knowledge capital in environmental technologies accumulated by enterprises through R&D expenditures or by the knowledge absorbed outside external boundaries.

More specifically, a persistent investment in “environmental” R&D is considered a primary driver for most eco-innovation outputs, especially if the investment is conducted through networking relationships, agglomeration economies with other firms and research institutes (i.e. industrial symbiosis) or if the involved firms aim at internationalization strategies, opening to international markets and accessing to diverse resources (Mazzanti, 2006).

³⁵ *Sustainable eco-design* is a concept which looks at how designers may develop innovative solutions which take environmental-related issues into account during the innovation process. This kind of design looks at how designed products (or services) may be planned in order to be user-friendly. A modern contribution of the concept is *Socially Responsible Design* which is described as “CSR in action”, that is an external dimension of CSR (according to the distinction made in Chapter II) because “the understanding and implementation of a proper and sustainable design is necessary for companies to include CSR in the production of the products, processes, environments and services that create their image in the marketplace” (MacGregor et al., 2008)

An example is represented by the case of the German *Valuepark*, an industrial district created in 1998 thanks to the agreement between 13 firms belonging to the chemical-plastic sector. The greatest strength of the park is represented by a unique and shared R&D centre, which ensures a continuous exchange of information among the participating firms and guarantees a high efficiency of the results of researches. The final outcome of this enlarged alliance is a higher amount of environmental-friendly solutions and eco-innovative practices which can be consumed within the boundaries of the park itself or shared with external actors, according to a “win-win” perspective.

- *FIRM SPECIFIC FACTORS*

The cluster of drivers defined as “*firm specific factors*” includes all those elements, such as size, location, sector and age, which generally can influence the firm’s environmental innovativeness and also impact on other EI determinants. Several findings, for example, have confirmed that the investments in “environmental” R&D are significantly related to the size of firms and their belonging sector. Generally speaking, large firms are more likely to undertake environmental innovations if compared to their smaller counterparts, because their greater financial availability or because they have specific R&D departments within their boundaries. Moreover large firm’s higher trend to eco-innovate can be also driven by their higher public visibility and by the corresponding pressures they face from green public groups and the governments.

Instead, for what may concern the differences within productive sectors, the sectors which are at the forefront for environmental technological spending are usually, those with the highest levels of environmental impacts, such as energy production and chemicals. The perspective related to the inter-firms network relationships or firms’ clusters, as positive innovative drivers for innovation output, also need to be looked at. Horizontal economies of scale between firms and cooperative agreements with external partners, such as research centers and universities, might matter for EIs’ uptake (Barbieri et al., 2015). An evident successful example, is the Danish *Kalundborg Symbiosis*, the world’s first working industrial ecosystem and the most representative case of mutual interdependence among firms. Activated in 1998, the most important element which contributed to the development of this system, was the presence of a healthy cooperative communication among partners, facilitated by the small size of the community involved, and the established acquaintances among the managers.

Since its launch, Kalundborg District has made significant steps forward in the field of EI, and thanks to the presence of a joint cutting-edge research and innovation centre, several environmental benefits have been achieved, such as a reduced chemical and thermal pollution; a reduced resources use (water, coal, oil); a better use of energy resources; a convenient reuse of raw materials and an increasing amount of recycled output.

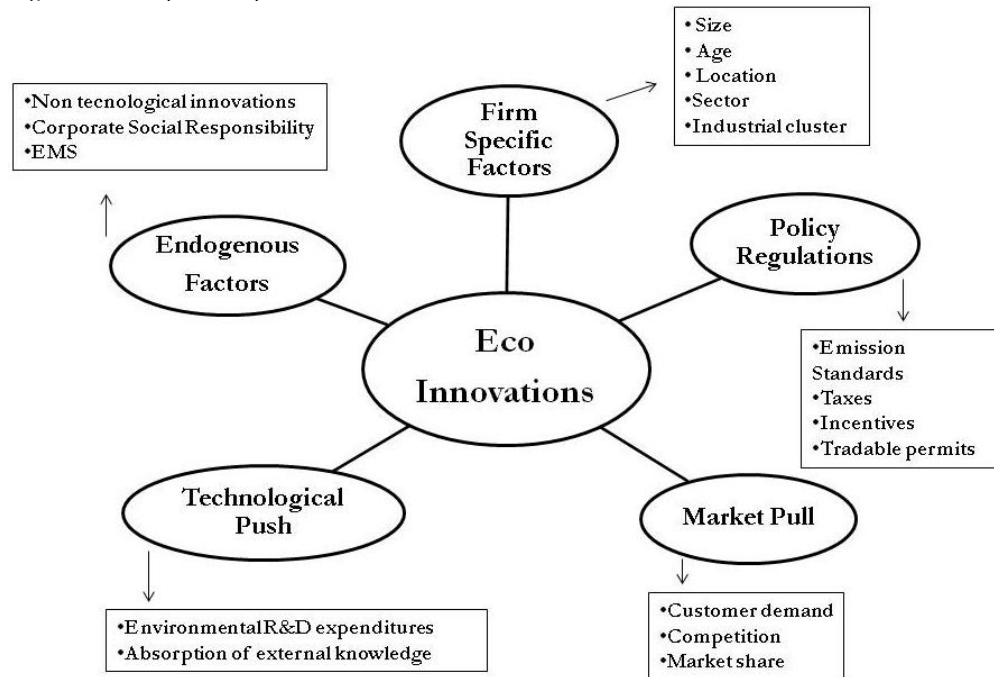
- *ENVIRONMENTAL POLICY PUSH/PULL EFFECT*

The innovativeness inducement of *environmental regulatory push/pull effect* is widely discussed in the literature, and the correlation between environmental regulations and technological changes has been empirically investigated. In general, the inducement effect of environmental policies rests upon the traditional Hicksian argument that “a change in the relative prices of factors of production is itself a spur to invention directed to economizing the use of the factor which has become relatively expensive” (Ghisetti and Quatraro, 2013). Indeed, since by favoring a change in the relative prices of production factors (through the use of market-based instruments such as taxes or subsidies) or by setting a new stricter environmental standard on polluting emissions, environmental policies can induce the adoption of eco-innovations in each phase of the “Schumpeterian innovation process”, from invention to adoption and then diffusion.

- *ENDOGENOUS ELEMENTS*

Finally, an increasing attention is also placed on the inducement mechanism of the so-called *endogenous factors*, thus those elements which concern the inner characteristics of business models, such as CSR or Environmental Management Systems. Pressures to improve the environmental performances can emerge within corporate boundaries rather than from external policy constraints and therefore it's important to consider their effect on the adoption of EI.

Figure 12. Graphical representation of the determinants of eco-innovations



Source: elaboration from the author

From a theoretical and academic perspective, the issue of EI is placed on the borderline between environmental and innovation economics (Rennings, 2000). The contributions on the issue coming from environmental economics have been mostly characterized by the debate relating to which policy instrument would be superior in stimulating the so-called *dynamic efficiency*³⁶, but an obstinate juxtaposition between market-based instruments and command-and-control standards have led to neglect the complexity of other determinants influencing innovative decisions in firms.

The economic of innovation, on the contrary, has principally paid attention to the inducing action of other factors, such as market-pull demand and the positive spillovers of R&D efforts in firms.

Notwithstanding the existence of such differences, these economic sub-disciplines should be used in a coordinated way, in order to understand the multiple forces underlying EI adoption and to deal with another essential peculiarity of environmental innovations, which is defined as the *double externality problem*.

³⁶ In environmental economics, *dynamic efficiency* is a concept related to the productive efficiency of a firm over a period of time. A firm which is dynamically efficient will reduce its average cost curves in the long run by implementing innovative and improved production processes, better working practices or a better management of human capital (Perman et al., 2012).

A firm which decides to invest in environmental innovations, will not only produce the common positive spillovers of innovations because their adoption can also lead to less environmental external costs (Ziegler and Rennings, 2004). However, while the society benefits from these innovations (with diminishing environmental burdens), all the investment costs have to be borne by the single firm which introduced the EI. So, even if an EI can be successfully marketed, it's difficult for the company to make long-term profits deriving from this innovation and to enjoy the financial benefits, because the corresponding knowledge, underlying the innovation, is easily accessible for imitators and the environmental benefits have a public good character (not excessively profitable). Moreover, EIs enjoy an initial disadvantage due to the competition from the existing "dirtier" technologies, which are less costly than the new ones. Therefore, due to the costs entirely borne by firms and the reduced profits, enterprises are not incentivized to invest in EI and the final result is a sub-optimal investment in cleaner environmental solutions³⁷. This explains why environmental and innovation policies should be coordinated in this scenario (Ziegler and Rennings, 2004). On the one hand, innovation policies can help to cut the costs of innovations, especially during the early phases of invention and introduction in the markets. On the other hand, environmental policies interventions are also fundamental, because they have a strong impact in stimulating EIs, by internalizing the external costs imposed by competing, non-ecological products or services, and protecting them. Indeed, as stated by Rennings (1999) *"as long as markets do not punish environmental harmful impacts, competition between environmental and non-environmental innovation is distorted. Therefore, the presence of an careful regulatory framework is determinant for stimulating eco-innovative behaviors"*. Starting from this general introduction, the following paragraphs will examine some of the multi-faceted determinants of EI in detail, with a particular reference to the eco-innovation effects of environmental policy instruments and on the action of some *endogenous* mechanisms such as self-regulated environmental measures (EMS) and Strategic CSR within the business boundaries.

³⁷ This is true, especially for those large-scale technologies of power generation (such solar or wind farms) whose economic returns are uncertain and far in the future.

3.4.1. THE INFLUENCE OF ENVIRONMENTAL POLICY

For clean eco-innovation technologies to be developed and diffused sufficiently fast and at the appropriate scale, a correct policy intervention is required and an adequate regulatory framework plays a particularly important role. As demonstrated in the previous section, the “private clean innovation machine” cannot be expected to be socially effective on its own, due to the existence of the *double externality problem* and the subsequent overall investment below the social optimum. Therefore in this context, it is important that private actors would be provided with the right incentives to invest in R&D of environmental innovative technologies, thus switching from existing “dirty” technological regime to a new cleaner one. In this sense, environmental policies should be designed to allow this transition at the lowest possible cost, deploying multiple policy instruments simultaneously, as there’re important complementarities to exploit (Veugelers, 2012).

The role of environmental regulation has been widely debate in the literature. On the one side environmental regulation has been seen as a threat to firms’ competitiveness. On the other side, instead, a strand of literature, aimed at testing the presence of a possible “win-win” solution, has emerged. This latter principally relies on the contribution by Porter and Van der Linde (1995), also known as “Porter Hypothesis”, which highlights the fact that a strict environmental regulation is not necessarily damaging competitiveness, but can often enhance it. Indeed, a properly design regulation may call firms’ attention about the inefficiencies related to pollution or resource waste, “suggesting technological improvements which could lead enterprises to a Pareto improvement, coupling environmental protection with competitiveness enhancement” (Ghisetti and Rennings, 2014).

However, as previously shown, most of the research on environmental economics has tried to demonstrate the superior effectiveness of various policy measures in stimulating EIs, both on the supplier’s and the user’s side. This large body of literature has assessed the role of eco-policy instruments on the rate of innovation through the use of different models (econometric and case studies; survey analysis of firms; mixed-method studies and meta-analysis), recognizing that, in general, the characteristics of a specific policy can affect the rate and the direction of a certain innovation (Kemp and Pontoglio, 2011).

Specifically, the theoretical debate which has opposed the so-called *market-based instruments* (which work by creating incentives for firms to voluntarily change their behaviors, altering the structure of pay-offs that agents face) and the *command-and-control regulations* (which instead operate by imposing mandatory obligations or restrictions on the behaviors of firms) was extremely interesting. This juxtaposition, aiming at demonstrating if a specific typology could lead to a superior dynamic (innovation) efficiency, thus inducing eco-innovation, has given rise to a strong interest from scholars and academics (Jaffe et al., 2002; Taylor et al., 2005; Vollebergh, 2007; Mickwitz et al., 2008; Pontoglio, 2010) but however, the results did not lead to clear and uniform outcomes, even underscoring a degree of incertitude for what may concern the positive or negative effects of these instruments in inducing EI.

3.4.1.1. MARKET-BASED INSTRUMENTS

The theory of environmental economics suggests that the advantage of *market-based instruments*, compared to *command-and-control regulations*, arises over time thanks to their permanent incentive to reduce polluting emissions, thus changing the underlying technology. Emission taxes, subsidies or ecological fiscal reforms, according to theory, are designed in order to keep the incentives alive for those who want to eco-innovate, especially in the field of emission reducing technologies, because a reduction of polluting emissions also means a significant cost reduction. In favor of this superior *dynamic efficiency* there are two empirical cases interesting to be reported. The first is the Swedish NO_x emission tax. Enacted in 1992 with the goal of limiting polluting emissions of this gas from energy sector and industrial boilers, its introduction played a fundamental role in stimulating advanced technological research, making the Nordic country a world leader in the manufacture of small low-emissions boilers. The second example was the introduction of a widespread and strict taxation system on water discharges in the Netherlands, whose functioning incentivized the development of a flourishing avant-garde industry in the sector of technologies for purification processes of wasted waters.

However, looking at the complex reality of environmental regulations, it is difficult to affirm unilaterally that *market-based* tools are always the best instruments to foster innovative responses, because it can also happen that their effective use could be watered down in the political process.

An interesting example, of the uncertain innovation effects of incentive-based instruments, can be drawn by the analysis of the influence of the *European Union's Emission Trading Scheme* (EU ETS) in promoting low carbon technologies.

The EU ETS is the world's biggest tradable permit scheme (currently applied to more than 11,500 firms and industries across 30 countries) and, since 2008, it's the Europe's flagship tool to meet its carbon mitigation objectives. The tradable permit system applies a *Cap and Trade* logic, through which the regulatory authority fix a maximum allowed quantity of pollution (*Cap*) which is converted in emission quotas that then will be distributed (through *grandfathering* or *auctioning*) to different polluting enterprises. Then, the firms are able to use these assigned allowances to justify their emissions, sell them or buy some others, in the case they would reach the maximum allowed level of pollution (*Trade*). One of the key objective of the EU ETS is to impact decision-making regarding new low-carbon technologies, incentivizing additional investments in low-carbon assets thus reducing investments in carbon-intensive products and processes.

Therefore, several studies have tried to assess the effectiveness of this instrument in meeting the *innovation goals*, but the empirical results have been contradictory and mixed, as already anticipated. A study lead by Calel and Dechezleprêtre (2012) for example, while comparing the changes in patenting activities protecting low-carbon technologies between ETS companies and similar non-EU ETS firms, showed that the system, even before its official launch, had already encouraged innovation in clean low-carbon technologies among regulated companies especially in France and Germany (Laing et al., 2013). Rogge et al. (2010), instead, starting from a survey analysis of the German power sector found that the EU ETS has had a general limited impact on promoting new EI, due to its lack of stringency in its early phases, even if a positive effect, however, was found in some specific areas such as *Carbon Capture and Storage* research and efficiency of coal plants (Rogge et al., 2010). Controversial results emerged also from the comprehensive study of Martin et al. (2011), aiming at exploring the reasons behind innovation performance and its dimensions. Their regression analysis showed that there was not a strong evidence that ETS' firms in general could differ in their innovativeness from non-ETS' firms, and this result could derive from the fact that in some cases ETS could have weakened net incentives for innovation by offering a "cheap way out" for enterprises (Kemp and Pontoglio, 2011).

3.4.1.2. COMMAND & CONTROL REGULATIONS

On the other side, the *dynamic efficiency* of command-and-control instruments has always been discredited under a theoretical perspective, alluding to the fact that their binary nature would discourage technological and innovative research, especially by polluters, since the discovery of new ways for reducing emissions (deriving from the adoption of a new EI) can constitute the basis of a more stringent future standard and thus. Therefore, once a firm adopts a technology which allows the minimum compliance with the maximum permitted limit of pollution (e.g. a new emission filter), then that firm will not have any incentive to search for new and more efficient cleaner technologies, because this would mean additional expenditures and decreasing profits. However, this is not always true and there have been several cases in which, on the contrary, the implementation of severe and stringent standard mechanisms (both quantitative and qualitative in nature) has encouraged a variety of innovations beneficial for the environment (Kemp and Pontoglio, 2011). One of this, for example, it was the *Auto-Oil Programme*, introduced in 1998 through the European Directive 98/70/CE, which, while prescribing stricter fuel standards and a progressive phasing out from leaded gasoline, incentivized the search for cleaner and less polluting fuels³⁸. A further successful regulatory policy was also the popular “Montreal Protocol on Substance that deplete the ozone layer”, entered into force in 1989, which was the first binding multilateral environmental agreement³⁹. The protocol applied limits to the production and consumption of the main chemicals causing the destruction of the Earth’s protective ozone layer and prescribed a progressive phasing out of the substances responsible for ozone depletion like CFC and HCFC, spurring the research for innovative solutions. The results of this binding environmental regulations have been consistent: in many sectors the requirements of the Protocol have stimulated innovation in the design of products and equipments with eco-benefits in terms of process efficiencies and reduced environmental impacts, while the production and consumption of the majority of harmful ozone-depleting chemicals has been successfully phased out, in both developed and developing countries.

³⁸ <http://ec.europa.eu/environment/archives/autooil>

³⁹ www.ozone.unep.org

These cases show that, even with a severe command-and-control system it is possible to induce a wide technological change, because while forcing the enterprises to reduce their emission more than a *business-as-usual scenario*, this can also incentivize the adoption of those *cost-reducing* innovations, namely those which can allow the achievement of a pre-fixed goal at the lowest possible cost.

Generally speaking, it can be stated that the supposed “superiority” of incentive-based instruments can be confirmed in soliciting innovative responses, especially for those *emission-reducing innovations*, while direct regulations appear to be more effective in promoting the *cost-reducing* ones (Kemp & Pontoglio, 2012). In conclusion, it seems that no instrument is generally preferable in incentivizing the diffusion of EIs, because the welfare gain of each instrument can depend on different sets of circumstances and the link between regulator and regulated is not unidirectional. EI, as seen, is a multifarious concept and therefore it could be useful to think in terms of design features or to consider the relevant characteristics of different policies and what effect, each of them, can have on innovation.

3.4.1.3. ENVIRONMENTAL POLICY ATTRIBUTES & ECO-INNOVATION

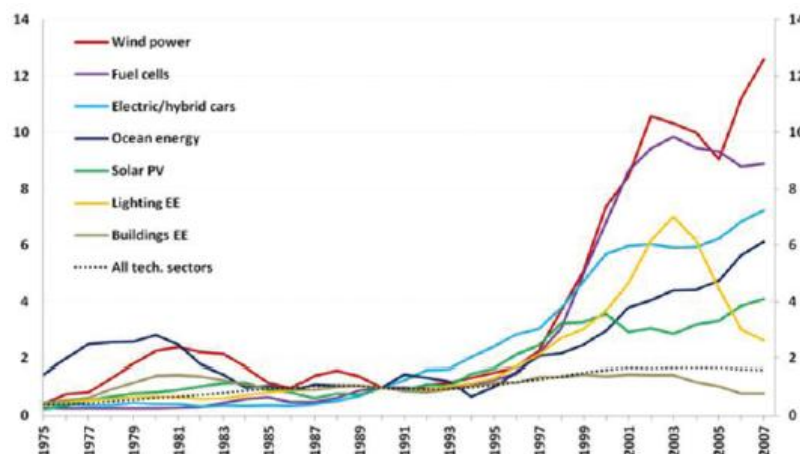
When dealing with the innovation impacts of environmental policies, the stark juxtaposition between market-based instruments and the direct forms of regulation, can be somewhat misleading, because the several inducing effects may depend more on some design features of policies rather than on the type of instrument chosen. The eco-effectiveness of a policy can be evaluated, for example, by looking at its effect on targeting directly the negative externality, or considering the *timing of implementation*, thus at which phase of the technology lifecycle that policy is used. (Kemp and Rennings, 2011). Therefore, it could be more helpful to think in terms of *vector of characteristics* of different policies, as outlined by Johnstone et al. (2010). There exist several attributes which can play a substantial role in supporting the long-term economic viability of eco-innovations. Within them, the policy *stability/predictability*, the policy *stringency* and the policy *flexibility* appear to be the most relevant factors.

A) PREDICTABILITY

Policy predictability is a relevant attribute in stimulating EIs, because the uncertainty of a national political regime, especially when associated to a certain degree of market uncertainty, can constitute a significant “brake” on investments in EI. These investments in environmental R&D (as well as non-eco investments) are risky and can have ambiguous outcomes, and this incertitude can give rise to a commercial risk associated with those innovative activities. Moreover, if the policy framework shows signals of instability and uncertainty – i.e. not providing clear policy indications over firm’s long-term planning horizons – this could induce further delays in the investments, because firms may choose to wait before undertaking specific green decisions, postponing them and looking for alternative ways to reduce their costs.

Therefore, in order to stimulate companies to invest in green business practices, the authorities should ensure a regulatory environment consistent over time, that would offer a long-term provision of political incentives with clear policy targets. Indeed, a clear and stable regulatory framework can send a signal to markets about how to price carbon or tax resources, helping to ensure a level playing field with less competitive distortions or disruptions to trade, and thus having a great influence on the adoption and development of green technologies (Johnstone et al., 2010). One explanatory example refers to the evolution of some environmental technologies patents, specifically related to renewable energies, from 1975 to 2007. The lines show a clear growth from 1997, year during which the Kyoto Protocol was adopted. Therefore, this representation corroborate the fact that a strong political will and clear political signals are needed for innovations in the environmental domain.

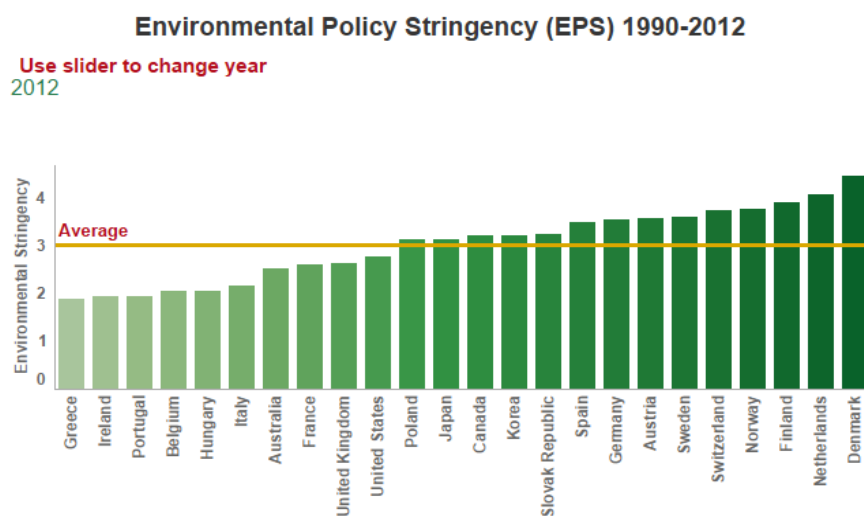
Figure 13. Patenting activity pre-and post Kyoto Protocol’s adoption in 1997



B) STRINGENCY

In order to assess the innovativeness effect of a certain policy, it is also important to ask “how ambitious is the environmental policy target, relative to the *baseline* emission trajectory?”. The effect of *policy stringency* on innovation is also defined as “induced innovation hypothesis” and several empirical firm-level studies have investigated the correlation between a stringent environmental regulation and technological change, confirming this inducement hypothesis. The positive effect of *policy stringency*, was demonstrated, for example, by Johnstone et al., (2010), who found a positive correlation with the degree of stringency of some specific regulations (such as the American Clean Air Regulation on NO_x) and the likelihood of developing innovative technologies for air and water pollution abatement but also for solid waste management techniques. Indeed, since markets often fail to put a fair price on environmental resources, thus internalizing the negative effects of pollution, a stringent policy could affect relative input prices or change the opportunity costs associated to the use of environmental resources, incentivizing polluting firms to seek improvements in those emission-saving technologies which would allow them to avoid the increased costs imposed by the policy. In this regard, the OECD has developed a country-specific indicator, called *Environmental Policy Stringency Index (EPS)*. The index is based on the degree of stringency of fifteen environmental policy instruments and ranges from 0 (not stringent) to 6 (highest degree of stringency), covering 29 OECD countries for the period 1990-2012. Figure 13, offers a graphical representation of the index.

Figure 14. Environmental Policy Stringency Index.



C) FLEXIBILITY

Among the prominent attributes of environmental policies, also flexibility has also been found to have a positive impact on EIs. Once again Johnstone et al. (2010) in their research paper have assessed whether countries with more flexible environmental policies would be more likely to induce widely diffused eco-innovative solutions than countries which adopt more “prescriptive policies”, finding positive and significant results. However, it also emerged that this flexibility belongs both to market-based instruments and even to direct forms of regulations and this element, in general, could imply that “*governments should give firms strong incentives to look for the optimal technological means, across a wider space of possibilities, to meet a given environmental objective and thus complying with the regulations.*” (Johnstone et al., 2010).

In general, it is possible to conclude that public environmental policies, both through market-based tools and regulatory instruments, have a significant influence in stimulating country-level eco-innovative transformations and inducing changes within business’ models. As expressed by several results coming from empirical research, the effectiveness of these policies can also depend on several characteristics, such as political stability, the existence of a coherent national environmental strategy with long-term objectives, the stringency of the regulatory framework and the inherent flexibility of each instrument. Moreover, a strong role of governments, linked with the adoption of a forward-looking vision, is often indicated as an important driver in supporting the creation of wider favorable conditions for large scale eco-innovative projects (e.g. *green and smart cities*) aimed at producing systemic shifts within the macro-characteristics of an economic system.

However, there’s still an incomplete view about which combination of instruments is most effective in stimulating clean innovation creation, even if a combination of well-designed, time consistent policies – such as the complementarity of carbon taxes, public clean subsidies and performance-based regulations – would stimulate the adoption of EI rather than singled out policy measures (Veugelers, 2012).

An interesting example of successful national policy, which has incentivized the diffusion of EI and has paved the way for a low-carbon and resource-efficient economy, is the German “*Energiewende*”, reported inside Box number 8.

BOX 8. The German “*Energiewende*”

The German *Energiewende* or “German Energy Transition”, is one of the most successful example of environmental policy able to incentivize a transformation in favor of environmental innovations.

In the 90’s, the Bundestag enacted a law which set a fundamental principle: the producers of renewable energy had the right to feed their energy into the public power grid, and the public agencies had to compensate them with a specific feed-in-tariffs.

In simple terms, people were paid to produce energy, but the price was not higher enough to compensate the costs and to trigger a positive boom of renewable technologies. The turning point arrived in 2000, when the government approved a fundamental law which established a renewed system of incentives, with feed-in-tariffs guarantee for twenty years. The underlying principle of this law was that the incentivizing tariffs (fixed at a price of 50 eurocents per kilowatt-hour) had to be high enough to allow investors (both private citizens and *energy cooperatives*) to make profit.

This element indirectly boosted a progressive transformation of national energy-system towards a greener path, because the fees contributed to reduce the costs of solar and wind energy, making them competitive with conventional fossil fuels. In this context, renewables started to spread all over the national territory: in the north of Germany, characterized by a windy climate, wind turbines started to be installed, while in the south, expanses of solar panels started to gain an increasing quantity of ground.

In parallel to this boom, a flourishing industry, devoted to panel’s production and to high-technological research, gained consensus, with important achievements for what concerns improvements in the efficiency and long duration of panels.

The success of *Energiewende* has accelerated after the nuclear incident of Fukushima of 2011, which pushed the Chancellor Merkel to command a closure of nuclear reactors.

In 2012, throughout the country, 7,6 Gigawatt hours of photovoltaic panels were installed and only in 2014 the country obtained the 27% of its domestic energy needs from renewables sources, a level three times higher than the one achieved ten years ago and the double compared with the one of US.

German citizens have successfully financed this success, paying a higher price on their electricity bills, and, according to various researches, more than 90% of them is favorable in supporting these higher costs. This element demonstrates how a well-designed policy is the one which is able to achieve targets and objectives while obtaining consensus and approval from population.

3.4.2. THE ROLE OF ENDOGENOUS FACTORS

When dealing with the determinants of EIs, especially if referring to contexts characterized by a weak or unclear environmental regulatory framework, it's important to take into account also the innovative-inducement effects coming from the category of so-called *endogenous* factors, thus the ensemble of voluntary proactive approaches to environmental protection, which businesses can activate within their internal boundaries. As already expressed, EIs present a multi-faceted structure and their adoption is not only determined by the existence of an adequate regulatory pull/push framework but it can also depend on the presence of some internal forces, more connected with environmental-responsible attitudes and innovative business models, which can provide a promising potential for the creation of long-term positive environmental impacts. By replacing old business practices, innovative business models can, for example, enable firms to restructure their value chain in a sustainable manner, generate new types of producer-consumer relationships or even alter the consumption culture and the patterns of use, enabling systemic changes essential for the achievement of a fully-integrated sustainable development.

Within the group of these *endogenous* factors, it's primarily important to underscore the role played by the so-called *organizational innovations*, thus those innovative practices aimed at reconfiguring the internal organizational structures and competencies through, for example, the implementation of an Environmental Management System, or the application of a long-term CSR-based strategy, applied within business' boundaries.

Different empirical results (Ziegler and Rennings, 2004; Mazzanti and Zoboli 2006; Kesidou, 2012; Les Bas and Poussing 2013; Horbach, 2014) have showed that increasing investments in EIs can be influenced by the existence of a stock of accumulated internal competencies, capabilities and *soft skills* of the firms.

These factors are, of course, heterogeneous across firms, countries and productive sectors and depend on several factors, such as the firm's size (large firms have more skilled internal resources to engage in environmental management than smaller firms), the market positioning of firms or their capacity to catch and internalize external knowledge.

Particularly relevant is the linkage between CSR and EIs. According to some authors, a “virtuous circle” exists between the adoption of a CSR strategy and the subsequent adoption of innovations. In this sense, CSR could constitute the gateway to more innovative behaviors, because its implementation can lead to a more sustainable and less risky approach, thus offering a stable framework for companies that want to innovate sustainably and with less uncertain risks. As stated by MacGregor and Fontrodona (2008) *“Implementing CSR makes companies more innovative: CSR can be a starting point for a proactive innovation (even in the environmental domain) also for those companies that wish to improve their position in their industry but are generally risk-averse. Innovation tends to be risky, whereas CSR can be a mean of reducing risk”*.

3.4.2.1. INTERNAL ORGANIZATIONAL INNOVATIONS

The presence of innovative organizational capabilities and practices concerning the environment (most of time voluntarily introduced) within the internal business structure, may stimulate firm’s dynamic capabilities, thus pushing the adoption of EI. This important supply side factor occupies an increasing role in the theoretical discussion about the inducement factors of EIs and, as demonstrated by different studies, its existence within business boundaries seems to strongly stimulate them.

These elements belong to the macro-category of the so-called *non-technological innovations*, which, as already stated in the previous pages, can be considered as opposed to *technological innovations*, which instead affect the firm products and processes, even if the two concepts clearly interplay. According to the definition offered by CIS 2008 survey, an organizational innovation is *“a new organizational method in enterprise’s business practices, workplace organization and external relations that has not been previously used by the enterprise”* (Le Bas and Poussing, 2015).

Within the set of heterogeneous self-regulated organizational instruments able to promote green innovations, the role played by the Environmental Management Systems (EMS) is really important. As outlined in the previous chapter, EMS are considered voluntary organizational frameworks that formalize changes in the organization of firms, by articulating environmental goals and by specifying procedures and responsibilities used to manage the impacts of firms on natural environment, with the purpose of making continuous improvements in the whole corporate environmental performance (Kesidou, 2012).

In particular, two main EMS frameworks are widely diffused worldwide: the Eco Management and Audit Scheme (EMAS) and the ISO 14001 standard.

In general, the adoption of an EMS can provide some advantages of organizational, managerial and economic nature, besides those connected to a strengthened company's external reputation, because the implementation of an EMS could represent a tremendous opportunity for those companies which wish to change their traditional practices of doing business, to modify their thinking and to accumulate the necessary *soft skills* that would enable them to initiate environmental research and development activities.

A reconfiguration of internal competencies and the re-design of firm's operations – in order to reduce the environmental impact and bring economic benefits at the same time – could induce a pro-active attitude in searching for eco-innovative solutions. Therefore, firms introducing innovative business' models together with a responsible management of environment, may be influenced in their decision to invest in “environmental” R&D, thus in eco-innovative activities.

A large number of empirical studies has faced the linkages between organizational innovations, mainly EMS, and EI adoption, and most of them have found that the implementation of an EMS (both with ISO 14001 or with EMAS) has a positive impact upon EI, even if, once again, the empirical evidence is still not completely clear and unidirectional, because there could be, for example, some innovation complementarities which can affect the significance of final outcomes or differences for what concerns product or process innovations⁴⁰.

The study of Ziegler and Rennings (2004) exhibits, for example, a low statistical reliability of certified EMS, outlining the fact that while ISO 14001 standard has a significantly weak positive influence, the European EMAS standard has no significant effect on environmental innovations at all.

Mazzanti and Zoboli (2006) instead, found a clear and positive association between all innovations output and voluntary auditing schemes, by underlying, in particular, the incremental nature of EMAS certification towards ISO 14001.

⁴⁰ An extensive review of the literature in this field of studies, and more in general about eco-innovations, is offered by the wider study of Barbieri et al. (2015).

Rennings et al. (2006), choosing to focus only on EMAS-certified firms, analyze how different characteristics of a Management System – such as its maturity or its strategic importance – could affect the adoption of green innovations. The authors, after having confirmed a positive innovativeness effect of EMS, outline that, in particular, the maturity of an EMS (assessed by keeping into account the age of the EMAS adoption) may affect the adoption of environmental process innovations, rather than of product innovations.

A study of Rehfeld et al. (2007), while testing the effects of environmental organizational measures on environmental product innovations in German firms, shows that the adoption of an EMAS or an ISO 14001 certification, in contrast to what stated by Ziegler and Rennings, can positively influence the adoption of environmental product innovations.

Also Les Bas and Poussing (2014) conclude their empirical research by stating that organizational innovators (thus those enterprises which have a certified EMS) are more inclined to innovate with benefits for the environment, specifically underscoring a positive complementarity between innovative organizational measures and processes innovations in increasing the probability to perform environmental innovations.

However, in conclusion, as pointed out by Ziegler and Nogareda (2009), the adoption of a EMS could also be reversely affected by product and process innovations of environmental nature, thus finding evidence of the existence of a bidirectional link between EMS and EI (Ziegler and Nogareda, 2009).

3.4.2.2. CSR AS INDUCING FACTOR FOR ECO-INNOVATIONS

Among the firm's internal factors which can have a significant influence in shaping a pro-(eco)innovative attitude, the existence of a Corporate Social Responsibility strategy seems to play a relevant role. CSR and innovation have rarely been discussed together in the literature and even less has been done for what concerns the fit between CSR and EIs. The research, while investigating the inducing action of external factors (environmental policies), has not sufficiently taken into account the positive impact of firm's CSR in favoring green/clean technologies, because, due to the versatility of the concept, it has not always been easy to adequately measure a strategic CSR commitment.

In this respect, the recent empirical studies conducted by Les Bas and Poussing (2013, 2014) appear to be a breakthrough in this limited field of research.

CSR, as widely assessed in the previous chapter entirely devoted to the topic, is a multi-faceted issue, whose notion itself means different things to different people.

This concept is increasingly becoming a part of company discussions worldwide, in the quest for greater value and long-term competitiveness, and nowadays, being a socially responsible company is more an imperative than just a simple binary choice.

It has also been shown that CSR has different dimensions, one of which is the so-called CER, or Corporate Environmental Responsibility. Therefore, it is possible to state that a responsible firm is the one which does something good for the environment on a voluntary basis (Azzone et al., 1997).

CSR consists of a set of voluntary actions which primarily involve a modification of principles and values at the base of an organization's structure, towards a long-term sustainability perspective and more innovative scenarios.

In this respect, firms have to responsibly reconsider, with the lens of responsibility, the linkages between them and the external dimension (including the societal domain and the natural environment) and activate a multi-stakeholders' engagement, in order to satisfy all the critical instances coming from the societal actors interested in the company's activities.

As seen, firms get involved in CSR in order to avert political conflicts (e.g. regulatory threats), avoid public pressures, respond to a market demand of clean and green products (coming from those consumers willing to pay higher prices for them) or because they consider CSR as a company's value, a solid base for its long-term survival on the competitive markets.

The implementation of a well-structured CSR strategy is able, in most of cases, to bring economic benefits and to increase firm's economic and financial performances on the long-run even if, sometimes, the perception of CSR as something merely esthetic or camouflaging, can lead to counterproductive financial results. In fact, CSR is not a fixed and unalterable framework which fit the same for all companies but it must be patterned depending on the specific features and characteristics of companies.

Therefore, the simple adoption of a minimalistic CSR, (which corresponds to *informal* CSR, in accordance with the CSR classification referred to previous chapter) with no coincidence between the company's strategy and CSR activities, can be perceived as a "social/green washing" operation with even negative economic returns on firm's profitability. The firms that are less innovative and less prone in meeting stakeholders' needs may send a negative signal of incorrect or opportunistic behavior, degrading their legitimacy and performances.

On the contrary, those businesses which are in an *Innovative* or *Dominant CSR* phase, in which CSR is the basis of the overall business strategy and it permeates all its actions, can guarantee a simultaneous satisfaction of both social expectations and economic returns, creating that Shared Value defined as "*a more sophisticated form of capitalism*" able to reconnect company and community success (Porter and Kramer 2011).

An advanced type of CSR strategy, may induce the adoption of eco-innovative behaviors. Firms, especially when they are in these last phases of CSR evolutionary process, long for those innovative solutions capable of creating both tangible and intangible competitive advantages, while guaranteeing a simultaneous satisfaction of multiple firms' stakeholders. Indeed, the launch of R&D programs for environmental product or process innovations requires, as primary duty, a re-definition of different types of relations within all business units and a re-organization of the relationships with the economic players of interaction. For example, the introduction of initiatives for the design of a recycled product (*eco-design*) might involve a radical revision of logistics processes and the delineation of new long-term relationships with suppliers, aimed at defying specific characteristics of product which would be coherent with the technological constraints of these projects (Azzone et al., 1997). Therefore, the existence of intangible resources, such as CSR, which is unlikely accessible for imitators and thus difficult to copy, could offer firms the required knowledge to easily implement eco-innovations. On the contrary, those firms which engage in CSR initiatives for short-term strategic reasons and in a minimalistic way, could encounter greater difficulties in implementing EIs, because less ready to introduce a disruptive innovation of internal structures. In order to better understand this linkage, it's relevant to consider the empirical studies (2013, 2014) conducted by Christian Le Bas and Nicolas Poussing , two French professors who are among the first scholars having focused their attention on this issue.

Inside their empirical researches, they try to offer a quantitative evidence to this fundamental question, empirically verifying if the presence of a CSR strategy would play or not a role in incentivize EI adoption.

Starting from a fundamental distinction between two types of CSR, namely *strategic* or *proactive CSR* and a *responsive* or *defensive CSR* ⁴¹, the authors investigate if a social/environmental responsible attitude matters in inducing green-innovative behaviors. Through the use of two merged Luxembourgish data sets (one coming from a survey on CSR practices by firms, the other coming from CIS 2008 Survey) analyzed using a bi-probit model, the authors obtain an estimation of results which confirm the relevance of CSR in explaining environmental innovation (with a significant effect when the firm is *product innovator*). Moreover, the empirical findings confirm that a differentiated CSR profile matters in explaining firm innovation behavior, showing how a *responsive CSR* has no impact (or even a negative one) on the probability to innovate in environmental area, while the impact of *strategic CSR* is positive (in both processes and products innovations) even if not always statistical significant.

These results confirm what previously stated: firms that have fully integrated CSR into their business strategies perform better in terms of eco-innovations. On the contrary, those firms which do not align CSR with their internal organization and their strategy, can have consistent difficulties in implementing innovative procedures, because this lack of alignment likely hinders their technological innovative ability, thus acting as a barrier. The existence of a long-term CSR-based strategy, opposed to a more minimalistic reactive one can lay the foundations for a forward-looking and anticipatory mindset which could pave the way for the adoption of eco-innovative solutions.

A company which adopts a proactive CSR behavior continuously strives to find and create breakthrough *green* solutions, especially in a context characterized by challenges of climate change, which undermines business competitiveness in the long-run.

⁴¹ A *Strategic CSR* requires an alignment between CSR and the firm's core competences, and even with its growth strategy. A *Reactive CSR* on the contrary reflects a more adaptive, passive firm's behavior

A strategic CSR approach can stimulate business' creativity, enabling enterprise to redesign products and processes along the entire value chain in a more sustainable and greener manner, thus producing more business opportunities and larger competitive advantages. Indeed, the economic benefits deriving from environmental innovations are usually underestimated by managers, due to the costs associated to collecting proper information about the values and returns of different EIs, thus leading to sub-optimal levels of environmental efforts (Ghissetti and Rennings, 2014). This problem could be easily faced if a firm is already careful about environmental issues, and if it's already implementing a CSR strategy which attribute responsibilities and duties inside business' boundaries.

Therefore, the strategic inclusion of social and environmental concerns into firm's core business model can lead to enhanced technological EI, because CSR is able on the long-run to tear down those internal barriers to their adoption. Indeed, a well-designed CSR implies a deep redefinition of business model, and this can leverage the crucial systemic changes needed for sustainable progresses. As stated in Bocquet et al. (2014), *"a proactive management of internal governance and organizational structure is an instrument that could enable firms to maintain a dynamic alignment with their general business environment, to eco-innovate and then to generate higher economic returns"*.

CSR process can be used as a potential framework in which environmental innovations can be identified and then exploited to the company's advantage (Asongu, 2007). Therefore it's important that corporate leaders should remain vigilant in order to recognize opportunities to use eco-innovations to their advantage. If companies say that "they're green", then they also have to "act green", implementing the best green technologies available on markets and searching for the newest and the most effective ones.

Companies that behave under a CSR framework, can easily become technological leaders, as they strive for imaginative new methods to reduce pollution and increasing efficiency, thus having consistent cost-savings.

A well-designed reorganization of production methods and a more efficient attribution of competencies can, indeed, help the management to identify and detect all the resource-use inefficiencies, thus allowing those monetary gains, which then can be re-invested in R&D and innovation.

Incorporating CSR, in the firm's strategic dimension, thus ensuring the dynamic alignment of CSR activities with the firm's general business strategy, makes companies more successful and innovative, even in the environmental domain. This element could be especially healthy for those firms (even small-medium size firms) aiming at improving their position in their industry, but which are generally risk-adverse. Therefore, it is also possible to talk about *CSR-driven eco-innovation*, thus an innovation driven by values for the creation of environmental-friendly products and services. In this sense, CSR can be a stabilizing factor in a rapidly changing environment, thus enabling the diffusion and adoption of green eco-friendly technologies.

3.5. REMARKS

In this chapter it has been deeply discussed what do eco-innovations mean, how they are classified and measured, which the main drivers behind their adoption are and why it's crucial nowadays to incentivized their large-scale diffusion.

As it has been demonstrated, adopting a systemic responsible approach toward business through CSR and eco-innovation, is a necessity, rather than an exception. All man-made developments, including cities, energy systems and infrastructures will not be suitable without long-term efforts aimed at enhancing bio-capacity and resilience of ecosystems, because the challenges imposed by climate change and by the crisis of modern capitalism, are increasing in intensity and hazardousness. Therefore, if the pathway toward a green and low-carbon economy is to be followed, it's fundamental to progressively change those non-sustainable attitudes, which have characterized human society since now, and embrace a more socially and environmentally responsible viewpoint. However, this larger systemic shift towards sustainable social and economic eco-systems can be achieved only if the whole society would dispose of new ways and technological green methods to accomplish its functions. These leading factors are usually represented by EIs, as they play a crucial and dynamic role in generating positive benefits, both economically and environmentally. The environmental benefits, usually associated with the gains in resource and energy efficiency and the reduction of negative externalities, such as air pollution, soil and water contamination or greenhouse gases emissions, are the most evident.

However, there can also be wider economic, and even social consequences of eco-innovation development and adoption (e.g. the creation of new employment, through the so-called *green jobs*).

Particularly, in a context of global sluggish economic growth, EIs can offer companies increasing opportunities to capture economic value through finding new business opportunities, new ways of delivering value to customers, triggering new consumption patterns and markets, new streams of revenues or reconfiguring their value chains (Technopolis, 2012).

At the same time, adopting more sustainable/responsible business models and eco-innovative solutions, could ensure a range of financial benefits, including savings of resources, cuts in associated costs, a better quality of services and products offered to the markets and additional profits, which could strengthen the business competitiveness on the long period.

A deep research effort has been devoted to the analysis of the economic performance effects of improvements in the environmental performances at various levels of analysis, and a range of empirical studies has been devoted to test the question if “*Does it pay to be green*”, obtaining a mixed picture on the sign of this relation (Ghisetti and Rennings, 2014). The empirical evidence which has looked at this relationships, has obtained mixed conclusions, also due to the variety of financial performance measures used (including some indicators of firms’ productivity) and the heterogeneous empirical approaches adopted by different researchers ⁴².

The study conducted by Duchin et al. (1995) confirms, for example, a positive effect of EIs on trade, and on the opening up of new markets.

Positive results have been reached even by the empirical researches of Lanoie et al. (2011) and Bocquet et al. (2014). The former, starting from a sample of about 4,200 facilities from seven OECD countries, shows that environmental R&D expenditures have a positive effect on a binary indicator of business performances. The latter, instead, using a merged sample of 213 Luxembourgish firms, shows that the innovation variable has a positive impact on firms’ growth, though the size of this effect could depend on the type of innovation implemented (which is confirmed to be greater for process and complex innovators).

⁴² Once again, the precious paper of Barbieri et al. (2015) provides a pertinent list of the empirical works which have tried to better explicate the nature of this linkage

A confirmation that less polluting firms benefit from improved financial performances also comes from Hart and Ahuja (1996), who highlighted that Operating Performance (measured through Returns on Sales – ROS – indicator and Returns on Assets – ROA) was benefiting from the year after the initiation of pollution prevention strategies.

Uncertain results emerge, instead, from the research conducted by Ghisetti and Rennings (2014). Using a sample of German firms, the authors empirically assess the relationships between economic returns (measured again in terms of ROS) and the adoption of green innovations, finding a double result: *“while environmental innovations aimed at improving resource and energy efficiency have a positive influence on financial performance, those aimed at reducing externalities tend to worsen it”*. Also the empirical paper by Mazzanti and Zoboli (2009), while exploring the connection between economic efficiency (measured by labour productivity) and environmental performances (measured through emission intensity indicators), finds a negative relationship between the two measures. These heterogeneous results point to the conclusion that the question is no longer if it “does it pay to be green”, but rather “when” or “for whom it pays”. Drawing on the study of Ghisetti and Rennings (2014) the question has to be better qualified in terms of the typologies of environmental innovations to be considered. Therefore, in order to shed the light on the economic and financial effects of EIs, it’s important to empirically assess this correlation, answering to the question *“How does it pay to be green?”*.

In this respect, an empirical analysis will follow in the next chapter, and through the use of a regression’s model, the existence of a certain degree of correlation between firms’ profitability and the adoption of EIs, measured with appropriate indicators, will be investigated. The empirical strategy is based on a sample of French firms and makes use of a merge of two different datasets, one elaborated by the National Institute of Statistics and Economic Studies – INSEE – and containing objective accounting data of French companies referring to 2009, while the other extrapolated by the Community Innovation Survey of 2008, which contains self-reported qualitative information about environmental innovations applied during the period 2006-2008.

CHAPTER IV

EIs and Financial Performance an empirical analysis

4.1. A DESCRIPTIVE OVERVIEW

Before proceeding with the empirical analysis, which represents the core issue of the present chapter, aimed at investigating the existence of a correlation between the adoption of eco-innovations (considered as a proxy indicator for CSR) and corporate financial performances, it's useful to provide a theoretical framework about the “state of the art” of EIs across Europe.

In this regard, the use of descriptive statistics concerning the adoption of environmental innovations, seems to be appropriate for a first cross-country comparison. In particular, are useful those descriptive data coming from three different sources, which have elaborated, over the years, accurate statistics with respect to the diffusion of EI across European borders.

The first is the dataset of Community Innovation Survey of 2008 offered by Eurostat, which provides statistics split by countries, type of innovators, economic activities and size classes⁴³. CIS 2008 was published in 2009, on a three-year reference period (2006-2008), and 26 Members States (all except Greece) plus Iceland, Norway and Turkey took part in the survey. As outlined before, CIS 2008 differs from other surveys because it includes information not only on product and process innovations, but also because it is complemented by an ad-hoc module on those innovations with environmental benefits. The statistics on EI elaborated by CIS are collected through a harmonized questionnaire distributed to European enterprises, and therefore are derived from *self-reported information*.

⁴³ <http://ec.europa.eu/eurostat/web/microdata/community-innovation-survey>

The second dataset, used to obtain useful statistics about EIs, is the public database of OECD, which includes data and metadata for OECD countries and selected non-member economies⁴⁴. The statistical information, referred to eco-innovations included in this database, are mostly expressed in relation to the total number of patents in environmental-related technologies released by each country, during the period from 1999 to 2013. Patents, as previously expressed, are a key measure of innovation output, because they reflect the inventive performance of countries, regions and firms. They are used to track the level of diffusion of knowledge across technology areas and they have the advantage of covering a broad range of technologies on which there are sometimes few other sources of data, as indeed is for environmental innovations (Hašič and Migotto, 2015). The patent-based innovations indicators proposed by OECD, are suitable for tracking developments in environmental-related technologies and assessing countries' and firms' innovative performances in the environmental domain, and they're identified using a classification method, specifically developed for this purpose (for this, see Box No. 6 in Chapter III).

The third reference source is the database supplied by the Eco-Innovation Observatory (EIO), a three year initiative financed by the European Commission's Directorate-General for the Environment, which ended in 2013⁴⁵. The EIO worked as a platform for the structured collection and analysis of an extensive range of eco-innovation information, gathered from across the EU and its importance has laid in the creation of the *Eco-Innovation Scoreboard*, an important indicator to assess and illustrate eco-innovation performances across the EU Member States. This indicator it is useful because it shows how well individual Member States perform in different dimensions of EI compared to the EU average, promoting an holistic view on economic and environmental performance. The *Eco-Innovation Scoreboard* covers a time series from 2010 to 2013, and relies upon 16 sub-indicators, grouped into five thematic areas: EI inputs, EI activities, EI outputs, resource efficiency results and socio-economic outcomes.

⁴⁴ <http://stats.oecd.org/>

⁴⁵ <http://www.eco-innovation.eu/>

4.1.1. COMMUNITY INNOVATION SURVEY 2008

The starting point for assessing the diffusion of environmental innovations across Europe, is the analysis of the results coming from the eco-innovation module developed for the Community Innovation Survey of 2008, which enables the possibility of conducting a useful country comparison, by looking at the different development levels of eco-innovations, at the heterogeneous sectors' structures or at the existing innovation systems for the diffusion of EIs (Horbach, 2014). In particular, the questionnaire asks respondents if, during the period from 2006 to 2008, they have introduced an innovation (distinguishing between product, process, organizational or marketing innovation) with one or more environmental benefits, classifying them as those "occurred during the use of the innovation by the enterprise" or "arisen during the after-sales use of a product by the end users". The former include: a reduced material use per unit of output; a reduced energy use per unit of output; reduced CO₂ footprint; replacement of materials with less polluting or hazardous substitutes; reduced soil, water, noise or air pollution and, lastly, recycled wastes, water or materials. The latter, instead, consists of: reduced energy use in the final products; reduced air, water, soil or noise pollution from their utilization and improved recycling of product after the final use ⁴⁶. This seems to be an appropriate distinction, because these environmental benefits can occur within the borders of the enterprise (such as a reduced level of GHG emission per unit of output, from productive activities) or can be obtained through the use of the innovative product by the end user, such as it happens for low energy consumer appliances (Arundel and Kemp, 2009). Moreover, the survey also assesses which are the drivers which have spurred the adoption of EIs, asking to respondents if, during 2006 to 2008, they introduced an environmental innovation in response to: the action of current or expected regulations (including taxes on pollution); a current or expected market demand from customers; the availability of financial support by governments (grants, subsidies or other financial incentives); the existence of voluntary codes or industry agreements within firms' boundaries.

⁴⁶ The last version of CIS, conducted through 2012-2014, investigates in great detail these benefits, even asking if the enterprise has introduced an EI with gains concerning a reduction of water use per unit of output or a replacement of fossil energy with renewable energy sources.

A first analysis of CIS data which is interesting to deal with, is offered by Horbach (2014) and reported in the following table. The author, taking into account the categorization of environmental benefits spurring from EIs, calculates an aggregate percentage about the green innovative behaviors of nineteen different European countries.

Table 3. Specialization of nineteen European countries in different sub-fields of EI

Countries	Environmental benefits within the enterprise						Env. benefits from after sales use of a good or service by the end user		
	Material	Energy	CO ₂	Dang. substances	Air, noise, soil, water	Re-cyc.	Energy	Air, noise, soil, water	Re-cyc.
Bulgaria	11.6	13.6	6.0	10.0	10.6	8.7	8.8	8.1	6.2
Cyprus	6.8	8.7	5.4	5.7	8.3	8.6	3.4	3.9	3.7
Czech Rep.	20.4	24.3	14.5	16.9	22.4	31.4	21.4	21.0	20.4
Germany	36.6	42.4	33.3	24.4	37.6	36.7	35.2	27.7	23.2
Estonia	15.2	16.4	6.2	10.3	15.2	14.5	10.8	8.6	7.5
Finland	23.0	23.6	19.2	17.2	16.8	23.3	23.2	14.8	15.43
France	17.9	18.5	13.4	16.1	15.3	23.8	15.2	10.7	11.6
Hungary	37.3	42.7	19.9	34.1	34.5	30.3	21.2	20.0	13.4
Ireland	18.9	22.5	22.0	19.4	17.6	34.23	20.6	14.9	22.6
Italy	10.3	14.5	13.0	16.0	23.7	25.1	23.9	23.9	22.5
Lithuania	12.6	14.3	9.9	12.9	11.8	10.0	9.7	9.4	7.5
Luxembourg	26.5	31.6	32.7	30.6	27.8	48.0	31.6	20.7	29.9
Latvia	9.7	10.2	7.8	9.4	12.3	6.5	8.5	9.9	4.9
Malta	7.8	9.6	5.1	7.3	5.1	12.1	9.2	3.5	7.4
Netherlands	13.8	19.7	16.6	22.4	20.9	22.9	21.9	18.9	15.2
Portugal	27.9	30.0	22.0	30.9	35.5	46.9	28.0	28.8	31.4
Romania	16.9	18.3	12.8	12.0	18.6	18.9	16.7	17.0	11.8
Sweden	31.0	36.6	30.4	30.5	29.6	27.6	33.5	26.8	21.9
Slovakia	11.1	12.9	7.3	10.9	13.8	14.8	11.2	10.7	10.5
Total	17.8	20.7	15.3	17.8	20.8	24.7	19.8	17.5	16.3

Source: Horbach, 2014

Going through the results, a distinction then emerges between a greener innovativeness attitude by those Northern-Western countries, such as Germany, Sweden, Luxembourg and Finland, versus the one recorded for the Southern-Eastern ones, as Bulgaria, Lithuania and Romania, except Hungary.

Indeed, as stated by Horbach, “on average, the Eastern European countries are less eco-innovative compared to the other countries”, and this element could be better analyzed and understood, by looking at the different trigger factors of EIs. Horbach finds that for Eastern European countries, environmental regulation seems to be an important driver especially for the “traditional fields” of EI such as air, water, soil pollution,

recycling and replacement of dangerous substances (Czech Republic 61%, Romania 66%, Lithuania 70%) and this is coherent with a low environmental awareness spread in these countries. On the other side, for what concerns those “young emerging fields” of EI, such as material or energy saving measures, it emerges that the Eastern countries are also more dependent on governmental subsidies and on external R&D “confirming a significant influence of the State for the realization of eco-innovations” (Horbach, 2014).

Generally speaking, aggregated percentages show that almost all European countries, the reduction of energy use per unit of output is an important innovation field, and this is especially true for Germany (42,4), Hungary (42,7) and Sweden (36,6). Furthermore, the recycling sector seems to be also a relevant sector where enterprises decide to “eco-invest”, as demonstrated by the high values of Luxembourg (48), Portugal (46,9) and Ireland (34,23).

The smallest countries as Malta, Latvia and Cyprus show the lowest values in nearly all domains, and this is coherent with a scarce attitude of the enterprises to invest in expensive technologies for internalizing damaging environmental impacts and with the difficulties related to their geographic positioning. On the contrary, Luxembourg, notwithstanding its dimensions, is an innovative country, as the high values demonstrate, and this can be explained by its higher capacity to attract external knowledge and green skills, due to the favorable conditions it offers to investors and partners.

If we look instead at France, it emerges that French enterprises exhibit good performances in the recycling sector (23,8) and in the field of energy reduction (18,5).

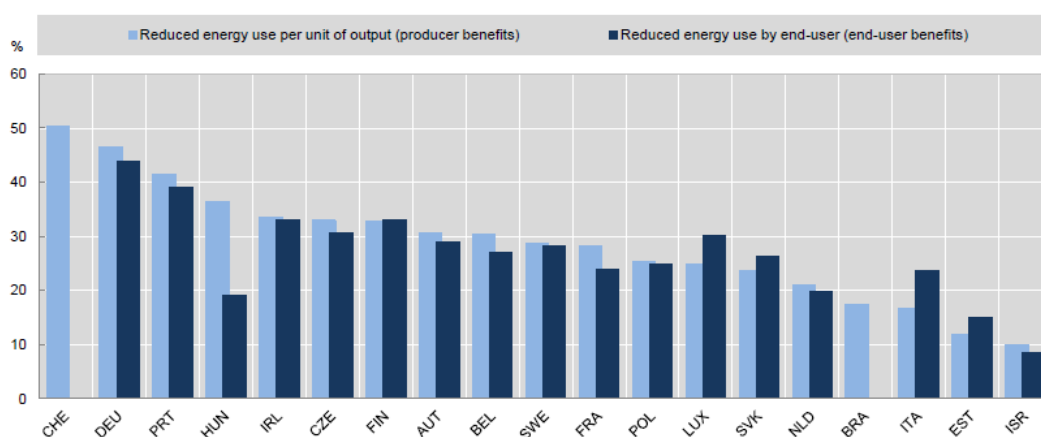
Aggregated descriptive statistics concerning the “green benefits” deriving from EIs are also offered by OECD, still based upon CIS 2008 and other national data sources. At this time, the classification differentiates between those benefits which arise for production companies and those which emerge for end-users, but the overall results are not so different from those expressed by Horbach (2014). The data, available for a sample of selected European countries, are expressed in percentages and they’re represented in the table below and in the subsequent graphic.

Table 4. Aggregated percentage of environmental benefits derived from EI across Europe

Country	Initials	Reduced energy use per unit of output (producer benefits)	Reduced energy use by end-user (end-user benefits)
Switzerland	CHE	50,4	#N/D
Germany	DEU	46,4	44,0
Portugal	PRT	41,5	39,1
Hungary	HUN	36,3	19,0
Ireland	IRL	33,5	33,1
Czech Republic	CZE	33,1	30,7
Finland	FIN	32,9	33,0
Austria	AUT	30,7	28,9
Belgium	BEL	30,3	27,0
Sweden	SWE	28,6	28,1
France	FRA	28,2	23,9
Poland	POL	25,3	24,8
Luxembourg	LUX	24,7	30,1
Slovak Republic	SVK	23,7	26,2
Netherlands	NLD	21,1	19,8
Italy	ITA	16,5	23,5
Estonia	EST	11,7	15,0

Source: OECD, 2011 based on Eurostat (CIS 2008) and national data sources

Figure 15. Aggregated eco-benefits for European countries represented through an histogram



Source: OECD, 2011

Another statistical description of the European context, is provided in the paper written by Mazzanti et al. (2014), who look at the exogenous effects deriving from the adoption of EI, by using CIS data on innovations' adoption. The authors create an interesting table (which is re-created below) which exhibits the ranking of four main European countries (Germany, France, Netherlands, Sweden and Italy) by keeping into account the overall adoption of environmental innovation measures in some different economic categories over 2006-2008 period (Mazzanti et al., 2014).

Table 5. European leaders in different productive sectors

Domain	Sector	Leader CO₂ innovat	Leader emission innovat	Leader waste reduction innovat
General	Manufacturing	Germany	Germany	Germany
General	Industry (except construction)	Germany	Germany	Germany
Services	Financial & insurance activities	Netherlands	France	France
Services	Services of the business economy	Sweden	France	France
Services	Insurance, pension funding	Sweden	Netherlands	France
ETS	Manufacture of basic metals and chemicals	Germany	Germany	Germany
ETS	Manufacture of coke & refined petroleum products	Germany	Germany	Germany
ETS	Air transport	Germany	Germany	France
Utility	Waste collection, treatment & disposal activities	Germany	Germany	France
Utility	Water collection, treatment & supply	Germany	France	France
Utility	Waste management & remediation activities	Sweden	Germany	France

Source: re-elaboration from Mazzanti et al., 2014

Looking at the ranking included in the representation above, it emerges that the leading EU country in the field of eco-innovations is Germany, whose leadership in invention in the manufacturing and industrial sector is driven by the superiority of its core industrial sectors. For what concerns service sector, evidence is even more varied, as France, Sweden and Netherlands also exhibit a very good performance. As authors state, the role of Italy is relevant in technological waste disposal adoption, even if the country shows a consistent gap concerning CO₂ innovation.

4.1.2 ECO-INNOVATION INDEX

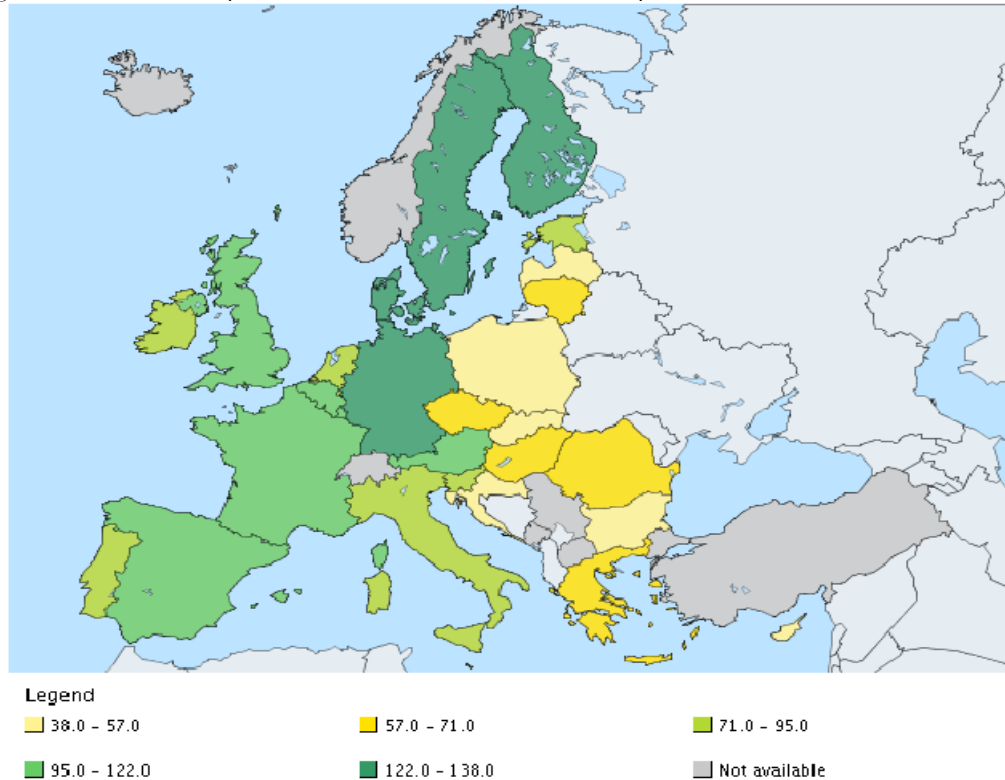
In order to provide a comprehensive and holistic overview of EIs around Europe, it is also interesting what indicated by the Eco-Innovation Index or *Eco-Innovation Scoreboard*, provided for the period 2010-2013, which shows how well, in general, European countries perform in different dimensions of EI compared to the EU average, which is equated with 100. As already outlined, the score of a single country is calculated by the un-weighted mean of 16 sub-indicators related to the five areas of eco-innovations. Countries' rank (as indicated in the following table) ranges from around 40 to around 140. In 2013, the countries with the highest indicators were again Germany (132), Sweden (138), Denmark (129) and Finland (138), while those characterized by a lower index were mostly the Eastern countries such as Latvia (52), Poland (42), Slovakia (47), Cyprus (43) and Romania (63). Considering the time period from 2010 to 2013, only a few States (e.g. UK, Luxembourg, Lithuania and France) considerably improved their ranking, while others (e.g. Bulgaria, Slovenia and Cyprus) reduced it.

Table 6. Eco-Innovation Index - *Source*: Eurostat (2013)

Eco-innovation index	2010	2011	2012	2013
Index (EU=100)				
Belgium	114	115	118	101
Bulgaria	58	67	80	38
Czech Republic	73	91	90	71
Denmark	155	138	136	129
Germany	139	123	120	132
Estonia	56	74	78	72
Ireland	101	118	113	95
Greece	55	59	67	66
Spain	101	128	118	110
France	96	99	96	108
Croatia	0	0	0	57
Italy	98	90	92	95
Cyprus	64	71	74	43
Latvia	60	77	71	52
Lithuania	45	52	53	66
Luxembourg	94	130	108	109
Hungary	70	83	73	61
Malta	66	82	72	67
Netherlands	110	109	111	91
Austria	131	125	112	106
Poland	54	50	54	42
Portugal	72	81	84	79
Romania	52	67	78	63
Slovenia	75	109	115	74
Slovakia	48	52	54	47
Finland	156	149	150	138
Sweden	128	142	134	138
United Kingdom	103	105	101	122

The Eco-Innovation Index can be also graphically represented through the use of a thematic map (reported below), which outlines how single countries performed in the eco-innovative domain with reference to the year 2013.

Figure 16. Thematic map of Eco-Innovation Index across Europe



Source: Eurostat, 2013

4.1.3 OECD STATISTICS

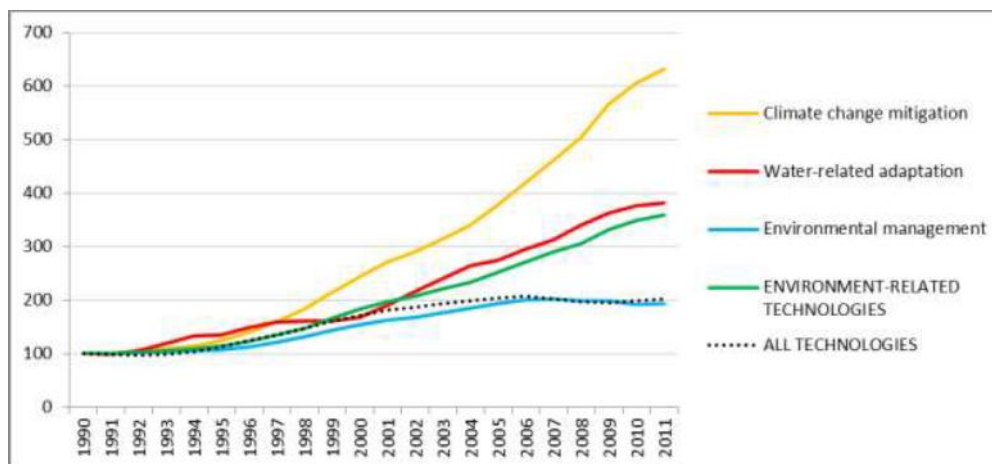
The rate of diffusion and development of EIs can be also assessed by considering indicators based on patent data in environmental-related technologies. In this regard, the statistical database of OECD offers a fundamental support, providing accurate statistics about patent-based innovations which are suitable for tracking the development path of EIs. The patent statistics are constructed using data extracted from the Worldwide Patent Statistical Database (PATSTAT) of the European Patent Office (EPO) and, as already stated, are identified using a specific classification which distinguishes patents in different sub-categories.

When dealing with EIs, it can be interesting to track the path of their diffusion worldwide over an extended period of time.

In this regard, data of OECD seem to fit with this purpose, because aggregated data can be used to graphically represent an inventive activity in the environmental domain. Figure 16, for example, represents, the evolutionary path of three broad groups of green innovations, showing that, those in the macro-field of “climate change mitigation innovations” (including technologies related to transportation, to buildings and to energy generation, transmission or distribution) increased six-fold over the period 1990-2010 and those in water-related adaptation (concerning those for water conservation and supply) almost four-fold.

On the contrary, those innovations in general environmental management (as technologies for air and water pollution abatement or those connected to waste management) increased only about as much as did innovation overall.

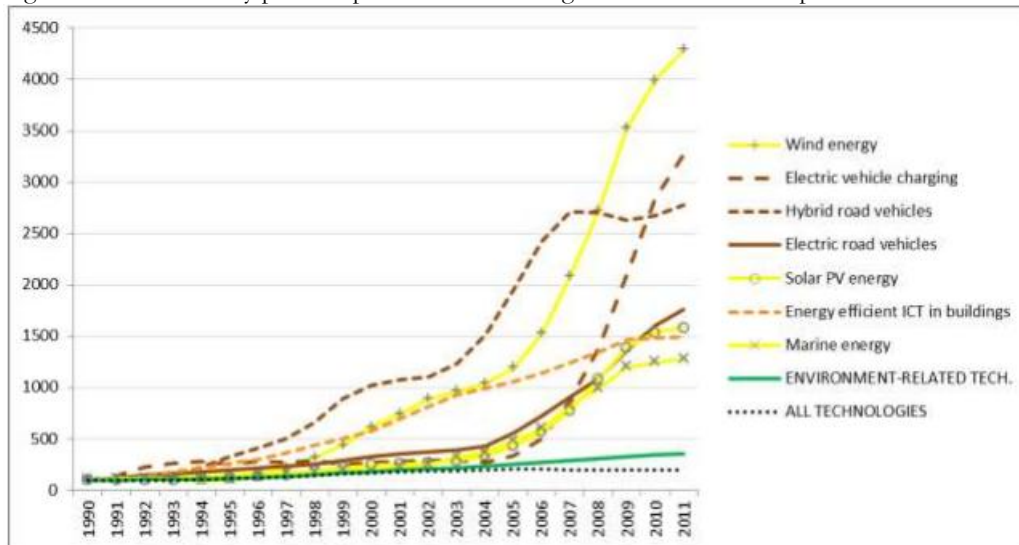
Figure 17. Evolutionary path of some green innovations worldwide for the period 1990-2011



Source: Hašič and Migotto, 2015

Another graphical representation can be done, instead, considering a more disaggregated level. Figure 17, indeed, shows that the fastest growing technologies, for the same period of time, were those related to several renewable energy generation technologies (as wind energy), electric and hybrid road vehicle technologies (as electric charging) and those related to the energy efficiency of buildings (Hašič and Migotto, 2015).

Figure 18. Evolutionary path of specific eco-technologies worldwide for the period 1990-2011



Source: Hašič and Migotto, 2015

Using OECD patent's statistics, it can also be interesting to have a look at what are the most important inventor countries in environmental related technologies globally. The assessment of green inventive activity can be done for the 2009-2011 period, as reported in table 6. What comes out is that the United States, Korea and Japan are the countries which have released the higher number of green patents worldwide. Germany and France, considering the percentage of world's total inventions, are the most innovative European countries in environmental related technologies, by positioning respectively as 4th and 6th. The aggregate data for EU (26,8%) is also significant and it demonstrates the existence of a proactive attitude of European countries towards the pursuit of a green growth, according to the objectives of Europe 20-20-20 strategy⁴⁷. However, the table also indicates that the country ranking varies somewhat depending on the "value" attributed to inventions. Indeed, considering the percentages of the world's high-value inventions, the classification changes, as Japan is ranked first and Germany as second, while United States occupy only the third position.

⁴⁷ The Europe 2020 strategy is a set of binding legislation enacted in 2009 by European institutions to ensure EU meets its climate and energy targets for the year 2020. The package sets three key targets: 20% cut in greenhouse gas emissions from 1990 levels; 20% of EU energy from renewables and 20% improvement in energy efficiency.

Table 7. Most important inventor countries globally in environmental technologies for 2009-2011

Rank	Country	% of world's inventions	% of world's high-value inventions
1	United States	21.1%	16.5% (3)
2	Korea	21.0%	9.2% (4)
3	Japan	15.5%	24.8% (1)
4	Germany	12.6%	17.9% (2)
5	China	3.9%	3.8% (6)
6	France	3.8%	5.6% (5)
7	Chinese Taipei	3.2%	3.4% (8)
8	United Kingdom	2.4%	3.6% (7)
9	Russian Federation	2.0%	0.3% (22)
10	Canada	1.6%	1.3% (10)
	EU28	26.8%	36.9%
	OECD	88.2%	90.6%
	BRIICS	6.9%	5.1%

Source: OECD, Hašič and Migotto, 2015

Another interesting statistics to deal with (still constructed upon patents) refers to the percentage of environmental-related patents for the period 1998-2000 and to the number of eco-patents released during 2008-2010 for a sample of selected OECD countries. The data for the two-year period 1998-2000 are expressed as a percentage of the total number of patents released from each country during those years, while the data for 2008-2010, instead, represent the total number of patents in environmental-related technologies, expressed in absolute value for each country. For the two-years period 1998-2000, high percentages emerge for Germany, Japan, Austria and some Scandinavian countries as Denmark and Norway, while US were not so advanced for what concerns environmental patents. On the contrary, aggregated data for UE (6%) exhibit a higher involvement of European countries compared to the rest of the world. Different is the framework for the period 2008-2010, but similar to what reported in table 6, where Japan, US and Germany are the countries with the highest number of eco-patents released.

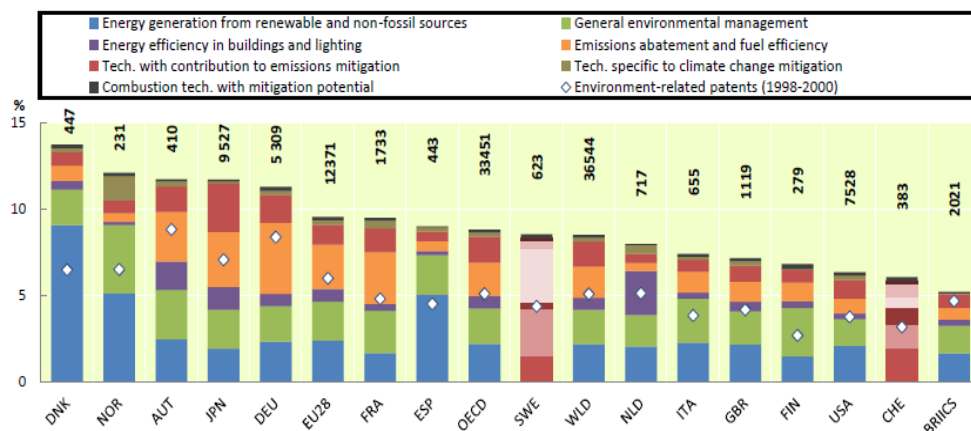
The original dataset also includes statistics about the percentage variations occurred for each single sub-category of patents, graphically represented in the following figure 19.

Table 8. Patents in environmental technologies for two periods 1990-2000 and 2008-10

Country	Initial	Environment-related patents (1998-2000)	Patents in environment related technologies, 2008-10
World	WLD	5,1	36 544
OECD	OECD	5,1	33 451
EU28	EU28	6,0	12 371
BRICS	BRICS	4,7	2 021
Denmark	DNK	6,5	447
Norway	NOR	6,5	231
Austria	AUT	8,8	410
Japan	JPN	7,0	9 527
Germany	DEU	8,4	5 309
Greece	GRC	#N/D	31
Portugal	PRT	#N/D	38
Czech Republic	CZE	#N/D	51
Poland	POL	#N/D	64
Hungary	HUN	4,2	60
France	FRA	4,8	1 733
Spain	ESP	4,5	443
Sweden	SWE	4,4	623
Netherlands	NLD	5,1	717
Italy	ITA	3,8	655
United Kingdom	GBR	4,2	1 119
Finland	FIN	2,7	279
Belgium	BEL	4,1	211
Ireland	IRL	3,6	70
United States	USA	3,7	7 528
Switzerland	CHE	3,2	383
Slovenia	SVN	#N/D	20

Source: OECD, Patent Database, June 2013

Figure 19. Patents in selected environmental technologies, 1998-2000 and 2008-2010, expressed as a percentage of total Patent Cooperation Treaty patent applications



Source: OECD, Patent Database, June 2013

These data regarding patents in environmental-related technologies show that over time, all economies considered have shown a marked increase in their propensity to implement eco-innovations. Differences exist however in the size of patent portfolio, in the share of environment-related inventions in total patents, and in the types of technologies countries are more specialized in. The US, Japan and Germany, own the largest number of eco-patents in absolute terms, and account for the majority of environmental patents filed under the PCT: more than 61% of environmental management patents, and about 54% of all energy generation patents. Therefore, once again, Germany can be defined as the dominant eco-innovative country within European borders. However, from the statistics it emerges that Denmark is the most specialized economy in eco-patents (about 14% of overall Danish patents are filed in this field), followed by Norway and Austria, all with shares above 11% of total patenting.

4.2. EMPIRICAL STRATEGY

As previously outlined, the empirical analysis contained in this section aims to analyze the economic impact of eco-innovations on firms' financial performances. The corollary argument is that the implementation of these innovative behaviors by firms can be interpreted as the existence of a certain degree of strategic CSR commitment within the business boundaries, thus a strategic responsible attitude towards environment dimension and society in general. Therefore, the contribution of this work is to empirically enhance the strand of study which links CSR to financial performances. If there is a positive statistical significance between EIs and the indicators of profitability, then it will be assumed that CSR can have a positive impact in improving financial performances of the adopting companies. However, the profitability effects of EIs are heterogeneous and the competitive gains can depend on the typology of innovation considered. Indeed, as reported inside the empirical research lead by Ghisetti and Rennings (2014), there exist both some eco-innovations which can lead to potential "win-win" situations, in which reducing the environmental impact of production contextually improves firms' economic performances, and others which, on the contrary, negatively impact firms' operating margins.

Therefore, in order to assess this relationship, it would be better to take into account a useful categorization of the different typologies of EIs, as provided by Ghisetti and Rennings (2014). On the one side there are the so-called “Energy and Resource Efficiency Innovations” (hereinafter, EREI), i.e. those innovations whose environmental benefits consist in a reduction of material and energy used per unit of output and a decline of CO₂ polluting emissions, which redesign internal production processes and services, with subsequent increases in energy and resource efficiency. On the other side there exist the so-called “Externality Reducing Innovations” (ER), i.e. those innovations aiming at reducing production externalities such as air or water pollution, which, instead, does not fundamentally alter production processes and does not modify neither firms’ internal resources nor capabilities.

Therefore, also for the purpose of the present study, it could be useful to decompose eco-innovations into these two aggregated typologies. In particular, through the means of a linear regression model, the financial impact of the first kind of aggregated eco-innovations (EREI) will be assessed, thus those related with a reduction of energy consumption and to a subsequent abatement of CO₂ emissions.

4.2.1. DATA

In order to conduct the analysis we have used two different French datasets. The first is the Community Innovation Survey (CIS 2008), which is the first survey on European scale addressing environmental innovations. The CIS 2008, as already stated, describes firms’ innovative behaviors, and aims at giving information about firms’ conduct in terms of product, process, organizational and marketing innovations for the period 2006-2008 ⁴⁸.

The survey contains an *ad-hoc* module on eco-innovations and from this dataset we have drawn the variables connected to environmental innovations.

The second dataset, instead, is elaborated by the French INSEE (Institut National de la Statistique et des Études Économiques) and contains firms’ accounting data for the year 2010 and 2011.

⁴⁸ It has to be acknowledged that the environmental benefits reported inside CIS 2008 suffer the limitation that they are self-reported, thus subjective, i.e. depending on the respondent’s perception, rather than objective, i.e. based on measurable objective indicators.

Using the same identification number for the listed companies (called “numéro SIREN”) it has been possible to merge the two datasets, finding a correspondence between the enterprises scheduled both inside CIS and inside the accounting dataset⁴⁹. The final result is an operative sample which, approximately, consists of 14,000 observations, and which is reasonably significant.

4.2.2. EMPIRICAL MODEL AND VARIABLES DESCRIPTION

The research hypothesis is based on the assumption that a particular typology of eco-innovations, namely EREI, and the existence of green behaviors within business borders, can positively affect financial performances of companies. To assess this correlation, the estimations of the model presented in the following equations will be tested:

$$(1) [\Delta OM/\Delta t]_{i, 08-10} = \alpha + \beta_1 EREI_{i, 06-08} + \beta_2 ENVIDYESM_{i, 06-08} + \beta_3 GP_{i, 06-08} + \beta_4 EMP_{i, 06} + \beta_5 AGE_{i, 08} + \beta_6 INNOACT_{i, 06-08} + \varepsilon_i$$

$$(2) [\Delta OM/\Delta t]_{i, 08-11} = \alpha + \beta_1 EREI_{i, 06-08} + \beta_2 ENVIDYESM_{i, 06-08} + \beta_3 GP_{i, 06-08} + \beta_4 EMP_{i, 06} + \beta_5 AGE_{i, 08} + \beta_6 INNOACT_{i, 06-08} + \varepsilon_i$$

The main dependent variable used for the regression analysis is firms’ profitability, represented through an appropriate profitability indicator, used as proxy for assessing firms’ financial performances. This indicator is the Return on Sales (ROS), also called “Operating Margin”, meant as pre-tax profits over sales. This measure is widely used to evaluate a company operational efficiency and it’s helpful to management because it provides insight into how much profit is being produced per dollar of sales.

The dependent variable (stOM_10 – stOM_11) has been computed with reference to year 2010 and 2011, starting from various balance-sheet data included inside INSEE database, and represents the standardize growth rate for the periods 2008-2010 and 2008-2011.

⁴⁹ It has been beneficial to merge the two different surveys, because this element has enabled us to lag the explanatory variables with respect to the dependent one.

The French INSEE database includes accounting data for a sample of more than three millions of firms, both of small, medium and large size, and it guarantees a coverage of a representative sample. Therefore our dependent variable is sufficiently reliable, because constructed upon objective data.

The independent variables, instead, are related to the firm conduct in terms of eco-innovations, and are drawn by CIS 2008. In order to assess our research question, two environmental dichotomous explanatory variables have been used.

The first is the above-mentioned EREI, which is an aggregated category of those energy, material and CO₂ innovations with high environmental benefits and which refers to the time lag 2006-2008. This aggregated variable did not originally exist inside CIS and thus we needed to construct it, by combining three different dichotomous variables, nicknamed as: *ecomat*, referring to those EIs which lead to a reduction of material use per unit of output; *ecoen*, considering EIs which lead to a reduction of energy use per unit of output and *ecoco*, so those EIs which lead to a reduction of CO₂ footprint (total CO₂) production within business boundaries. These single innovations imply a modification in firms' resource bases and capabilities and a reduction in the use of physical resources, such as raw materials and primary energy. Therefore, if a firm decides to reduce the amount of production inputs or to implement an innovation which can allow energy savings (with subsequent decreases in the level of CO₂ emissions), then there will be an improvement for what concerns its overall internal efficiency and its environmental performances.

The second explanatory variable included in the regression models is called ENVIDYESM and takes into account the existence of appropriate procedure within the company to regularly identify and reduce its global environmental impacts, implemented or significantly improved after January 2006.

This dummy variable could take value 1 if a firm put in place these procedures after January 2006, 0 otherwise. In accordance to the global purpose of the thesis work, this variable seems to be the closest one to be used as proxy indicator of CSR, because, as stated inside the questionnaire, it assesses whether an enterprise "would have procedures in place to regularly identify and reduce its environmental impacts, such as preparing environmental audits, setting environmental performances goals, or ISO 14001 certifications".

In chapter number II, we have shown how these procedures would belong to the wide realm of “instruments of CSR” (see paragraph 2.6, page 80). Therefore, it has been decided to use this variable as an indicator of the presence of a virtuous and responsible behavior of enterprises towards the natural environment.

From the description of variables, it emerges how there would be a temporal discrepancy between the dependent variable and the explanatory ones. The choice to use a dependent variable referring to two years (2010 and 2011) which differ from the one of independent variables (2006-2008), is motivated by the fact that for an enterprise, investing in a new environmental technologies or implementing an efficient EMS, is probably leading to increasing its costs in the short run, while the competitive gains may only be realized in a subsequent period. Therefore, in our case, it's appropriate to expect that the adoption of green behaviors in 2006-2008 period may endanger profitability gains or losses after a certain time lag. The merge of these two surveys allows overcoming those problems deriving from the simultaneity between the dependent variable and the explanatory ones, and the possible reverse causality issue.

In order to be more precise, this merge between the two dataset allows to model the average operating margins for two periods (2008-2010 and 2008-2011), on a set of explanatory variables all referred to the time lag 2006-2008. Doing like this, we let environmental innovations (and green-sustainable attitudes) introduced in the time lag 2006-2008 to start having profitability gains from 1 to 3 years later, i.e. in 2010-2011. This choice is supported by previous findings (e.g. Ghisetti and Rennings, 2014) which show that a profitability's indicator as OM, requires two or three years to be affected by improved environmental performances, but its effects start being no longer significant after the third year of lag.

Inside the regression, several control variables, indicated by the literature to be correlated with the dependent variable, have been included. According to various studies, several factors can influence the overall financial firms' performance⁵⁰. Between the variables that may influence firms' heterogeneous profitability, it is possible to include:

- *Belonging to a group* (GP): among the control variables affecting firms' financial performances, it could be useful to take into account if a firm belongs to a group or not. This variable is a dummy, which can take value 1, if the firm belongs to an industrial group or to a cluster of firms, and 0 if not;
- *Number of employees* (EMP): this variable measures the rate of employees for each enterprise in 2006, using data furnished by CIS 2008. Starting from the assumption that the size of the firm is an important factor in affecting its financial performance, it's supposed that a higher number of employees in the considered period, can influence its final profitability;
- *Firm age* (AGE): it is computed as the overall period from the year of establishment of the enterprise up to 2008. The results of different empirical studies, with regard to the influence that the age of a firm can have on its profitability, are mixed: some of them (e.g. Margaretha and Supartika, 2016) indicate that there is a negative and no significant correlation between firm age and profitability, due to the fact that older firms might have developed routines which are out of touch with changes in market conditions. Other studies, instead, affirm that older firms may also benefit from some reputation effects, which allow them to earn a higher margin on sales;
- INNOACT: it is a dummy variable which measures the innovative nature of an enterprise in a technological sense.

⁵⁰ Inside the regression, it have been included also some control variables related to the belonging region of the enterprises and to the differences between productive sectors. For reasons of simplicity and brevity, it has been decided to not report those variables inside the following tables, but it has to be acknowledge that the final results may be also influenced by their effects.

Table 9. Table of descriptive statistics

variables	N	max	min	mean	sd	skewness	kurtosis
OM_11	18743	229083.8	-624.4374	15.50172	1728.238	126.3784	16541.38
OM_10	19318	92.58508	-1278.075	-.1301047	10.63866	-100.4392	11283.94
stOM_11	18709	71.54742	-116.5129	-2.56e-10	1	-64.97304	11252.07
stOM_10	19288	138.7681	-.9824302	-3.19e-10	1	138.5597	19227.26
GP	19708	1	0	.4488025	.4973845	.205872	1.042383
EMP	19708	12.03402	0	3.807482	1.452251	.9650693	4.083271
AGE	19706	4.70048	.6931472	2.994257	.7178307	-.2087665	2.992989
INNOACT	19708	1	0	.3641668	.481208	.5645651	1.318734
ENVIDYESM	19708	1	0	.1060483	.3079072	2.558963	7.548294
EREI	19708	1	0	.207	.406	1.434	3.055

Table 10. List of variables used in the regressions

Acronyms	Definition of variables
stOM_10	Standardized average growth rates for the period 2008-2010
stOM_11	Standardized average growth rates n for the period 2008-2011
EREI	Energy, Material and CO ₂ reduction process innovations with high environmental benefits related to period 2006-2008
ENVIDYESM	Disposal of procedures to measure and reduce the environmental impact implemented after January 2006
GP	Belonging to a group of enterprises
EMP	Number of employees per enterprise in 2006
AGE	Age of the enterprises (in 2008)
INNOACT	Innovative enterprise in a technological sense

4.2.3. METHODOLOGY

From equations 1 and 2, it emerges how it has been decided to use a model of multiple linear regression to investigate the relationship between our response variable and the explanatory ones. Indeed, a multiple regression analysis is very useful for our purposes, because there is not a single explanatory factor that may have a systematic effect on the average growth rate, but, on the contrary, we want to assess the effect of two different independent variables, EREI and ENVIDYESM.

From a theoretical point of view, this model can be written as:

$$(3) \quad y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \varepsilon(1)$$

or generalized to the case of k regressors as:

$$(4) \quad y = \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + \varepsilon(1)$$

A multiple regression model assumes that the relationships between the dependent variable y_i and the p -vector of regressors x_i is linear. This relationship is modeled through a disturbance term of error, which is the variable ε , an observed random variable that adds noise to the linear relationship under investigation. In both expressions, each of the β slope coefficients are the partial derivatives of y , with respect to the x variable which they multiply, holding all other x 's constants (*ceteris paribus*). For example, holding x_2 fixed, then $\beta_1 = \partial y / \partial x_1$. The key assumption for the model involves the independence of the error process ε and both regressors, or explanatory variables. The ε term is a non systematic part of y , not linearly related to any of the x 's. Therefore it is possible to write that $E(\varepsilon | x_1, x_2 \dots x_k) = 0$.

The method used for estimating the unknown parameters β in the multiple linear regression is the Ordinary Least Square (OLS). This method has the goal of minimizing the differences between the observed responses and those predicted by the linear approximation of the data. In this case, the regression coefficients are considered in a *ceteris paribus* sense: each coefficient measures the partial effect of a unit of change in its regressors, holding all other variables fixed.

For a multiple linear regression, the estimated OLS equation contains the parameters of interest: $\hat{y} = b_0 + b_1x_{i1} + b_2x_{i2} + \dots + b_kx_{ik}$ and it's possible to define the OLS criterion in terms of its residuals, from this expression:

$$(5) \min S = \sum (y_i - b_0 - b_1x_{i1} - b_2x_{i2} - b_kx_{ik})$$

The minimization of this expression is performed with respect to the (k+1) parameters, $\{b_0, b_1, b_2, \dots, b_k\}$. For this to be feasible, $n > (k + 1)$: that is, it's important to have a sample larger than the number of parameters to be estimated from that sample. The minimization is carried out by differentiating the scalar S with respect to each of the b 's in turn, and setting the resulting first order condition to zero. This gives rise to (k+1) simultaneous equations in (k+1) unknowns, the regression parameters, which are known as the least squares normal equations, and which are expressions in the sums of squares and cross product of the y and the regressors, multiplying the constant term.

These, can be uniquely solved, for the estimated least squares parameters.

Moreover, in the context of multiple regression, with several regressors, we have to make additional assumptions about their measured value. The first proposition is that none of the explanatory variables x may be expressed as an exact linear relation of the others (thus that the regressors are exogenous). The second one, instead, states that there is no perfect collinearity, or multicollinearity, in the analyzed sample. If we would have a perfect collinearity in the regressor matrix, the OLS estimates can't be computed.

4.2.4. RESULTS

In the following section the results of the regressions will be presented. Estimation results of equations 1 and 2 are provided in table 9 and table 10.

The former uses a dependent variable with a reference year corresponding to 2010. The latter instead involves a dependent variable with a reference year coinciding with 2011.

Table 11. Estimation results with reference to year 2010

	(1) stOM_10	(2) stOM_10	(3) stOM_10
EREI	0.1053** (0.0364)	0.1116** (0.0363)	
ENVIDYESM	0.0697** (0.0336)		0.0778** (0.0335)
GP	-0.0105 (0.0229)	-0.0075 (0.0229)	-0.0091 (0.0229)
EMP	0.0086 (0.0091)	0.0112 (0.0090)	0.0093 (0.0091)
AGE	-0.0114 (0.0149)	-0.0116 (0.0149)	-0.0113 (0.0149)
INNOACT	-0.0004 (0.0228)	0.0081 (0.0225)	0.0104 (0.0225)
_cons	-0.0922 (0.8506)	-0.0819 (0.8507)	-0.1061 (0.8508)
<i>N</i>	14424	14424	14424
pseudo R^2			
<i>AIC</i>	45262.178	45264.5068	45268.574
<i>BIC</i>	45989.536	45984.2884	45988.355

Table 12. Estimation results with reference to year 2011

	(1) stOM_11	(2) stOM_11	(3) stOM_11
EREI	0.0578 (0.0364)	0.0626* (0.0363)	
ENVYDESM	0.0530 (0.0338)		0.0575* (0.0337)
GP	-0.0210 (0.0231)	-0.0186 (0.0231)	-0.0203 (0.0231)
EMP	-0.0058 (0.0091)	-0.0039 (0.0091)	-0.0054 (0.0091)
AGE	-0.0297** (0.0150)	-0.0300** (0.0150)	-0.0295** (0.0150)
INNOACT	0.0323 (0.0229)	0.0387* (0.0226)	0.0382* (0.0226)
_cons	0.0473 (0.8465)	0.0543 (0.8465)	0.0385 (0.8465)
<i>N</i>	14124	14124	14124
pseudo <i>R</i> ²			
<i>AIC</i>	44182.2190	44182.6910	44182.7568
<i>BIC</i>	44900.0039	44892.9203	44892.9861

Analyzing the estimations resulting from the linear regressions abovementioned, it is possible to notice how both for 2010 and 2011, the explanatory variables confirm the underlying hypothesis. Both EREI and ENVIDYESM are positive and significant, even if with a strong significant effect on firms' profitability for the year 2010. For 2011, the effect is low, and this can be ascribed to the fact that, as outlined by Ghisetti and Rennings (2014), the operating margin requires one or two years to be affected by environmental performances, but this effect starts to be no longer significant after the third year of lag.

However, generally speaking, the expectation that increased resource efficiency engenders a positive economic effect is confirmed. EREI are those innovations that in reducing the use of raw materials and energy (with the subsequent reduction of CO₂) emissions, they also lead to a reduction of production costs. Therefore, EREI positively affect firms' profitability, as they can lead to a "win-win" situation in which the improvements of environmental performances lead also to economic gains.

Also the second independent variable, namely ENVIDYESM, is found to be positive and statistically significant in affecting firms' profitability. Once again, this effect is stronger for the average operating margin 2008-2010, while it's diminishing with reference to 2011. This can be ascribable to the fact that a firm which introduces internal procedures for diminishing its environmental impacts, will increase its competitiveness with higher financial returns on a short period of time. Indeed, the introduction of an efficient strategy of CER (or CSR) in one company may endanger a "first mover" competitive advantage, when compared to firms that will introduce such practices only in a further period. However, after few years this effect can slow down due to the presence of external competitors which can imitate and replicate, as well, those responsible and winning practices.

This last result is particularly important for the global purpose of the analysis because it confirms what previously stated from a theoretical point of view: the implementation of responsible practices related to the environment, linked to the adoption of eco-innovations aiming at diminishing the damaging impacts of production activities, can enhance economic competitiveness of enterprises.

Finally, it is also interesting to assess the fit of the two models and comparing them by looking at the two information measures reported in the results: the AIC (Akaike's Information Criterion) and the BIC (Bayesian Information Criterion) statistics.

The theory suggests that the model with the smaller AIC and BIC is considered the better fitting model. Therefore, by considering the values indicated in the tables above, it can be stated that the model with reference to year 2011 is preferred with respect to the first, because it presents the smallest AIC and BIC values.

CONCLUSIONS

As mentioned in the previous chapters, in an age of globalization and tension toward a low-carbon green economy, an increasing number of companies worldwide is paying a great deal of attention to the paradigm of Corporate Social Responsibility, which is becoming more and more integrated to the “mantra” of sustainable development. Indeed, more than ever, businesses are required to radical rethink their corporate behaviors in a “greener” and “fairer” manner, and thus the actualization of voluntary corporate responsible practices could be considered as the key engine to accomplish this fundamental task.

As highlighted, CSR represents one of the main driver of “corporate sustainability”, that is the capability of an enterprise to generate long-term and shared value, through mutually beneficial relationships with the entire network of stakeholders and the overall society. CSR, while ensuring a progressive alignment of shareholders’ and stakeholders’ interests, can be strategically used by a company in order to achieve a sustainable growth and address some societal and environmental needs. Therefore, in recent years, CSR has progressively gone deeper within the business strategy of many realities and it has been “embedded” in the business, starting to influence decision-makers on everything, from corporate mission to long-term strategy. In this respect, many enterprises, in order to demonstrate their CSR commitment, have started to apply tighter codes of practices across their supply chains, to activate management functions expressly dedicated to corporate responsibility and to disclose environmental and social information through reports, while governments have started to enact legislations in order to pave the way for the diffusion of responsible practices. Enterprises, started to perceive environmental and social obligations not only as expensive burdens, but also as strategic business levers, as powerful economic factors able to affect their sustainable prosperity while inducing deep transformations in their internal organization and in the production processes.

Therefore, nowadays, it's possible to affirm that a "sustainable and responsible" oriented company is the one which: considers its economic and competitive success, the social legitimacy and the environmental dimension, as interconnected, according to a synergetic and circular view of the company's aims; is able to identify, measure, and report the social, environmental and economic effects of its operations on society at large; is fully aware of its responsibilities towards the social context and thus which satisfies the critical instance coming from stakeholders; adopts some of the tools and methods, functional to the improvement of its social, ecological and financial performances.

In a context of extreme competitiveness on global markets, CSR plays a crucial role both in the enhancement of firms' economic competitiveness, and in the improvement of the overall social welfare at large. Therefore, CSR can be considered as one of the cards which can be played in order to relaunch the stagnant competitive capacity of a national economic system.

Nevertheless, CSR is a multidimensional concept which is "elusive, malleable and blurry", and which does not fit the same for all companies and for all countries. Therefore, the adoption of a CSR program should be patterned depending on the specific features and characteristics of the adopting firm, rooted within corporate structure and shaped according to the specificities of the company's strategy. In this respect, CSR may involve a remarkable competitive advantage and may have significant benefits on firms' performances. Firstly, CSR activities can contribute to enhance company's intangible assets, based on knowledge and trust (thus improving firms' legitimization, external image or reputation). Secondly, an all-persuasive CSR can constitute a tremendous source for the economic growth of a company, able to strengthen its financial competitiveness especially on the long run, by replacing some obsolete business practices, enabling the restructuring of its value chain in a sustainable manner or allowing those systemic internal changes, essential for the improvement of the sustainability of the production processes.

Of course, in many aspects, CSR is a matter of trade-offs, just like all the other disciplines on business management, and thus its implementation could be viewed as a further financial burden to be borne.

This can be true especially for Small and Medium Enterprises, which can encounter difficulties in adopting a long-term strategy of CSR, due to financial or logistic constraints. Indeed, while the majority of the largest firms publishes annual sustainability reports or it is certified with different ISO standards, the smaller companies still encounter difficulties in adopting a coherent CSR program, maybe because managers still ignore the benefits CSR can bring on the long-run. The problem is that many companies lack the knowledge and competencies to redesign their internal operations, products and services in a way that will reduce, for example, their environmental impact and bring economic benefits to both the producer and the end-user. Therefore, more than ever, it is required that national governments would encourage firms to voluntarily adopt CSR initiatives, thus reinforcing a culture of responsibility, and this objective could be effectively achieved through the use of incentive systems which would reward the responsible companies on the market. However, what could also contribute to furthering the adoption of CSR among businesses, is the building of a solid body of empirical evidence which would highlight the several benefits that may arise from CSR and which would standardize responsible practices (e.g. labels, marks, certificates, ratings) with clearer and more rigorous boundaries.

Another important aspect which has been underlined in these pages, is that a well-implemented strategy of CSR can serve as a potential framework in which innovations, in general, can be identified and then exploited to the company's advantage. It seems to exist, indeed, a "virtuous circle" between the implementation of an advanced CSR strategy and the subsequent adoption of innovations by the enterprises. CSR, due to the fact that it can offer to business a stable and less risky framework where to act, could constitute the gateway to the adoption of more innovative behaviors and breakthrough solutions, laying the foundations for a forward-looking and anticipatory mindset within business boundaries. More specifically, this statement seems to be true for what concerns the realm of the so-called environment-related innovations or eco-innovations.

The “green awakening”, introduced through CSR, is, indeed, able to activate those entrepreneurship policies that would attribute an increasing relevance to firms’ environmental and social performances, thus leading them to increasing investments in “environmental” R&D (Ghisetti and Quatraro, 2013).

In this respect, CSR can be considered as a stabilizing factor in which green eco-friendly technologies can be identified and then exploited to the companies’ advantage. Moreover CSR can stimulate businesses creativity, offering them the opportunities to build up new internal competences in some green technological activities and to re-organize in a proper way their relationships among business units and with the stakeholders of interaction. Therefore, while enabling enterprise to redesign products and processes along the entire value chain in a more sustainable and greener manner, CSR can also leverage the crucial systemic changes that are needed for sustainable progresses and produce more business opportunities for the competitive advantages. Indeed, as firms adopt new methods to reduce pollution and detecting all the resource-use inefficiencies, then they can obtain consistent cost-savings and monetary gains.

The economics effects of CSR and eco-innovations on firms’ financial performances have been investigated in the last chapter of the work, using a significant sample of approximately 14,000 French companies. Notwithstanding all the methodological difficulties to create a proper regression model, finally the results of the empirical work have established the existence of a significant and positive relationship between CSR, EIs and firms’ profitability. Using the average operating margin for two distinct periods (2008-2010 and 2008-2011) as dependent variable and two indicators (ENVIDYESM and EREI) as independent variables, the estimation results have confirmed this linkage, even if with less significance for the year 2011. These outcomes can be interpreted in two ways: on the one hand, CSR (related to the environmental dimension), while contributing to the increase of companies’ intangible asset of knowledge and trust, can then support that process of value creation and enhance financial performances; on the other hand, those innovations which lead to a reduction in the use of raw materials and energy per unit of output (EREI) can provide consistent monetary savings with subsequent economic gains.

Therefore CSR (and EIs) is not, as some claims, just a luxury implemented by a small portion of rich companies or a subversive doctrine aimed at “threatening the foundations of societies” but, in a long-term competitive scenario, it can be able to generate increased profits and create positive externalities for the society in which the business is inserted, thus contributing to the pursuit of Shared Value construction, as suggested by Porter and Kramer (2006; 2011). More specifically, in a context of sluggish economic growth characterized by climate change challenges, the adoption of a systemic approach toward responsible business and eco-innovation is, by now, a necessity rather than an exception.

Indeed, in order to guarantee a larger systemic shift towards more sustainable social and economic systems, it is fundamental for business to progressively change those non-sustainable attitudes and embrace a more socially and environmentally responsible viewpoint. Businesses in order to strengthen their market position and to “stay in the game” have to continuously rethink their management model, focusing on improving production processes and reconfiguring their organizational structure in a “green way”. In short, companies have to assimilate sustainability into the logic of their business model design.

However, CSR, even if strongly implicated in this “changed world”, is not the only desirable solution, because managers of business organizations are relatively powerless against the powerful market forces and the scale of global problems is too big to be faced only with “responsible actions”. In this respect, it is essential that during the phase of transition towards a low-carbon economic system, the innovative business activities would be accompanied, hand in hand, with the massive adoption of green-friendly technologies which could manage to slow down climate damages and allow a moving away from the dangerous *business as usual* scenario. This large systemic shift towards integrated sustainability can be achieved, only if the whole society would dispose of new ways and technological green methods to accomplish its functions and to face major environmental and economic challenges. Therefore, CSR and EIs, if combined together, seem to succeed in accomplishing this primary task, essential for the resilience of global socio-economic system.

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