UNIVERSIDAD DE SALAMANCA

DEPARTAMENTO DE ADMINISTRACIÓN Y ECONOMIA DE LA EMPRESA

TESIS DOCTORAL

VNiVERSiDAD
D SALAMANCA

TÍTULO**:**

THE RELATIONSHIP BETWEEN RESEARCH & DEVELOPMENT INTENSITY AND CORPORATE SOCIAL RESPONSIBILITY

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Salamanca, 2011

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Fdo.: José Ignacio Galán Zazo.

Acknowledgements

This thesis is dedicated specially to God, since without him nothing is possible. He placed the right people in my path, where I found support throughout the doctoral program. In the next lines, I would like to make a special mention to some of these persons.

I would like to thank the director of this thesis PhD José Ignacio Galán Zazo for his teachings and support. I also thank to the professors and colleagues at the Business Administration department who have encouraged and helped me all of these years.

Furthermore, I would like to thank the Spanish Ministry of Education and Science-FEDER (Project ECO2010-21473), the Ibero-American Chair in Management and Corporate Social Responsibility/Santander Bank for their financial support for this research.

Finally, I am especially grateful to my family, my father, mother, sister, and grandparents, for supporting and encouraging me to continue graduate school abroad. Foremost I would also like to thank my wife Rosa, her love and support made this project a success.

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CHAPTER 1

INTRODUCTION

This first chapter is purely introductory, with the purpose of stating the main objective of this doctoral thesis entitled: **"**The Relationship between Research & Development Intensity and Corporate Social Responsibility". The title clearly states that this thesis wants to broaden the understanding of the relationship between these two factors and how they can impact on organizational performance.

On the following paragraphs, it will be detailed how the main objective of the thesis was achieved, summarizing several empirical researches carried out in order to provide insight of the relationship between research & development and corporate social responsibility. In this introduction the structure of the thesis and the database used for obtaining the variables of corporate social responsibility and organizational performance will be described.

1. – AIMS OF THE THESIS

Corporate social responsibility (CSR) has been the focus of significant attention by a proliferation of conceptual and empirical work (see Carroll and Shabana, 2010; Lee, 2008; Margolis and Wash, 2003; Orlitzky et al., 2003; Windson, 2000; Wood 1991; 2010). Over the past two decades, the literature has paid particular attention to the relationships between CSR and financial performance, albeit with mixed results and no clear understanding due the difficulty in measuring CSR accurately and also the significance of its on organizational effectiveness (McWilliams et al., 2006). Existing studies of the interaction between CSR and

financial performance suffer from several important theoretical and empirical limitations. One major concern is that these studies sometimes use models that are misspecified because these studies have omitted variables that have been shown to be important determinants of profitability. One such variable is the intensity of research & development (R&D) investment by the firm (McWilliams and Siegel, 2000).

Within this context, this thesis tries to answers some questions that at this point in time have no consensual response on CSR literature, focusing on the comprehension of the relationship between CSR and R&D. There have been several studies that have stated that R&D should be included in CSR models such as McWilliams and Siegel, 2000 and Hull and Rothenberg, 2008, who studied the effect that CSR has on corporate financial performance. But to our knowledge there have been no researches that have focused specifically in understanding the relationship between these two variables. Each chapter in this thesis approaches one aspect of this relationship and how it can affect the organizational performance of the firm. First by analyzing the effect that R&D intensity has on CSR, then by studying how different types of R&D that produce social benefits can affect financial performance, and finally how R&D intensity can affect a firm's reputation only when the R&D activities are related with CSR activities.

On chapter 2, the aim of the research was centered on giving insight and fulfilling a gap in the literature of how R&D intensity can affect CSR. Both CSR and R&D are intangible resources that are difficult to imitate and valuable, for which can help a firm obtain a competitive advantage. Furthermore, both R&D intensity and CSR can be perceived as investments for product differentiation, depending on the industry the firm is in, stakeholder pressures, government regulations, and the desire that firms have to be socially responsible.

These resources are very important for firms, and thus this researched aimed to find and identify opportunities that firms have in investing in both of these resources. For example firms, may find the opportunity to take advantage of CSR activities in current R&D processes, reducing costs effectively and satisfying stakeholder pressures. Since, R&D intensity varies across industries; the research was extended to analyze this effect in two scenarios: manufacturing industries and non-manufacturing industries. Due to the fact that R&D and CSR are valuable intangible resources, the resource-based view theory (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984) was used as a theoretical framework for this research.

Chapter 3 has the objective of studying the effect that innovation with high social benefit has on financial performance. Innovation with high social benefit involves R&D activities that provide society with different kinds of benefits, and we studied how these activities impact on a firm's financial performance. For this research, the theoretical framework is a combination of theories: the resource based view and institutional theory. The resource-based view theory supports the intentions of firms to incur in R&D activities because innovation will create a differentiation which will lead the company to a competitive advantage. In addition, the institutional theory supports the intentions of the firm to participate in R&D activities because the firm will acquire legitimacy when it attends to stakeholder pressures that call for innovation. To our knowledge there is no other research that has studied this effect, and for this reason, this study is relevant because it will open the possibility of understanding how CSR and R&D combined can help a firm's financial situation. Furthermore, we extend this research by analyzing the effect of being an innovation leader has on financial performance in order to establish a comparison between two innovation strategies.

Since financial performance is a short term indicator of organizational performance, it was thought necessary to introduce a research question that involved the use of a long term indicator of organizational performance such as corporate reputation. In line with the results and conclusions of the empirical research of chapter 3, chapter 4's research has the aim of studying the effect that R&D intensity has on corporate reputation and how innovation with social benefit can moderate this effect. The main goal of the research was to determine if R&D by itself could create a positive reputation and also to determine if innovation with social benefit would make this effect more intense. Since, innovation with social benefit would produce positive externalities that are perceived by their stakeholders and thus improve the firm's legitimacy.

2. – THESIS ORGANIZATION

Chapter 2 examines the impact that R&D intensity has on CSR. At the beginning of the chapter an introduction to the topic is made, letting the reader know about the importance of the subject and why it is an interesting research topic. Then a theoretical section is included in order to reinforce the empirical research. We used as the theoretical framework, the resource-based view theory, because contributes to the analysis of intangible resources such as R&D intensity and CSR. After the theoretical background has been established, the hypotheses are stated. The first one being, the effect of R&D intensity positively affects CSR. Since it has been demonstrated that the industry factor is determinant when analyzing any of these variables, the second hypothesis states that R&D intensity positively affects CSR with more intensity in manufacturing industries than in non-manufacturing industries. The hypotheses are followed by the data and methodology section, where the data and methods used to verify these hypotheses

are described. Consequently, the results sections show that R&D intensity positively affects CSR and that this relationship is significant in manufacturing industries, while a non-significant result was obtained in non-manufacturing industries. The chapter finishes with the discussion and conclusion section, where the results are discussed and future research questions are established.

Since there are different types of R&D activities, it was necessary to study other specific kinds of innovation. Because of the CSR focus of this thesis, it chosen to study the effect of a special kind of innovation, one that has social benefits as an end product and how this social innovation can affect the financial performance of a firm, and in chapter 3 this effect is analyzed. Chapter 3 as well as chapter 2 starts with an introduction to the topic and explains to the reader why this research is interesting, mentioning previous studies and how some questions have been left unanswered. Due to this gap, the here research intends to give insight about which innovation strategy impacts with more intensity on financial performance. To support this analysis a theoretical section is included, where the resource-based view and the institutional theory are used as the theoretical framework. The section is followed by the methodology used, where the panel data technique is described, as well as the sample used, which contained 2025 observations for 418 firms. Then the results are for the research are stated, where it is demonstrated that there is a negative and significant effect between innovation with high social benefit and financial performance, highlighting the importance of the involvement of governmental and non-governmental institutions to create an incentive for firms to incur in innovative activities that produce social benefits. Finally a conclusion and discussion section is presented, where it is exposed that even though there was a negative effect between innovation with high social benefit and financial performance, we believe this type of innovations creates legitimacy, because firms are fulfilling stakeholder expectations. This

conclusion leads us to the fourth chapter, where we study the effect that innovation with high social benefit has on R&D and corporate reputation.

Chapter 4 shares the same organization as the other chapters. It begins with an introduction placing the reader in context of this research, which analyzes the effect that R&D intensity has on corporate reputation and how this effect can be positively moderated when innovation yields some kind of social benefit. The introduction is followed by the theoretical background section, where the theoretical framework used is described. As well as in chapter 3, in this research the resource based view and the institutional theories are used. The theoretical section is followed by the methodology and data section, where the variables are described. The results for this research confirm the moderating effect of the hypothesis and give insights about how firms can improve their reputation through R&D activities related with social innovations, since R&D alone may not have a positive influence on corporate reputation, but when a firm's R&D activities generate social benefits, then the firms' reputation will be positively affected. Finally the conclusion section discusses the results obtained in the research.

Table 1 - Major issues addressed per chapter

Chapter	Motivation/Objective	Contributions
2	• Models that try to explain the relationship between CSR and corporate financial performance are misspecified because of the omission of certain variables, such as R&D intensity. • Lack of understanding in previous literature about the effect that R&D has on CSR	• R&D intensity has a positive effect on CSR • How this effect behaves in different industries: manufacturing and non-manufacturing.
3	• There is a lack of knowledge about the effect that innovation with high social benefits has on financial performance. • Determine if being an innovation leader is a better strategy than producing social benefits from innovation.	• There was a negative effect between innovation with high social benefit and financial performance. • Reinforce the results from other studies that have stated that being an innovation leader positively affects the financial performance of firms.
4	• Understand the effect that R&D intensity has on corporate reputation. • Determine if innovation with high social benefit has a moderating effect on the impact that R&D intensity has on corporate reputation.	• Research provides insights about how firms can improve their reputation through R&D activities related with social innovations • R&D investment alone may not have a positive influence on corporate reputation

3. – CORPORATE SOCIAL RESPONSIBILITY DATABASE

According to Marlogis et al. (2007) meta-analyses results, corporate social responsibility impacts on a firm's financial performance depending "on big scale" on the data types used to measure corporate social responsibility. The last cited authors classified the different ways to capture companies' corporate social responsibility, and asserted that the most used resource on the literature is, called, third-party audits - which's involves the systematic assessment of data by investigators who evaluate a company along a set of criteria. The most common resource example is Kinder Lydenberg Domini (KLD) database, following by its precursor developed by the Council on Economic Priorities (CEP) and equivalent organizations in other countries, example: Canadian Social Investment Database (CSID) – Canada; Sustainalytics Platform database (before the year 2009 known as SiRi Pro) – Europe, North America and Australia; Ethical Investment Research Service (EIRIS) – United Kingdom.

This thesis adopted the KLD database that is according to Márquez and Fombrun (2005) in many respects the best instrument currently available for measuring the corporate social responsibility of American firms. There is a lot of peer-reviewed articles, representing a variety of academic fields (including finance, economics, management and sociology) have used KLD data to research companies' social, environmental and governance performance (KLD, 2008). Some of these articles are: Agle et al. (1999), Berman et al. (1999), Coombs and Gilley (2008), Garcia-Castro et al. (2010), Griffin and Mahon (1997), Godfrey et al. (2009), Hillman and Keim, (2001), Kacperczyk (2009), Liston-Heyes and Ceton (2009), Mattingly and Berman (2006); McWilliams and Siegel (2000), Nelling and Webb (2009), Ruf et al. (2001), Waddock and Graves (1997), Wagner (2010).

These last cited articles and others empirical studies used interchangeably the terms corporate social performance and corporate social responsibility (Margolis et al., 2007) - or "socially responsible behavior" and recently "corporate responsibility. Theorists attempt to distinguish corporate social performance from corporate social responsibility, although sometimes subsuming corporate social performance under the umbrella of corporate social responsibility and sometimes the reverse (Margolis et al., 2007). This thesis adopted the both concepts, without conflict, since the data used on the empirical analyses can be classify as corporate social responsibility data or corporate social performance data dependent of the theory argument adopted.

In addition, according to Brammer and Millington (2008), how to measure corporate social responsibility is one of the main difficulties for the researchers, since different aspects of corporate social responsibility may expect to be differently motivated and may accordingly have diverse implications for organization performance. Thus, in this thesis the KLD data was measured according to the characteristics of each one of the empirical analyses proposed.

The KLD Statistical Tool for Analyzing Trends in Social and Environmental Performance (STATS) is rated by KLD Research & Analytics, Inc. For each year beginning with 1991, KLD STATS provides a table of data with a collection of approximately 650 companies that comprise the Domini 400 Social SM Index and S&P 500® with one record for each company. Beginning in 2001, KLD expanded its coverage universe to include the largest 1000 US companies by market capitalization. In 2003, KLD expanded that coverage to the largest 3000 US companies by market capitalization.

KLD covers approximately 80 indicators in seven major qualitative issue areas including community, corporate governance, diversity (to proxy for minorities), the natural

environment, human rights, employee relations and product quality (to proxy for customers). In addition to this, KLD also provides exclusionary screening information for involvement in the following controversial business issues: alcohol, gambling, firearms, military, nuclear power, and tobacco. The qualitative indicators include both positive and negative ratings (strengths and concerns), while the controversial business indicators include negative ratings only.

KLD's data set is designed as a binary system. For each strength or concern, rating 1 indicates the presence of that rating and 0 indicates its absence. In the appendix A, we list all the KLD indicator variables used on this thesis and categorize them in their corresponding issue areas.

CHAPTER 2

THE EFFECT OF R&D INTENSITY ON CORPORATE SOCIAL RESPONSIBILITY

1. – INTRODUCTION

The importance of corporate social responsibility in managerial practice worldwide has encouraged academics to study its effects and how firms can or cannot obtain benefits from CSR practices. There has been a growing number of publications that study CSR, with mixed results and no clear understanding due to the vagueness and intangibility of the term (Frankental, 2001). Moreover, there are numerous definitions of CSR and often no clear definition is given in the studies, making theoretical development and measurement difficult (McWilliams, Siegel and Wright, 2006).

Another reason for the difficulty in measuring CSR is that the behaviours involved occur across a wide range of industries with significantly different characteristics, backgrounds, and performances in the different CSR domains (Graves and Waddock, 1994; Waddock and Graves; 1997). Thus, the difficulty of conducting research in the field of CSR is compounded and heightened by both its complexity and the fact that compared to other business functions its appearance as a legitimate area of enquiry in management literature is very recent (Harrison and Freeman, 1999).

This research builds on recent and very important studies that have investigated the relationship between CSR and the financial performance of firms. One of the most important

findings helping researchers to measure this relationship accurately was reported by McWilliams and Siegel (2000), who proved that CSR is positively correlated with R&D intensity. Other research that corroborates this finding is the study conducted by Hull and Rothenberg (2008). We aim to study the impact of R&D on CSR closely to determine and explain the behaviour of this effect in order to provide insight for those who want to continue studying the relationship between CSR and financial performance, including R&D as a necessary variable in their models.

Previous studies, such as those by Berrone, Surroca and Tribo (2007), Bouquet and Deutsch (2008), Hull and Rothenberg (2008), McWilliams and Siegel (2000, 2001), and Prior, Surroca and Tribo (2008), have discovered that these variables are correlated when studying the impact of CSR and another variable. However, none of these researches have studied the direct impact of R&D on CSR, so we considered it necessary to study this effect in order to fill this gap in the literature.

The fundamental framework we have used as the basis for our study is the Resource Based View (RBV) theory, which can contribute to our analysis of R&D intensity and CSR because this perspective explicitly recognizes the importance of intangible resources, such as know-how, corporate culture and reputation (Russo and Fouts, 1997). Furthermore, other researchers agree with the use of RBV for studying these variables by stating that the usefulness of RBV in the study of CSR is due to the emphasis it places on the importance of specific intangible resources, as they are very difficult to imitate and substitute (Branco and Rodrigues, 2006).

Our research adopted a panel data methodology. This technique allows us to control the risk of unobserved heterogeneity on the manager's conceptions of social responsibility and

company strategy (Bouquet and Deutsch, 2008). Our main hypothesis states that R&D intensity positively affects CSR. We take a step forward in our second hypothesis by examining this effect between firms in manufacturing and non-manufacturing industries. We expect this effect to be stronger in firms in manufacturing industries, as previous studies such as the ones by Hadlock, Hecker and Gannon, (1991), positing that manufacturing industries have high R&D concentration, and by Hull and Rothenberg, (2008); McWilliams and Siegel, (2000); Rothenberg and Zyglidopolous, (2007), have stated that R&D intensive firms are likely to have high CSR.

This article contributes to the literature in several different ways: firstly, we are studying an effect between two variables that until now has not been studied in this way; secondly, we are studying the impact of one variable on the other between manufacturing and non-manufacturing industries; finally, we are using a panel data methodology that gives robustness to our research.

The remainder of the paper is organized as follows: the second section reviews the Resource Based View theory and the empirical evidence, and the hypotheses are presented; the third section describes the data and estimation method used in our analysis; the results are discussed in our fourth section and, finally, the fifth and last section presents our conclusions to this research.

2. – THEORY AND HYPOTHESES

The Resource Based View and Competitive Advantage

The Resource Based View (RBV) was developed from the idea of the industrial organization (IO) view of the firm (Bain, 1959; Porter, 1980, Russo and Fouts, 1997), which

stated that a firm's success was wholly determined by external factors. Early resource-based researchers found this unrealistically limited and turned to Penrose (1959) for motivation in developing theories for the RBV of the firm (Russo and Fouts, 1997). To argue against the IO view of the firm, several theorists such as Dierickx and Cool (1989), Prahalad and Hamel (1990) and Wernerfelt (1984) constructed the resource-based theory stating that a firm's success was not wholly determined by external factors but also by its internal characteristics.

According to the RBV, firms with assets that are valuable and rare possess a competitive advantage and may expect to earn superior returns, and those firms whose assets are also difficult to replicate may record a sustained superior financial performance (Barney, 1991; Grant, 1991; Roberts and Dowling, 2002).

Yet the RBV is not only about internal competencies and how they can generate competitive advantages; the firm is also affected by external factors. "Resources cannot be evaluated in isolation. A resource that is valuable in a particular industry or at a particular time might fail to have the same value in a different industry or chronological context" (Collis and Montgomery, 1995:120)

According to Grant (1991), resources are classified as tangible, intangible, and personnel-based. Tangible resources include physical resources such as infrastructure, equipment, raw materials, and financial reserves. Intangible resources include reputation and technology. Personnel-based resources involve such concepts as culture, training, commitment, loyalty and knowledge. None of these resources is productive on its own, but a combination of these is what will make the firm productive. (Russo and Fouts, 1997)

The RBV can contribute to our analysis of R&D intensity and CSR because this perspective explicitly recognizes the importance of intangible resources such as know-how,

corporate culture and reputation (Russo and Fouts, 1997). Moreover, other researchers agree with the use of the RBV to research these variables by stating that the usefulness of the RBV in the study of CSR is explained by the emphasis it places on the importance of specific intangible resources, as they are very difficult to imitate and substitute (Branco and Rodrigues, 2006).

Importance of CSR and R&D for Firms to Obtain Competitive Advantages

We will begin by giving the definition of CSR used by McWilliams and Siegel (2001), whereby CSR involves those situations in which the firm takes part in "actions that appear to further some social good, beyond the interests of the firm and that which is required by law" (117:2001). It has been proven that a high level of CSR is a strategy that firms can use to differentiate themselves (Hull and Rothenberg, 2008; Mackey, et. al., 2007; Siegel and Vitaliano, 2007) in order to obtain certain competitive advantage. Moore (2001) and Harrison and Freeman (1999) make an important point when they state that social performance and economic performance should not be separated, since in order to determine whether a firm is "good", it has to perform well on both counts. Research and development (R&D) is another way a firm can obtain competitive advantage (Hull and Rothenberg, 2008), with the long-standing theoretical literature linking investment in R&D with improvements of the firm in the long run (McWilliams and Siegel, 2000; Griliches, 1979).

CSR can be viewed as a type of investment used as a mechanism for product differentiation, where CSR can be positioned in the context of 'resources', in which CSR policies would help to improve processes for developing products and services, and of 'outputs', where CSR policies and attributes would have a direct impact on a firm's product. For example, firms can maintain a level of CSR by having products with "CSR attributes (such as pesticide-free fruit) or by using CSR-related resources in their production processes (such as

naturally occurring insect inhibitors and organic fertilizers)" (McWilliams and Siegel, 2001). It has been found that the introduction of new and improved processes and products is positively related with R&D intensity (Hitt, Hoskisson, Johnson, and Moesel, 1996). Innovative strategies employed by firms have a substantial impact on processes; in order to create new products and services that have a competitive advantage, they must meet the four criteria described by the RBV theory, namely, they should be valuable, rare, inimitable, and the organization must be organized to deploy these resources effectively (Barney, 1991). Using these criteria, resources that may lead to a competitive advantage include socially complex resources such as reputation, corporate culture, long-term relationships with suppliers and customers, and knowledge of assets (Barney, 1986; Hillman and Keim, 2001; Leonard, 1995; Teece, 1998)

At the same time, researchers contend that it is important for businesses to look beyond their narrow focus of social responsibility and take social concern into consideration in strategic management decisions, as this will ensure business interests in the long term by creating a close bond with their community (Carlson, Grove and Kangun, 1993; Quazi and O'Brien, 2000). Further research shows that consumers prefer products and invest in firms that care for the environment and maintain good citizenship behaviour (Zaman, Yamin and Wong, 1996; Gildia, 1995; Quazi and O'Brien, 2000), which helps the firm to build a good reputation and image as valuable resources that can create a competitive advantage for it.

Schnietz and Epstein (2005) agree with McWilliams and Siegel (2001) and Lantos (2001) in that CSR creates a reputation that a firm is honest and reliable, giving financial value to the firm. In response to this reputation, consumers will typically assume that the products of these types of firms are of good quality, and they become difficult for other firms to imitate. In addition, firms in industries with skilled labour shortages have used CSR as a means to recruit

and retain workers. Brammer and Pavelin (2006) state that depending on a firm's industry and environment, social responsibility actions must vary in order to fulfil general stakeholder expectations and build a good reputation.

At the same time, firms can profit through the use of R&D, since R&D intensive industries usually have 'entry barriers' where companies can achieve effects such as economies of scale and product differentiation (Porter, 1979). These effects help firms to obtain a competitive advantage over other firms. How R&D investment affects firm productivity is a question that is of considerable interest to several researchers. There is the seminal work by Griliches (1981) and his hedonic model based on US firm-level data, which used market value as an indicator of the firm's productivity from investments in R&D. Several other researchers have used this same model to prove that there is a positive relationship between R&D investments and the market value of the firm (Cockburn and Griliches, 1988; Hall, 1993; Hirschey, 1982; Jaffe, 1986).

R&D is considered to be a form of investment in 'technical' capital that results in knowledge enhancement, which leads to product and process innovation. This innovative activity allows firms to enhance their productivity (McWilliams and Siegel, 2000). Studies such as those by Ben-Zion (1984), Clark and Griliches (1984), Griliches (1998), Guerard, Bean and Andrews (1987), Hall (1999) and Lichtenberg and Siegel (1991) report similar results that confirm a positive correlation between R&D investment and firm growth. Investment in R&D involving innovation related with CSR processes and products is attractive to some consumers, such as recycled products or organic pest control. McWilliams and Siegel (2001) stated that using a differentiating strategy in order to obtain a competitive advantage through the use of CSR resources may also include investment in research and development (R&D).

McWilliams and Siegel (2000) proved that CSR is positively correlated with R&D intensity "because both are associated with product and process innovation" (2000:607). If CSR and R&D are highly correlated, an equation that includes CSR and does not include R&D intensity as determinant of a firm's performance will turn out to be upwardly biased. Other researchers have also suggested that R&D should be included as a moderator in theoretical models that have received mixed or ambiguous empirical support (Han, et. al., 1998; Hull and Rothenberg, 2008).

Therefore, a longitudinal study of the interactions between R&D intensity and CSR variables is called for (Hull and Rothenberg, 2008), as one that will provide insight and facilitate an understanding of the interaction that exists between these two variables.

Based on the above arguments, we therefore suggest the following hypothesis:

H1: R&D intensity positively affects CSR.

Earlier research (Graves and Waddock, 1994) has shown that there are clear differences between different industries in levels of investment in R&D (Waddock and Graves, 1997). Furthermore, the characteristics of a firm's industry have been hypothesized to be a key influence on its social performance (McWilliams and Siegel, 2000), since industries differ according to the stage of the product lifecycle they are in. The use of CSR as a differentiation strategy will be present depending on the industry's lifecycle, since little product differentiation is expected in the embryonic and growth stages because firms are focused on perfecting processes and satisfying growing demands (McWilliams and Siegel, 2001). Some industries will be young and companies active in them will have a range of alternative investment

projects, whereas mature industries offer fewer alternative investment opportunities to their companies. (Brammer and Millington, 2008) In addition, depending on the industry, companies may have a different view of CSR actions and the way they are implemented in their R&D processes. Quazi and O'Brien (35:2000) state that "the broader dimension of social responsibility, therefore, calls for innovation in production and marketing to reap the benefits of proactive social action". The authors give the example of pollution control and how some companies consider it to be an unnecessary expense, thereby perceiving it negatively in financial terms. Meanwhile, other firms may argue that pollution is a sign of inefficiency and flawed technology that also costs the firm money and affects the community. This second perspective is supported by Ahmed, Montagno and Flenze (1998), who have found that environmentally friendly companies have better productivity and profitability than non-environmental firms.

R&D intensity varies according to the industry, and is usually more intense in manufacturing industries than in non-manufacturing ones. For example, the automotive industry has initiated intensive R&D programmes in order to develop a new kind of technology-based competition in response to current environmental changes, long-term increases in petrol prices and regulatory efforts to curb the threat of global climate change (Khaledabadi and Magnusson, 2008).

These types of changes and increasing stakeholder pressure on firms to tackle social issues are driving more and more companies to engage in CSR activities (Quazi, 2003). Moreover, R&D intensive industries such as pharmaceuticals may face particular incentives to engage in CSR activities that boost the long-term supply of highly skilled labour. (Brammer and Millington, 2008) Another reason that manufacturing industries might increase their CSR

activities is that, according to Nicolleti and Scarpetta (2003), there are more industry-specific regulations are in manufacturing industries than in non-manufacturing ones.

Williamson, Lynch-Wood and Ramsay (2006) state that manufacturing processes have significant economic and environmental impacts, which have led firms to develop CSR practices that favour our environment. Many firms are adopting voluntary environmental management systems, signing international agreements such as the UN Global Compact, or have joined local projects to minimise waste. "These trends have largely been driven by an increasing demand for "transparency" from stakeholders, and perceived consumer demand for environmental quality" (Chapple, Paul and Harris 348:2004). These national and industry forces create environments in which stakeholders and local competitors have different expectations of what the appropriate levels and types of corporate citizenship should be (Gardberg and Fombrun, 2006), with more pressure being placed on manufacturing industries because they are believed to use up more resources, create more waste and have a higher intensity of R&D activities than their non-manufacturing counterparts simply because of the nature of their processes.

Consequently, we decided to look for differences in the intensity of the impact of R&D on CSR activities between manufacturing industries, which are those that are acknowledged to have a high intensity of R&D, and non-manufacturing ones. To do so we developed the following hypothesis:

H2: R&D intensity positively affects CSR with a higher intensity in manufacturing industries than in non-manufacturing industries.

3. – METHODS

Data and Sample

In order to associate R&D intensity with CSR we needed data to create a single database on how firms interact with their stakeholders and society along with corporate financial data. The corporate financial data are taken from Thomson's Datastream and the CSR data are from KLD Research and Analytics, Inc.

Over 40 peer-reviewed articles, representing a variety of academic fields (including finance, economics, management and sociology) have used KLD data to research companies' social, environmental and governance performance (KLD, 2008). Some of these articles are: Cuesta-González, et al., 2006; Hull and Rothenberg, 2008; Márquez and Fombrun, 2005; McWilliams and Siegel, 2000; Schnietz and Epstein, 2005; Waddock and Graves, 1997.

KLD uses screens to monitor corporate social performance (see Sharfman, 1996, for an assessment of data validity). These screens are divided into positive and negative ones, with positive ones signifying company strengths and negative ones signifying company weaknesses. The screens are divided into groups that reflect the firm's general corporate social performance.

The period researched has a span of 16 years, from 1991 to 2007. We excluded companies with missing data, and in order to perform our analysis we divided our sample into three groups. The first model comprised 5,799 observations and 1,217 companies, which is used to explain Hypothesis 1; the second and third models were developed to explain Hypothesis 2, where the second model contained only manufacturing companies and comprised 2,724 observations and 575 companies, and finally, the third model contained non-manufacturing companies and comprised 3,075 observations and 642 companies.

Measures and Estimation Method

KLD data are designed as a binary system. For each strength or concern in each variable, rating 1 indicates the presence of a strength or concern, while 0 indicates its absence. For the first hypothesis, *CSR* is our dependent variable, where we used KLD data to develop the same scale used by Hillman and Keim (2001), which is also used by many other authors (Cuesta-González et al, 2006; Hull and Rothemberg, 2008). The CSR rating is scored using a scale ranging from -2 (major concerns), -1 (concern), 0 (neutral), +1 (strength), to +2 (major strength). To check the robustness of our models, we replaced the CSR scale that ranges from -2 to 2 with an alternative specification of the dependent variable, as used in industrial organization and strategy research (Kortum and Lerner, 2000), which is equal to the logarithm of the sum of strengths plus 1 (Kacperczyk, 2008). We obtained a significant result with both measures. We refer to this variable as CSR+ in our results tables.

R&D intensity is our independent variable, where we use a proxy of R&D, calculated by dividing total expenditure on R&D by total sales, basing our study on measures used by McWilliams and Siegel, (2000), Bouquet and Deutsche (2008), and Prior, Surroca and Tribo (2008) which showed that R&D is positively correlated with CSR. Other research that has corroborated the correlation between these two variables includes the study by Hull and Rothenberg (2008), which measured R&D using a 3-year average of R&D expenditures, and yet another study that has recorded the same finding as the studies mentioned above, Berrone et al. (2007), who measured R&D intensity as R&D expenditures to total assets on a log scale.

We include several control variables in our model. We used *company size* because previous articles have suggested that it is closely related to CSR (Johnson and Greening, 1999; Udayasankar, 2008; Waddock and Graves, 1997). To measure company size in our analysis we

used net sales (Brammer and Millington, 2008; Kacperczyh 2008) and number of employees (Berman, et. al., 1999), both defined on a log scale.

We used *ROA* (return on assets) as a control variable as well, as it yields the most direct information about the results in the allocation of resources by a firm as it seeks competitive advantage (Hull and Rothenberg, 2008). *ROA* is calculated as *operating income over total assets*.

In addition, we included *Risk* as a control variable, since several studies have found that a firm with proactive CSR engages in managerial practices, such as stakeholder management (Wood, 1991), which tend to anticipate and reduce potential sources of business risk, such as potential governmental regulation, labour unrest, or environmental damage (for details see: Orlitzky and Benjamin, 2001). As a proxy for management risk tolerance, we use the level of debt held (*total debt to total assets ratio*) by the firm (Hull and Rothemberg, 2008).

For our second hypothesis we analyze the same effect as in our first hypothesis, but we divide our sample using SIC industry classification into manufacturing and non-manufacturing industries, to determine where this relationship is more intense.

We used the panel data methodology to estimate our models. Unlike cross-sectional analysis, panel data analysis allows us to control every firm and has its own specificity that gives rise to a particular behaviour closely linked to the company's strategy. This choice was motivated by the importance of considering significant problems that arise when studying the influence that R&D intensity has on CSR.

Unobserved variables can be eliminated by specifying a fixed-effects or a random-effects model, as several sequential (yearly) observations of the same company are recorded. More

specifically, given the longitudinal data on firm R&D intensity for firm i at moment t-1 on CSR at moment t can be modelled as follows:

$$CSR_{it}=\alpha + \beta'R\&D_{it-1} + \beta'ROAi\ t\text{-}1+ \beta'salesi\ t\text{-}1+ \beta'employeei\ t\text{-}1+ \beta'riski\ t\text{-}1+ ni + vit$$

Where CSR_{it} is firm i's CSR associated with the current year; $R\&D_{it-1}$ is the R&D intensity of firm i associated with the previous year; ROAi t-1, salesi t-1, employeei t-1 are control variables for firm i associated with the previous year; ni is a time invariant firm specific error that captures the effects of unobservable characteristics; vit is the error term. It is important to note that the models also incorporate a yearly trend variable to account for differences over time.

4. – RESULTS

Table 1 provides the descriptive statistics (mean and standard deviation) of our three models with both measurements of CSR that we used in our research to make our analysis more robust. It shows the dependent variables CSR and CSR+ in year t and all independent variables in t-1. One can also observe the sample size of all models and the number of firms, with a total of 5,798 observations and 1,217 firms in model 1. Our model 2, which considers firms in manufacturing industries, has a total of 2,724 observations and 575 firms and, finally, our model 3, which considers firms in non-manufacturing industries, has a total of 3,074 observations and 624 firms.

Table 1 - Main Descriptive Statistics: Comparison Between Models

Variable	Model 1: Whole Sample Mean	Model 1: Whole Sample Std. Dev.	Model 2: Manufacturing Industries Mean	Model 2: Manufacturing Industries Std. Dev.	Model 3: Non-Manufacturing Industries Mean	Model 3: Non-Manufacturing Industries Std. Dev.
CSR+	0.6210536	0.6504617	0.6271596	0.6525744	0.6196441	0.6503911
CSR	-0.1296643	1.379216	-0.1169154	1.386099	-0.1386838	1.374846
R&D	0.0924276	2.424787	0.158977	3.498876	0.0329601	0.124602
ROA	7.182965	10.6331	7.110276	11.65514	7.24723	9.641149
Net Sales	14.05634	1.692323	14.03404	1.81485	14.0482	1.607418
Employees	8.519166	1.696531	8.493667	1.698347	8.525471	1.706439
Risk	0.2162667	0.1867397	0.2026556	0.1685136	0.2284379	0.2012748
Sample Size	5798		2724		3074	
Number of Firms	1217		575		624	

CSR+ = Log(∑strengths + 1); CSR = Scale ranging from -2 to +2; R&D = R&D to total sales; ROA = Return on Assets; Net Sales = Logarithm of net sales (proxy for size); Employees = Logarithm of employees (proxy for size); Risk = Total Debt to Total Assets Ratio

All independent variables are in t = - 1

Table 2 shows the correlation matrix for the total sample. There is a negative significant correlation between the size control variables (net sales and employee) and ROA with both our measures of CSR. As can be seen, we were unable to find a significant correlation between R&D and any measure of CSR, although the impact of R&D on CSR in the panel data analysis is positive and significant in both model 1 and model 2.

Table 2 - Correlation Matrix of Total Sample

	CSR+	CSR	R&D	ROA	Net Sales	Employees	Risk
CSR+	1.0000						
CSR	0.7059***	1.0000					
R&D	0.0106	0.0145	1.0000				
ROA	-0.0251*	-0.0386***	-0.0560*	1.0000			
Net Sales	-0.0410***	-0.0552***	-0.0634***	0.1139*	1.0000		
Employees	-0.0281***	-0.0480***	-0.0481***	0.0573*	0.8678***	1.0000	
Risk	0.0244**	0.0198	-0.0096	-0.1862***	0.1755***	0.1318***	1.0000

*p<0.10; **p<0.05; ***p<0.01

Table 3 presents the results of the panel data analysis for our three models using CSR as our dependent variable and R&D as explanatory variable, controlling for size (net sales and employees), ROA and risk, using a 1-year lag between CSR and all independent variables. As can be observed in Model 1, R&D, Net Sales and employees are significant, whereas ROA and risk variables are not. The effect that R&D has on CSR is positive at a significance level of $p<0.01$, and model 1 has an R-squared within 0.0414. When we performed the Hausman Specification Test to determine whether or not to use a fixed-effects model or a random-effects model in our analysis, we obtained a negative result. In view of this negative result, we had to perform the Sargan-Hansen statistic, which resulted in 54.887, thus the model of choice for our analysis is a fixed-effects model.

Table 3 - Comparison Between Models with CSR Measure

	Model 1: Whole Sample CSR			Model 2: Manufacturing Industries CSR			Model 3: Non-Manufacturing Industries CSR		
	Coef	Std Err	Sig	Coef	Std Err	Sig	Coef	Std Err	Sig
R&D	0.014856	0.0012873	***	0.0136896	0.0015502	***	-0.1759526	0.392761	
Net Sales	-0.1644	0.0802835	*	-0.1762979	0.1194407		-0.1406568	0.1100122	
ROA	0.000216	0.0021904		-0.0034267	0.0028165		0.0046161	0.0034156	
Employees	0.148521	0.0860951	*	0.1635475	0.1313423		0.1055313	0.1159956	
Risk	-0.01084	0.21024		0.1309141	0.3413905		-0.0659303	0.2669777	
_cons	1.217404	0.6252478	*	1.49645	0.9634171		1.494705	0.9164471	
R-squared within	0.0414			0.0432			0.0475		
σ_u	0.82682512			0.84669619			0.80925		
σ_e	1.1810379			1.1686181			1.1920106		
F from regression (Prob>F)	20.96		***	16.56		***	5.5		***
Corr(u_i), xb	-0.0194			-0.016			-0.0186		
Number observations	5798			2724			3074		
Number groups	1217			575			642		
Chi2 Hausman - fixed x random	54.887 † (-21.55)		***	29.1		*	7.67		

Estimation also includes dummy for the years (1992 - 2007)
*p<0.10; **p<0.05;
***p<0.01
† Since chi2 from Hausman test was negative, value corresponds to Sargan-Hansen statistic

Table 4 shows the results of the panel data analysis for our three models using CSR+ (our second measure of CSR) instead of CSR. Model 1 obtained similar results in Table 4 as it did in Table 3, where R&D also affects CSR+ in a positive way at a $p<0.01$ level. These results confirm our first hypothesis, where we state that R&D intensity affects CSR in a positive way.

Table 4 - Comparison Between Models with CSR+ Measure

	Model 1: Whole Sample CSR+			Model 2: Manufacturing Industries CSR+			Model 3: Non-Manufacturing Industries CSR+		
	Coef	Std Err	Sig	Coef	Std Err	Sig	Coef	Std Err	Sig
R&D	0.0046617	0.0007523	***	0.0048813	0.0007525	***	0.074021	0.1682013	
Net Sales	-0.1119344	0.0377518	**	-0.0442721	0.0560148		-0.1596036	0.0510554	**
ROA	0.0005733	0.0010914		-0.0012517	0.0015056		0.0024247	0.0015724	
Employees	1039918	0.03894	**	0.0554918	0.057032		0.1303517	0.0533218	
Risk	0.1140165	0.0979225		0.0195508	0.1582408		0.2186913	0.1235075	
_cons	1.285845	0.3018529	***	0.9303023	0.4618995	*	1.924293	0.4414174	***
R-squared within	0.0334			0.0358			0.0385		
σ_u	0.39259011			0.38542257			0.41046963		
σ_e	0.55820282			0.5567568			0.55967847		
F from regression (Prob>F)	10.62		***	10.96		***	4.71		***
Corr(u_i), xb	-0.031			0.0713			-0.1795		
Number observations	5798			2724			3074		
Number groups	1217			575			624		
Chi2 Hausman - fixed x random	98.273 † (-26.15)		***	88.930 † (-87.55)		***	43.49		**

Estimation also includes dummy for the years (1992 - 2007)
*p<0.10; **p<0.05;
***p<0.01
† Since chi2 from Hausman test was negative, value corresponds to Sargan-Hansen statistic

Table 3 also shows the results of our panel data analysis for Model 2, where we include firms in manufacturing industries only, and the results for our Model 3 analysis, where we include firms in non-manufacturing firms only. Here we found that R&D intensity positively affects CSR at a $p<0.01$ in Model 2, while Model 3 displays no significance in the effect that

R&D intensity has over CSR. After performing the Hausman Specification Test for Model 3, the result showed no significant correlation between the unobserved person-specific random-effects and the regressors, so the random-effects model may be more powerful and parsimonious, thus being our model of choice for Model 3, while the results of this test determined that we should use a fixed-effects model for Model 2.

Table 4 shows similar results between this effect in Model 2 and Model 3 and our other measure of CSR+. However, with this measure of CSR+, the Hausman Specification Test indicated that we should use a fixed-effects model instead of a random-effects model for both Model 2 and 3. These results confirm our second hypothesis, which states that R&D intensity impacts CSR to a greater degree in manufacturing industries than in non-manufacturing industries.

5. – DISCUSSION AND CONCLUSION

The RBV theory allows us to analyze the effect of R&D intensity on CSR because, as we stated before, this theory explicitly recognizes the importance of intangible resources, which are difficult to imitate and substitute. As discussed previously, both CSR and R&D possess characteristics that are consistent with the RBV theory, making them very important resources that will allow a firm to achieve a competitive advantage and at the same time benefit society. Given the importance of these resources in a firm's performance, many studies have focused on understanding the relationship between CSR and financial performance or between R&D and financial performance. Recent studies have shown that in order to measure accurately how CSR affects a company's financial performance, R&D must be included in the study so that the results do not give an upwardly biased estimate of the CSR variable (McWilliams and Siegel,

2000). Several previous studies have also found a significant correlation between these two resources, so it is important to understand the effect that one has over the other.

The results of this research provide support for our first hypothesis, which states that R&D intensity affects CSR in a positive way. R&D is considered to be a form of investment that results in knowledge enhancement, leading to product and process innovation. These product and process improvements can lead to CSR-related processes and products. For example, R&D activities might improve processes and make them more effective, which can also reduce the amount of energy the firm consumes, with the ensuing cost reductions and less pollution. Such activities should also be taken into account as CSR actions of the firm. Previous research has shown that these two variables depend on the industry they are in, so consistent with our reasoning that product and process innovation brings CSR activities to the firm, we decided to test this effect in both manufacturing and non-manufacturing industries. Our results show that the effect that R&D intensity has on CSR is positive and significant in manufacturing industries, while in non-manufacturing industries R&D intensity has no significant effect on CSR. This finding shows that firms in industries with a higher intensity of R&D also devote efforts to CSR activities. This result might be explained by the fact that manufacturing industries are under more pressures from stakeholders and government policies to carry out CSR activities. Even if this might be true, some firms always choose to exceed stakeholder expectations and policies by engaging CSR actions that minimise waste and reduce energy consumption, and by initiating progressive human resource management programmes (Chapple, Morrison and Harris, 2004).

The academic value of this research is that it has filled a gap in the literature, since to our knowledge there has been no other study that focuses on understanding the effect that R&D intensity has on CSR as we proposed, and our model was estimated using panel data

techniques, which are better capable of controlling for inherent heterogeneity than a simple regression. The results of this study enforce previous research that states the importance of taking R&D intensity into consideration when studying the relationship between CSR and a firm's financial performance.

The managerial value of this study is that firms need to take their R&D activities into consideration when developing their CSR strategy, since process and product innovations may already be involved in CSR activities. Thus, innovative firms should focus their efforts on identifying opportunities in their R&D processes to initiate related CSR activities. This will allow the company to manage costs more effectively and determine whether other CSR activities might be necessary to meet stakeholder expectations. This is important for managers following differentiation strategies by investing in R&D and CSR, since they are related activities that provide a firm with a competitive advantage. In addition, firms should make an effort to ensure that they "are a part of a larger society with a wider responsibility reaching beyond the narrow perspective of profit" (Quazi and O'Brien, 33:2000), which is an opportunity for building a sustainable relationship with stakeholders (Polonsky et al., 1997; Quazi and O'Brien, 2000).

For further research it might be interesting to study the effect that R&D intensity has on the CSR of individual manufacturing industries, since this effect might be stronger or weaker depending on the characteristics of the industry. Furthermore, because of CSR's complexity, a study of the effect that R&D intensity has on different CSR dimensions might provide broader insight and understanding of this effect.

CHAPTER 3

INNOVATION WITH HIGH SOCIAL BENEFITS AND CORPORATE FINANCIAL PERFORMANCE

1. – INTRODUCTION

Previous literature has identified several reasons or incentives for firms to incur in Research and Development (R&D) activities (Coombs and Beirly, 2006; Holmes and Smart, 2009; McWilliams and Siegel, 2000; Wagner, 2010). Given the significant regulatory and non-regulatory pressures on firms to decrease pollution and costs, it is natural to wonder whether innovation is a response to these pressures or to other market forces such as international competition and industry or economy-wide characteristics. Current literature about this subject is sparse (Brunnermeier and Cohen, 2003), which makes it difficult to determine what actions are performed by firms, to respond to these pressures. A number of empirical studies have attempted to identify such actions at firm and industry levels (e.g. Brunnermeier and Cohen, 2003; Chen, Lai and Wen, 2006; Dangelico and Pujari, 2010; Jaffe and Palmer, 1997; McWilliams and Siegel, 2000; Rennings et al., 2006).

McWilliams and Siegel (2000) demonstrate, R&D intensity is a significant driver of firm performance, and when R&D intensity is included among the independent variables the significance of the effect of CSR on financial performance disappears. Also, they demonstrate that CSR is positively correlated with R&D intensity. Another research by Hull and Rothenberg (2008), corroborate this finding and finally Padgett and Galan (2010) study the relationship between these two variables and found a significant positive relationship. A more recent research Wagner (2010) analyzes the link between innovation with high social benefits and

corporate social performance. However, to our knowledge there is no research have studied the direct impact of innovation with social benefits has on corporate financial performance, so we considered it necessary to study this effect in order to fill this gap in the literature.

This article analyzes the effect that innovation with high social benefit has on financial performance, and to improve our understanding of this effect we extend our research by analyzing the effect that being an innovation leader has on financial performance, with the intention of observing different innovation strategy effects on financial performance. To support this analysis we will make use of the resource-based view theory and the institutional theory. The resource-based view (RBV) theory of strategic management (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984) examines resources and capabilities of firms that enable them to obtain a competitive advantage. Despite the valuable insights of the RBV theory some aspects have not been examined, such as the social context within which resource selection decisions are embedded and how this context might influence sustainable differences (Oliver, 1997; Ginsberg, 1994). According to Oliver (1997), in order to complement the RBV theory and analyze the social context of resources, it is necessary to include the institutional theory (DiMaggio and Powell, 1991; Scott, 1995), which examines the role of social influences and pressures for social conformity in determining organizations' decisions and actions.

Our research used a panel data technique, which allowed us to control the risk of unobserved heterogeneity on the manager's conceptions of social responsibility and company strategy (Bouquet and Deutsch, 2008). Our main hypothesis tries to identify if innovation with high social benefit has a positive impact on financial performance, since firms seek to obtain benefits such as differentiation and higher sales from innovation. In addition, our second hypothesis studies the effect that being an innovation leader has on financial performance, as we had mentioned before, in order to compare these two types of innovation strategies and how

they affect the firm's financial performance. Some researchers like Lev, Redhakrishnan and Ciftci (2006) have stated that there is a clear difference in the performance of innovation followers and leaders. Innovation leaders are recognized as having excess returns, because of higher sales growth, and return on assets.

This article contributes to the literature because we are studying the effect that innovation with high social benefit has on financial performance, which observes and aids to determine if firms have a financial incentive to incur in innovative activities that produce some kind of social benefits. If there is no financial incentive in the short-term, it should be a sign for governmental and non-governmental institutions to create an incentive for firms that are doing this type of innovative activities. Since, there are other innovative strategies, that may lead to competitive advantage and profitability in short term, as being an innovation leader can be. Furthermore, we combine the RBV and the institutional theory in order to build a theoretical framework that supports researches such as Oliver's (1997). Regarding managerial contributions, our research provides an insight of what firms should expect when participating in innovation with high social benefits.

2. – THEORY AND HYPOTHESES

Resource Based View and Institutional Theory

"A resource based view proposes that resource selection and accumulation are a function of both within-firm decision making and external strategic factors" (Oliver, 1997:698). Whether resource selection and accumulation result in competitive advantages, it will depend upon market imperfections, such as barriers to acquisition, imitation, and substitution of key resources or inputs (Barney, 1991; Penrose, 1959; Schoemaker and Amit, 1994). These barriers

create differentiation, allowing the resource holders to achieve competitive advantages over competitors, whose abilities are held back because of their struggle to obtain or duplicate these resources (Barney, 1986; Dierickx and Cool, 1989).

According to Russo and Fouts (1997), the RBV theory firm offers corporate social responsibility researchers a tool for refining the analysis of corporate social policies, because it has a strong focus on performance as the key outcome variable and it explicitly recognizes the importance of intangible concepts.Even though the RBV has provided numerous insights, according to Oliver (1997), the RBV theory does not address the process of resource selection, decisions and rational choices about resource selection in order to achieve economic rents. In order to cover these "gaps" in the RBV theory we will include insights from the institutional theory (DiMaggio and Powell, 1991; Scott, 1995) in this research.

Drawing on the institutional perspective, our research will be strengthened by the idea that resource selection and sustainable competitive advantage are profoundly influenced, by the firm's circumstances, such as rules, norms, and beliefs surrounding economic activities that define or enforce socially acceptable economic behaviors taken into account for resource decisions (Oliver, 1997).

Researches based on institutional theory like, Galaskiewicz's (1991) showed that firms tend to act socially responsible when normative or cultural institutions create incentives for such behavior. Also, Beliveau, Cottrill and O'Neil (1994), found that corporate social performance and its relationship with firms' profitability varies by industry. This could be explained because of the "overall profile of the industry in terms of its public visibility and the degree of scrutiny from government and the public it operates under, the competitive structure of the industry, and the overall historically determined culture of the industry" (Jones, 1999:167). CSR is attracting considerable publicity and as a result, CSR has surfaced as an

unavoidable priority for business leaders around the world, because it is being recognized as a source of opportunity, innovation, and competitive advantage (Porter and Kramer, 2006).

From the above statements it can be seen that the RBV theory supports the intentions of firms to participate in R&D activities, because these innovations will produce a differentiation in the market, thus creating a competitive advantage that will generate above normal rates of return. Meanwhile, the institutional theory supports the intentions of firms to participate in R&D activities because they acquire legitimacy when they attend to stakeholder pressures that call for innovation to reap the benefits of proactive social action (Quazi and O'Brien, 2000).

Innovation with high Social Benefit

As was mentioned before, several researchers have found a link between CSR and R&D intensity. For example, McWilliams and Siegel (2000) and Hull and Rothenberg (2008) demonstrate that CSR is positively correlated with R&D intensity and Padgett and Galan (2010) demonstrate that R&D intensity positively affects CSR. Also, McWilliams and Siegel (2001) research suggests that firms can participate in CSR activities by product or process innovation. They give the example of products that have CSR properties such as pesticide-free fruit or processes such as naturally occurring insect inhibitors and organic fertilizers. These kinds of innovations besides providing a benefit to the company provide certain benefits to society.

A more recent research Wagner (2010) analyzes the link between innovation with high social benefits and corporate social performance. The author describes how firms can do innovation that produces private benefits, such as improved products, creating advantages to the firm. Also, these innovations can produce social benefits, such as process improvements that reduce pollution. The author establishes that innovation should have an equilibrium where companies are encouraged to innovate because they will obtain higher rents and at the same

time give something to society. According to Wagner (2010), innovation with high social benefits can be defined as an innovation that has a positive direct social effect, such as reduced environmental externalities and provision of products or services for the economically disadvantaged.

The basic argument of the RBV theory is that rare, specialized, inimitable resources cause firm heterogeneity, and that successful firms are those that acquire and maintain valuable idiosyncratic resources for sustainable competitive advantage. If firms go one step further and conform to predominant norms, traditions, and social influences in their internal and external environments will gain support and legitimacy, according to the institutional theory (Oliver, 1997) and become successful at least over the long term (Jones, 1995). Rennings (2000), states that essentially it does not matter whether firms pursue innovations with high social benefits for profit or not, although most firms will attempt to achieve profit by pursuing innovation with high social benefit. Scott (1987) observes that organizations "play the game" because they are rewarded for doing so through increased legitimacy, resources and survival capabilities. In addition, firm's legitimacy, leads to obtaining a good reputation (Doh, Howton, Howton and Siegel, 2010).

There are several studies that have studied the effect that different kinds of innovation with positive environmental externalities have on firms' performance. For example, Chen et al (2006) who demonstrate that innovation related with energy-saving, pollution-prevention, waste recycling, green product designs, or corporate environmental management, have a positive effect to the competitive advantage. This study found that the performances of these types of innovations were positively correlated to the corporate competitive advantage. A more recent research, Dangelico and Pujari (2010), found from several case studies, that companies are

motivated in innovations with positive environmental externalities, because of increasing profits, improvement of reputation and corporate image.

Furthermore there is a mutual dependence between corporations and society which implies that both business decisions and social actions must follow the principle of *shared value* (Porter and Kramer, 2006). Choices must benefit both sides, because if either businesses or society pursue actions that benefit their own interests at the expense of the other, they will find themselves on a risky path, where a momentary gain of one will weaken the long-term prosperity of both (Branco and Rodriguez, 2007; McWilliams, Siegel and Wright, 2006; Porter and Kramer, 2006). Based on these insights, the following hypothesis can be stated:

Hypothesis 1: Innovation with high social benefit has a positive effect on corporate financial performance.

Innovation Leaders

According to Porter (1985) firms strategically choose to be innovation leaders or followers: some firms are leaders in R&D and introduce new and innovative products while others are followers who mimic or react to the products of the leaders. In addition, firms tend to view innovation leadership mainly as a vehicle for achieving differentiation, while being a follower is considered an approach to achieving low cost, thus, the decision of being a leader or a follower is based on sustainability of the technological lead, first mover advantages and first mover disadvantages (Porter, 1985).

The competitive advantage that leaders have may come from a variety of sources, such as lower cost, better products and services, faster innovation, strong distribution channels, and

financial strength, meanwhile followers lack some of the advantages that leaders have (Ito and Pucik, 1993). These resources cause leaders to differentiate themselves from followers, and it is difficult for followers to achieve competitive advantage because the resources that leaders possess are usually rare and difficult to replicate, allowing them to sustain a superior financial performance (Barney, 1991; Grant, 1991; Roberts and Dowling, 2002). Furthermore, the RBV assumes that resources and capabilities provide firms with a competitive advantage that allows them to pursue opportunities or avoid threats (Barney, 1991), thus allowing leaders to stay ahead of their competitors.

According to Lev, Redhakrishnan and Ciftci (2006), there is a clear difference between innovation leaders and followers, since leaders earn significant excess returns, while innovation followers just earn average returns. Moreover, innovation leaders generate higher sales growth and return-on-assets than followers. Other researches support the view that innovation leaders obtain better results than followers, like the research done by Ito and Pucik (1993), found that market leaders have advantages over followers, due to two reasons: first, for industry leaders, the risk-adjusted returns may be better because leaders have already built competitive advantages in finance, marketing, etc. Second, competitive advantage can be more profitably leveraged through horizontal or vertical differentiation. Also, Caves and Ghemawat (1992) research, which examines the factors that sustain profit differentials across firms within an industry, found that differentiation related strategies such as R&D, play a more important role than cost related strategies.

As we mentioned before, differentiation related strategies are indicative of innovative leadership, such as, new products/services, while cost related strategies are more related with innovative follower behavior. Another research that supports this argument is Klette (1996), which shows that innovation could help improve future profitability due to knowledge-

spillovers across lines of business: innovation could have a lasting impact on performance due to knowledge-spillovers. In addition, Zahra and Covin (1993) provide evidence that suggests that high-performing companies adopt a coherent set of technological choices that, taken together, create a competitive advantage, especially in mature sectors where technology plays a prominent role. Finally, Gruber (1992) shows that in a vertically differentiated product market where fixed costs of innovation decline overtime innovation leaders are persistent in their performance.

Considering the arguments regarding the differences between innovation leaders and followers and why leaders have an advantage, we state the following hypothesis:

Hypothesis 2: Being an innovation leader positively impacts on corporate financial performance.

3. – METHODS

Sample and data

The data was obtained from two databases: Worldscope database and Kinder Lydenburg Domini (KLD) social rating data. KLD database is a reliable source for CSR measures and has been widely used by previous researchers (see Orlitzky et al., 2003; Margolis et al., 2007; Wood, 2010). It comprises numerical assessments on thirteen categories. Seven of those relate to social responsibility qualitative issues' areas and the remaining six to engagement in controversial business. For the first set of dimensions, there is a subset of items regarded as strengths and concerns. The qualitative issues are: product issues; community relations; environmental issues; human rights; governance; employees' relations and diversity of the work

force. The rating is a binary system, where 1 indicates the presence of this item and 0 its absence. Previous researchers have tailored this rating system for their own objectives. From this database we extracted the CSR measure and also innovation with high social impact and leaders in innovation proxy, we give more detail about this proxy later.

The sample composed of US firms is unbalanced and covers a twelve-year period from 1996 to 2007. The sample was screened in various ways as firms' innovation is strongly determined by its sectors' characteristics. We excluded firms that did not contain a primary SIC designation, and defined firms' sectors by their two-digit SIC identification code. We also discarded sectors that have less than 10 observations each year and sectors that have no firms that present innovation with high social benefit. The final sample contains 2025 observations for 418 firms across 7 sectors (Food and Kindred Products; Chemicals and Allied Products; Fabricated Metal Products; Industrial and Commercial Machinery and Computer Equipment; Electronic and Other Electrical Equipment and Components; Transportation Equipment; Measuring, Analyzing and Controlling Instruments, Photographic, Medical and Goods, Watches and Clocks).

Measures

For measuring our dependent variable (CFP) we follow the recent CSR literature and adopted market-based measure (e.g. Bird et al., 2007; Kacperczyk, 2009; Surroca et al., 2010). We decided to use Tobin's *q*, mainly because of its ability to capture the value of long-term investments like innovation investments as explained by Dowell, Hart and Yeung (2000). Tobin's *q* reflects the ratio between the firm's market value and its replacement value of capital. It is calculated by dividing the market value of a company by the replacement value of its book equity.

To measure innovation with high social benefits we follow Wagner (2010) and construct a proxy for it using three useful variables of the KLD database, those that are related with firms' innovation. The first variable is taken from by the strength environment issue qualitative area, called ENV-str-A by KLD, and this variable indicates that a firm has newly introduced products or services which protect the environment or is achieving significant sales with such innovative products or services because of its concern with protecting the environment. The second and third are taken from by the strength product issue qualitative area, the KLD database respectively names them as PRO-str-X and PRO-str-C. PRO-str-X measure whether a firm's products have notable social benefits that are highly unusual or unique for its industry and PRO-str-C records whether part of a firm's mission is the provision of products or services for the economically disadvantaged. These three variables are binary and assume value 1 if the firms have this characteristic and 0 when they do not. Our variable innovation with high social benefits is the sum of these three variables. Furthermore, as proxy innovation leader we also used a KLD binary variable that was taken from the strength product issue qualitative area and is called PRO-str-B in KLD database. This variable indicates that a firm is a leader in its industry for R&D, particularly by bringing notably innovative products to market.

We have used control variables based on the degree to which they may influence the effect that innovation with high social benefit and innovation leader have on CFP. McWilliams and Siegel (2000) show that investment in R&D is positively correlated with CSR and CFP, which can be explained by the fact that some innovations result from investments in R&D generate advantages for society (McWilliams and Siegel, 2000; Padgett and Galan, 2010), however not all R&D investment generates social benefit. Thus is important to control R&D intensity to understand the effect of innovation with high social benefit and the innovation leader on CFP. To measure this, we use a proxy of R&D, calculated by dividing total

expenditure in R&D by total number of employees. This ratio is "less sensitive to the spurious effects of business cycles, accounting manipulations, and asset sales than R&D spending as a proportion of sales" (Baysinger, Kosnik and Turk, 1991:207), and is positively related to patents and product innovations (Hitt, Hoskisson and Kim, 1997).

Therefore, for the purpose of this research it is also necessary to control the firms' overall social responsibility index. We used the five KLD dimensions consistently reported between 1996 and 2007: product issues; community relations; environmental issues; employees' relations and diversity of the work force. These dimensions have been selected because they reflect corporate attention to primary stakeholders with an impact on a firm's survival (Clarkson, 1995) and exert considerable influence on corporate strategy (Berman, Wicks, Kotha, and Jones, 1999). We develop the same scale used by Hillman and Keim (2001), which is also used by other authors (e.g.Hull and Rothenberg, 2008). All of the strengths of each dimension are rated on a scale ranging from 0 to +2, in the same way all concerns of each dimension are rated from –2 to 0. Then, we add the strengths scale plus the concerns scale of each dimension, having as a result a scale ranging from –2 to +2. We build the corporate social responsibility measure giving equal weights to the five dimensions cited above (Hillman and Keim, 2001).

In line with McWilliams and Siegel (2000) who posit importance on the nature of a firm's industry on its innovation and social responsibility, we control industry effect using two-digit SIC sector dummy variables. In addition, we also adopt as control variable a measure of company size, because previous articles have suggested it is closely related to CFP (e.g. Udayasankar, 2008; Waddock and Graves, 1997), and we measure it as the total asset (e.g. Griffin and Mahon, 1997; Hull and Rothenberg), defined on a log scale. Risk is another factor

used as a control variable; we have adopted β (beta) - a standard indicator of market-based risk (Hillman and Keim, 2001).

4. – RESULTS

Assuming the long-term effect of innovation and social actions have on CFP, we have estimated our models with a one-year lag on innovation leader, innovation with high social benefits, the independent variables, and also on R&D intensity and corporate social responsibility control variables. We have also estimated our models with a two-year lag on these variables and found a similar result. We have used the panel data technique to estimate our model. Unlike cross-sectional analysis, panel data allows us to control every firm. Our models were initially specified using the fixed effect estimator. We carried out a Hausman test that indicated correlation between individual effects and independent variables. In the light of this, the fixed effect is best suited than the between effects. As well as the individual effects added to control for the cross- reference units, we have also included time dummies in our model. With these temporal effects we reduce a source of bias by capturing the events that all states were subjected to in a given year. An F test of significance was performed to assert the joint significance of the temporal dummies and the result was that they contribute to the model overall's significance. We have also applied the Wooldridge and Modified Wald tests to examine potential autocorrelation in our panel and heteroskedasticity problems in our fixed effect equation. In all cases the results were positive. Consistent with Beck and Katz (1995), we have corrected both problems using panel corrected standard errors through a Prais-Winsten regression.

TABLE 1- Descriptive statistics and Correlations matrix [a]

	Variable	Mean	S.D.	Correlations					
				1	2	3	4	5	6
1	Tobin's q	2.29	1.82						
2	Innovation with high social benefit	0.09	0.28	-0.07**					
3	Industry innovation leader	0.08	0.28	0.10**	0.08**				
4	R&D intensity	25.09	36.53	0.29**	-0.11**	0.04*			
5	CSR	0.28	0.59	0.14**	0.21**	0.27**	0.06**		
6	Risk	1.12	0.47	-0.24**	-0.02	-0.04*	-0.17**	-0.11**	
7	Size	14.73	1.62	-0.09**	0.06**	0.11**	-0.08**	0.28**	-0.01

[a] n = 2025. *p<0.05; **p<0.01

Table 1 provides descriptive statistics and correlation matrices for the variables. To test for multicollinearity, we checked the correlation matrix and variance inflation factors (VIFs) of the regression models on both pooled data and individual years of data. We found that all VIFs were smaller than 3. On table 1 we can observe that CFP has a negative significant correlation with Innovation with high social benefit, along with a positive significant correlation with innovation leader. We can also see, that R&D intensity has a positive significant correlation with innovation leader, although has a negative significant correlation with Innovation with high social benefit, as predicted by the literature, that the high R&D intensity not compulsory generate social benefit. Furthermore, the overall CSR proxy is significant and positively correlates to all our models variables, except with risk which has a significant and negative correlation.

TABLE 2 - Results of Regression Analyses

	01	02	03
Innovation with high social benefit		-0.3474**	
		(0.1080)	
Industry innovation leader			0.3494†
			(0.2123)
R&D intensity	0.0086**	0.0083**	0.0086**
	(0.0019)	(0.0019)	(0.0019)
CSR	0.1857**	0.2093**	0.1566*
	(0.0700)	(0.0719)	(0.0723)
Risk	-0.5143**	-0.5128 **	-0.5073**
	(0.1098)	(0 .1102)	(0.1098)
Size	-0.1676**	-0.1668**	-0.1723**
	(0.0369)	(0.0369)	(0.0376)
Constant	5.0303**	5.0388**	5.0928**
	(0.6326)	(0.6332)	(0.6412)
Wald chi2	317.55	320.18	316.98
R2	0.2509	0.2559	0.2558

n=2025. †p<0.10; *p<0.05; **p<0.01

Regression coefficients are shown in the table. Standard deviations are in parentheses
Estimation also includes dummy for the years (1997-2007) and for industry.

Table two shows the three models we developed in our research. Our first model shows the effect that the control variables have on our dependent variable, corporate financial performance, our second model reflects the effect that innovation with high social benefit has on the corporate financial performance of the firm and our third model reflects the effect that being an innovation leader has on corporate financial performance of the firm. The results of the regression analyses provide support to reject Hypothesis 1, as they indicate that innovation

with high social impact has a negative effect on financial performance ($p < 0.01$). On the other hand, Hypothesis 2 is supported, since we found that innovation leader has a positive effect on financial performance ($p < 0.10$). We controlled for R&D intensity, CSR, firm risk, firm size and industry. The results show that R&D intensity is significant and positively associated with CFP ($p < 0.01$) in all models, furthermore CSR overall proxy is significant and positively associated with CFP ($p < 0.05$) in our first and second model, and at ($p < 0.1$) in our third model. In addition the control variables firm risk and size are both significant and negatively associated to CFP ($p < 0.05$) in all models.

5. – DISCUSSION AND CONCLUSION

As we mentioned before, this article has the objective of analyzing the effect that innovations with high social benefits have on financial performance, and to enhance the understanding of this effect we extend our research by analyzing the relationship between being an innovation leader and financial performance, with the intention of observing the behaviour of different innovation strategy effects on corporate financial performance.

To establish our theoretical framework, we combined the RBV theory with the institutional theory which allowed us to analyze resource selection and accumulation, looking at market imperfections, such as barriers to acquisition, imitation, and substitution of key resources or inputs (Barney, 1991; Penrose, 1959; Schoemaker and Amit, 1994), and the social context within which resource selection decisions are embedded, such as firm tradition and regulation pressures, and how this context might influence sustainable differences (Oliver, 1997; Ginsberg, 1994). Drawing on both theories in our research, strengthened the idea that resource selection and sustainable competitive advantage are profoundly influenced, by the

firm's circumstances, such as rules, norms, and beliefs surrounding economic activities that define or enforce socially acceptable economic behaviors taken into account for resource decisions (Oliver, 1997).

The results of this research demonstrates that innovation with high social benefit has a negative effect on financial performance, which provides support to reject our first hypothesis that states that there is a positive effect between these two variables. Even though, innovation with high social benefit does not impact positively on financial performance, we assume based on Doh, et al. (2010) that it can generate legitimacy which leads to good reputation.

According to Godfrey (2005), reputation in and of itself has no cash value, but it may generate economic value in the long term. This suggests that firms that are performing this type of innovations are not obtaining immediate financial benefits. This is a sign for Governmental and Non-governmental institutions so that they can provide incentives to firms so that they continue performing this kind of innovations that provide benefits towards society and in the long run obtain financial profit. Further research could be done on this topic to determine which kind of innovations with social benefit do have positive financial returns on a shorter term, like Hart and Ahuja (1996) have found when studying the reduction of emissions and firm performance, where they determined that it does pay to be green and innovate to reduce emissions. Also, King and Lennox (2001), found that lower pollution has a positive effect on higher financial valuation but this result depends on firm's fixed characteristics and strategic position, and propose that instead of asking the question "Does it pay to be green? is a less important question than When does it pay to be green?". Furthermore, other researchers have argued that it is important for firms to look beyond their narrow focus of social responsibility and take social concern into consideration in strategic management decisions, since social

actions will ensure business interests in the long term by creating a close relationship with their community (Quazi and O'Brien, 2000)

Furthermore, our results demonstrated that being an innovation leader does have a positive impact on financial performance, in line with Lev, et.al. (2006). As Barney (1991), Grant (1991) and Roberts and Dowling (2002) have stated, resources cause leaders to differentiate themselves from followers, and it is difficult for followers to achieve competitive advantage because the resources that leaders possess are usually rare and difficult to replicate, allowing them to sustain a superior financial performance.

The academic value of this research is that it has provided a greater understanding of this subject, since to our knowledge there has been no other study that focuses on the effect that innovation with high social benefit has on financial performance. In addition, our model was estimated using panel data techniques, which are better capable of controlling for inherent heterogeneity than a simple regression. Also, our research opens other research questions, such as: which activities under innovation with high social benefit can be profitable to the firm in the short term, what circumstances and characteristics the firms need to posses in order to obtain a profit from this type of activities.

Regarding managerial value, this study provides information to firms, about what to expect when doing innovation with high social benefit. As we have mentioned before, even though the relationship between these two variables is negative, probably there are other benefits that can be obtained from innovation with high social benefit. Some of the benefits obtained in the long run from innovation with social benefit may create legitimacy when attending to stakeholders demand for innovative actions that provide a benefit to society. Finally, our results suggested that in a short period of time, being a leader in innovation has a better impact on financial performance than having innovation with high social benefit.

Even though the innovation with social benefit variable in the analysis was build on the strength of the KLD data, there are certain limitations related to this, such as its binary nature and the fact that the underlying items refer to innovativeness to differing degrees. To overcome this limitation, future researches might use patent data and incorporate patent citations, as it is suggested in Wagner's (2010) research.

CHAPTER 4

THE IMPACT OF R&D INTENSITY ON CORPORATE REPUTATION: INTERACTION EFFECT OF INNOVATION WITH HIGH SOCIAL BENEFIT

1. – INTRODUCTION

Most successful companies like to position themselves and be identified as highly innovative and to be social responsible. Research seems to increasingly concur that CSR and R&D are complementary (Branco and Rodrigues, 2006; McWilliams and Siegel, 2000; Padgett and Galan, 2010) and that both influence positively the company's overall reputation (Chun, 2006). Although, little is known about how the link between social responsibility and R&D impacts on corporate reputation.

This article analyzes the effect that R&D Intensity, which has long been associated with the innovative capacities of firms (Anagnostopoulou and Levis, 2008), has on corporate reputation (CR), and how this effect can be positively moderated when innovation produces positive social actions. To support our analysis we will make use of the resource based view (RBV) and institutional theories. The RBV theory, recognizes the importance of intangible resources, making it ideal to study such variables as corporate reputation and research and development (R&D), since they are difficult to imitate and substitute and lead to competitive advantages (Branco and Rodriguez, 2006). According to Oliver (1997), in order to complement the RBV theory and analyze the social context of resources, it is necessary to include the institutional theory (DiMaggio and Powell, 1991; Scott, 1995), which examines the role of

social influences and pressures for social conformity in determining organizations' decisions and actions. The RBV and the institutional theories provide substantial support to the study of intangible resources plus add importance of how stakeholder pressures influence firms' decisions, which allows us to demonstrate the importance of R&D, social benefits obtained from this R&D activities and how these actions are perceived by stakeholders, creating a good reputation for firms that incur in it.

Our research is based on the idea that R&D activities that produce social benefits will obtain a greater positive effect on CR than R&D by itself, since R&D activities can produce innovations that do not produce any social benefit and thus, may not be perceived by stakeholders, which will result in a lower impact on the firm's reputation. On the other hand when innovation that produce social benefits are in the picture, stakeholders will perceive this effect and thus have a greater positive effect on the firm's CR.

Existing literatures, rarely link firm's social activities and innovation as key elements for a sustainable reputation, but there is one research by Chun (2006), which has studied the effect that R&D has on reputation. The research found that in order for firms to be innovative and have a good reputation, they need to be socially responsible. Even though this research studied the same effect that we are analyzing in this research, we provide a different focus since we include other variables such as innovation with high social benefit contributing to the literature in several different ways: first, we are studying the interaction between three variables that until now have not been studied in this way; second, our research gives insights to managers that if they want to improve their reputation with R&D activities, they might not achieve the desired results, since R&D alone may not have a positive influence on CR, but when a firm's R&D produces some kind of social benefit, then the firms' reputation will be positively affected;

third, our research adopted a panel data methodology, a technique that allows us to control the risk of unobserved heterogeneity on the manager's conceptions of social responsibility and company strategy (Bouquet and Deutsch, 2008).

The remainder of the paper is organized as follows: the second section reviews the RBV and institutional theory, the empirical evidence, and the hypothesis is presented; the third section describes the data and estimation method used in our analysis; the results are discussed in our fourth section and, finally, the fifth and last section presents our conclusions to this research.

2. – THEORY AND HYPOTHESES

Resource Based View and Institutional Theory

This article analyzes the impact that R&D Intensity has on CR, and how this effect is positively moderated by innovations with high social benefits. As a theoretical framework for this analysis we will make use of the RBV and institutional theories. The resource-based view (RBV) theory of strategic management (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984) examines resources and capabilities of firms, which enables them to obtain a competitive advantage and above average rates of return. According to the RBV, firms with assets that are valuable and rare possess a competitive advantage and may expect to earn superior returns, and those firms whose assets are also difficult to replicate may have a sustained superior financial performance (Barney, 1991; Grant, 1991; Roberts and Dowling, 2002). The RBV theory, recognizes the importance of intangible resources, making it ideal to study such variables as research and development (R&D), corporate social responsibility (CSR) and CR since they are

difficult to imitate and substitute and lead to competitive advantages (Branco and Rodriguez, 2006). The RBV is not only about internal competencies and how they can generate competitive advantages, since the firm is also affected by external factors, and "resources cannot be evaluated in isolation. A resource that is valuable in a particular industry or at a particular time might fail to have the same value in a different industry or chronological context" (Collis and Montgomery, 1995:120). According to Oliver (1997), in order to complement the RBV theory and analyze the social context of resources, it is necessary to include the institutional theory (DiMaggio and Powell, 1991; Scott, 1995), which examines the role of social influences and pressures for social conformity in determining organizations' decisions and actions. Furthermore the institutional theory predicts that firms adopt specific business behaviors to achieve access to resources and support of critical stakeholders (DiMaggio & Powell, 1983; Oliver, 1991; Scott, 1995; Tolbert & Zucker, 1983).

Within an institutional perspective, firms operate within a social framework of norms, values, and assumptions about appropriate or acceptable economic behavior (Oliver, 1997). The institutional view suggests that the motives of human behavior extend beyond economic optimization to social justification and social obligation (Zukin and DiMaggio, 1990). According to institutional theorists, conformity to social expectations contributes to organizational success and survival (Baum and Oliver, 1991; Carroll and Hannan, 1989; DiMaggio and Powell, 1983; Oliver 1991). Scott (1987:498) adds to this statement when he observes that organizations "conform because they are rewarded for doing so through increased legitimacy, resources, and survival capabilities".

The main argument of institutional theory, is that "firms' tendencies towards conformity with predominant norms, traditions, and social influences in their internal and external

environments lead to homogeneity among firms in their structures and activities, and that successful firms are those that gain support and legitimacy by conforming to social pressures" (Oliver, 1997:700). Legitimate organizations meet and conform to societal expectations and as a result are accepted, valued, and taken for granted as right fitting, and good (Aldrich & Fiol, 1994; Meyer & Scott, 1983) and therefore, legitimacy results in attainment of a particular reputation (Doh et al, 2009).

Corporate Reputation and Research & Development (R&D)

Roberts and Dowling (2002) conceptualize reputation as a perceptual representation of a company's past actions and future prospects—describing the firm's overall appeal to key constituents compared with leading rivals. Organizational researchers, following the lead of economists, analyze issues of social identity under the rubric of reputation (Weigelt and Camerer, 1988) and depict it as a critical antecedent of organizational performance (Itami, 1987; Fombrun and Shanley, 1990; Hall, 1993). Reputation and legitimacy need not be viewed as competing specifications of organizational identity but are rather complementary aspects of creating an organizational identity (Rao, 1994). If reputation is based on signals and legitimacy flows from symbols, both signals and symbols are needed to create impressions on audiences (Goffman, 1969; Feldman and March, 1981). Fombrun and Shanley (1990: 233) mention that having a favorable reputation may lead to favorable consequences, such as the charging of premium prices to the customer, the attraction of better applicants and more investors.

Reputation has been identified as one of the most important intangible resources that provide a firm sustainable competitive advantage. In the resource-based view, resources are classified as tangible, intangible, and personnel-based (Grant, 1991). Tangible resources include financial reserves and physical resources such as plant, equipment, and stocks of raw

materials. Intangible resources include reputation, technology, and human resources; the latter include culture, the training and expertise of employees, and their commitment and loyalty. Roberts and Dowling (2002, p. 1091) argue that ‘‘the development of a good reputation takes considerable time, and depends on a firm making stable and consistent investments over time.’’ However, as with any valuable resource, it is the difficulty to create, trade, or imitate that explains the strategic value it has for the firm.

Fombrun and Shanley (1990) view corporate reputation as the result from a process in which firms compete for social status in a market characterized by incomplete information. However, a firm’s reputation is determined not only by the signals received directly from the firm but also from other sources, such as the media, stock market and stakeholders. A firm’s stakeholders are assumed to respond to market and accounting signals representing corporate performance, institutional signals about its visibility and socially responsibility, and strategy signals related to corporate postures such as differentiation and diversification. As Roberts and Dowling (2002, p. 1078) point out, CR ‘‘reflects the extent to which external stakeholders see the firm as ‘‘good’’ and not ‘‘bad’’.’’ Some scholars (Surroca et al, 2009; Orlitzky et al, 2003; Wood, 2010) maintain that the ‘‘reputational effects’’ of engaging in social practices provide the crucial link between social initiative and profitability and according to Quevedo-Puente et al., (2007), there is no controversy that corporate social performance influences firm’s reputation.

Other studies have focused on the relationship between firm performance and CR. According to Godfrey (2005), CR in and of itself has no cash value, but it may generate economic value. In an empirical research, Roberts and Dowling (2002) demonstrated that firms with strong positive reputations possess a cost advantage because, ceteris paribus, employees

prefer to work for high-reputation firms. At the same time, suppliers are less concerned about contractual hazards when transacting with high-reputation firms, good reputations should also lead to lower contracting and monitoring costs (Dyer and Chu, 2003). Moreover, high-reputation firms are perceived as providing more value, what often allows them to charge a higher price for their products, and their customers are more loyal (Keh and Xie, 2008). Under a financial perspective, the market beliefs that such companies deliver sustained earnings and future growth. Consequently, they enjoy higher price-earnings and market values, and lower costs of capital (Carter and Ruefli, 2006; Fombrun, 1996; Fombrun and Shanley, 1990; Roberts and Dowling, 2002).

As well as corporate reputation, it has been long argued that investment in R&D leads to improvements in long-run economic performance (Griliches, 1979). These results are robust to different time periods and levels of aggregation. For example, using data from over 2000 firms, Lichtenberg and Siegel (1991) report a strong positive correlation between R&D investment and growth in total factor productivity. Clark and Griliches (1984) find similar results at the line-of-business level. Several researches report similar positive associations between R&D, accounting profits, and long-term shareholder returns and other proxies for long-term financial performance, such as Ben-Zion (1984), who studied the relationship between R&D and firm's market value, Guerard, Bean, and Andrews (1987), who analyzed the interdependencies of the research and development, investment, dividend, and new debt financing decision, Guerard, Stone, and Andrews (1988), who studied R&D expenditures in an international economy, Griliches (1998), who studied R&D and productivity and Hall (1999), who studies innovation and market value.

Branco and Rodrigues (2006) state that innovations that can improve product quality is related with CR, because consumers perceive this product quality improvement. This statement is reinforced by Russo and Fouts (1997) research, which suggests that reputation effects and the ability to influence public policy by R&D activities for compliance standards enhances the competitive advantage of environmentally proactive firms. This study also demonstrates that firms that assume a proactive environmental policy often redesign and improve processes and physical resources, through R&D activities to enhance methods for waste reduction and operational efficiency.

Another research by Galaskiewicz's (1991) has stated that firms tend to act socially responsible when normative or cultural institutions create incentives for such behavior. The institutional theory supports the intentions of firms to participate in R&D activities because they attend to stakeholder pressures that call for innovation, and thus creating a good reputation (Quevedo-Puente et al., 2007). Organizational culture that emphasizes innovation will engender positive responses by employees. While the relationship between innovation and integrity could be a virtuous circle in which innovation in a company's social and business practices strengthens its reputation and the self-respect of its employees (Schwartz and Gibb, 1999), the competitive environment demands innovation and aggressiveness for global competitiveness and survival. Reputation of a company is shaped through developing virtuous character, innovativeness is the business virtue which leads to customer and employee satisfaction. (Chun, 2006)

Based on the above arguments, we therefore suggest the following hypothesis:

Hypothesis 1: R&D intensity positively affects corporate reputation.

Innovation with High Social Benefit

A recent research by Wagner (2010) analyzes the link between innovation with high social benefits and corporate social performance. The author describes how firms can do innovation that produces private benefits, such as improved products, creating advantages to the firm. Also, these innovations can produce social benefits, such as process improvements that reduce pollution. The author establishes that innovation should have an equilibrium where companies are encouraged to innovate because they will obtain higher rents and at the same time give something to society. According to Wagner (2010), innovation with high social benefits can be defined as an innovation that has a positive direct social effect, such as reduced environmental externalities and provision of products or services for the economically disadvantaged.

Several researchers have found a link between innovation and CSR. For example, McWilliams and Siegel (2000) demonstrate, innovation is a significant driver of firm performance, and when innovation is included among the independent variables the significance of the CSR-financial performance relationship disappears. Also, they prove that CSR is positively correlated with R&D intensity. Another research by Hull and Rothenberg (2008), corroborate this finding and finally Padgett and Galan (2010) study the relationship between these two variables and found a significant positive effect. Fombrun and Shanley (1990) established that investing in CSR attributes and activities may be important elements of product differentiation and reputation building. McWilliams et.al., (2006) expands this statement by giving the example where consumers prefer products with a CSR characteristic, because they believe it is better than the product without such a characteristic. For example, a 'hybrid' version of a Honda Accord generates less pollution than a standard Honda Accord. In

this example, it is clear to most consumers that the hybrid car is better than the standard model. McWilliams et.al., (2006) state that vertical differentiation occurs when most consumers prefer one product to another, and this type of differentiation can strengthen or maintain the reputation of the firm which adds value in addition to allowing the firm to meet a particular market demand (Fombrun and Shanley, 1990).

McWilliams et. al, (2006) state that CSR can be an integral element of a firm's business and corporate-level differentiation strategies and therefore, it should be considered as a form of strategic investment, since CSR can be viewed as a form of reputation building. It is clear that such companies are likely to derive greater benefits from the use of CSR related innovation for reputation enhancement and/or protection. Other researchers, state that companies incur in social innovative actions because they obtain benefits in return, such as Scott's (1987) work where it is observed that organizations "play the game" because they are rewarded for doing so through increased legitimacy, resources and survival capabilities. Firms should see that by innovating with high social benefits firms create differentiation and legitimacy. The basic argument of the RBV theory is that rare, specialized, inimitable resources cause firm heterogeneity, and that successful firms are those that acquire and maintain valuable idiosyncratic resources for sustainable competitive advantage. If firms go one step further and conform to predominant norms, traditions, and social influences in their internal and external environments will gain support and legitimacy, according to the institutional theory (Oliver, 1997) and become successful at least over the long term (Jones, 1995). In addition, firm's legitimacy, leads to obtaining a good reputation (Doh, Howton, Howton and Siegel, 2009).

Furthermore there is a mutual dependence between corporations and society which implies that both business decisions and social actions must follow the principle of *shared*

value. Choices must benefit both sides, because if either businesses or society pursue actions that benefit their own interests at the expense of the other, they will find themselves on a risky path, where a momentary gain of one will weaken the long-term prosperity of both (Porter and Kramer, 2006). In interviews with senior managers in 14 successful European and American commercial organizations, Davies and Miles (1998) found that most firms promote core values as central to managing their reputation, and that these core values include reliability, caring, innovation, trust, social responsibility, honesty, integrity and fun. Additionally, they found that one of the cornerstones of reputation management is the social responsibility in the organizational culture of the firm. Existing literature rarely link CSR and innovation as key elements for a sustainable reputation even though these two elements influence CR as the statements above have implied.

Based on these insights, the following hypothesis can be stated:

Hypothesis 2: Innovation with high social benefit positively moderates the effect that R&D intensity has on corporate reputation.

3. – METHODS

Sample and data

The data was obtained from three sources: Thomson Reuters Datastream database, Kinder Lydenburg Domini (KLD) social rating data, and Fortune magazine's 'World's Most Admired Companies' survey data. It is made up of all those firms for data could be obtained. The final

sample is composed of 257 US firms is unbalanced and covers a four-year period from 2004 to 2007.

KLD database is a reliable source for CSR measures and has been widely used by previous researchers (see Orlitzky et al., 2003; Margolis et al., 2007; Wood, 2010). It comprises numerical assessments on thirteen categories. Seven of those relate to social responsibility qualitative issues' areas and the remaining six to engagement in controversial business. For the first set of dimensions, there is a subset of items regarded as strengths and concerns. The qualitative issues are: product issues; community relations; environmental issues; human rights; governance; employees' relations and diversity of the work force. The rating is a binary system, where 1 indicates the presence of this item and 0 its absence. Previous researchers have tailored this rating system for their own objectives. From this database we extracted the CSR measure and also innovation with high social impact proxy, we give more detail about these measures later.

Fortune magazine's 'World's Most Admired Companies' survey, our data to measure CR, is based on responses from executives, directors, and financial analysts and determines a reputation score from eight attributes ranked on 11-point scales from poor to excellent. In order to maintain data consistency, respondents rate firms from their own sectors, thereby assuring an informative perceptual result. These attributes are long-term investment value; financial soundness; wise use of corporate assets; community and environmental friendliness; quality of management; product quality; innovativeness; and ability to attract, develop, and keep talented people. Fortune's ratings remain the most widely used reputation construct in empirical research (Sabate and Puente, 2003); moreover, Fortune's data have the virtue of not being

highly correlated with Kinder Lydenburg Domini (KLD) social rating data (Szwajkowski and Figlewicz, 1999).

Measures

To measure CR, our dependent variable, we have used Fortune magazine's data survey. This is published annually in a March issue, and then we relate the reputation score of the current year with the data of precedent year. Due to the possible effect of past financial performance on reputation, the so-called halo effect, we regressed reputation on increasingly higher-order lags of return on asset (ROA) until no further significant improvement in R2 was observed (Roberts and Dowling, 2002). We found no significant increases in R2 beyond three lags. Hence the R2 was only 0.018, we adopt the reputation measure as the residual of reputation measure has a very similar behavior and decrease our dataset disabling our analyses. We adopt ROA as financial performance control variable as previous studies (e.g. Brammer and Pavelin, 2006; Turban and Greening, 1997). In addition, assuming the long-term effect of firms social issues on CR (Robert and Dowling, 2002), we have estimated the model with a two-year lag on the CR variable.

To measure innovation with high social benefits we follow Wagner (2010) and construct a proxy for it using three useful variables of the KLD database, those that are related with firms' innovation. The first variable is taken from by the strength environment issue qualitative area, called ENV-str-A by KLD, and this variable indicates that a firm has newly introduced products or services which protect the environment or is achieving significant sales with such innovative products or services because of its concern with protecting the environment. The second and third are taken from by the strength product issue qualitative area, the KLD database respectively names them as PRO-str-X and PRO-str-C. PRO-str-X measure whether a

firm's products have notable social benefits that are highly unusual or unique for its industry and PRO-str-C records whether part of a firm's mission is the provision of products or services for the economically disadvantaged. These three variables are binary and assume value 1 if the firms have this characteristic and 0 when they do not. Our variable innovation with high social benefits is the sum of these three variables.

To measure R&D intensity, we use a proxy of R&D, calculated by dividing total expenditure in R&D by total number of employees. This ratio is "less sensitive to the spurious effects of business cycles, accounting manipulations, and asset sales than R&D spending as a proportion of sales" (Baysinger, Kosnik and Turk, 1991:207), and is positively related to patents and product innovations (Hitt, Hoskisson and Kim, 1997).

We have used control variables based on the degree to which they may influence the effect that innovation with high social benefit and R&D intensity have on CR. We have used company size because previous articles have suggested it is closely related to CR (eg. Brammer and Pavelin, 2004), and we measure it as the total assets defined on a log scale. Risk is another factor used as a control variable in CR models. In line with Brammer and Pavelin (2006), we expect a negative relation between risk and reputation, as high business risk impacts negatively on CR (Fombrun and Shanley, 1990). Risk is measured as the ratio of total debt to total assets.

Therefore, for the purpose of this research it is also necessary to control the firms' overall social responsibility index. We used the five KLD dimensions consistently reported between 1996 and 2007: product issues; community relations; environmental issues; employees' relations and diversity of the work force. These dimensions have been selected because they reflect corporate attention to primary stakeholders with an impact on a firm's survival (Clarkson, 1995) and exert considerable influence on corporate strategy (Berman, Wicks,

Kotha, and Jones, 1999). We develop the same scale used by Hillman and Keim (2001), which is also used by other authors (e.g. Hull and Rothenberg, 2008). All of the strengths of each dimension are rated on a scale ranging from 0 to +2, in the same way all concerns of each dimension are rated from –2 to 0. Then, we add the strengths scale plus the concerns scale of each dimension, having as a result a scale ranging from –2 to +2. We build the corporate social responsibility measure giving equal weights to the five dimensions cited above. (Hillman and Keim, 2001).

In addition to these variables, a control needs to be made of the controversial business involvement (CBI) impact. According to Dowling (2004) the CBI by firms may have a negative effect on their reputation. In order to measure it, we focus on the KLD dimension concerning firm operations related to alcohol, tobacco, gambling, firearms, nuclear power and military contracting. These CBI ratings differ from the corporate social performance ones described earlier, as they are rated as 'concerns' only. For each concern, we give 0 to indicate its avoidance and 1 to indicate involvement. We have given equal importance to the categories adopted from KLD to construct this measure.

Finally, it may be that, even controlling for financial performance and all the other firm attributes we have discussed, reputation varies systematically across sectors (Brammer and Pavelin, 2004; 2006; Dowling, 2004). Some business activities may predispose a firm to a better reputation than other activities. To avoid this bias, we have used dummy variables based on the DataStream industry classification. Accordingly, we allocated each firm to one of twelve sectors: basic industries, cyclical consumer goods, cyclical services, general industries, information technology, non-cyclical goods, non-cyclical services, resource, financial and utilities.

4. – RESULTS

We used the panel data technique to estimate our models. Unlike cross-sectional analysis, panel data analysis allows us to control every firm and has its own specificity that gives rise to a particular behaviour closely linked to the company's strategy. Unobserved variables can be eliminated by specifying a fixed-effects or a random-effects model, as several sequential (yearly) observations of the same company are recorded.

We carried out a Hausman test that indicated correlation between individual effects and independent variables. In the light of this, the fixed effect is best suited than the between effects. As well as the individual effects added to control for the cross- reference units, we have also included time dummies in our model. With these temporal effects we reduce a source of bias by capturing the events that all states were subjected to in a given year. An F test of significance was performed to assert the joint significance of the temporal dummies and the result was that they contribute to the model overall's significance. We have also applied the Wooldridge and Modified Wald tests to examine potential autocorrelation in our panel and heteroskedasticity problems in our fixed effect equation. In all cases the results were positive. Consistent with Beck and Katz (1995), we have corrected both problems using panel corrected standard errors through a Prais-Winsten regression.

TABLE 1 - Descriptive statistics and Correlations matrix [a]

	Variable	Mean	s.d.	1	2	3	4	5	6	7
1	CR	6.35	1.04							
2	Innovation with high social benefit	0.12	0.33	0.10*						
3	R&D intensity	0.04	0.06	-0.03	0.03					
4	Corporate social responsibility	0.40	0.76	0.16*	0.24*	0.37*				
5	CBI	0.20	0.44	0.02	0.09	-0.08	-0.05			
6	Tobin q	1.78	1.02	0.24*	-0.01	-0.34*	0.28*	-0.12*		
7	Risk	0.22	0.15	-0.05	0.04	-0.21*	-0.05	0.13*	-0.30*	
8	Size	16.09	1.29	0.34*	0.12*	0.14*	0.14*	0.14*	-0.07	0.14*

[a] n = 706. *p≤0.05; **p≤0.01

Table 1 provides descriptive statistics and correlation matrices for the variables. To test for multicollinearity, we checked the correlation matrix and variance inflation factors (VIFs) of the regression models on both pooled data and individual years of the data. We found that all VIFs were lower than 3. Table 1 show that corporate reputation (CR) has a positive significant correlation with innovation with high social benefits and CSR. As predicted by the literature, these results support the positively association between firms social issues and CR. We can also see that R&D intensity and CBI have no significant correlation with CR.

Table 2 presents the results of the regression analyses. Our first model shows the effect that the control variables have on our dependent variable, CR and has an R-squared of 0.6467. We controlled for controversial business involvement (CBI), financial performance, R&D, firm risk, firm size, advertising intensity and sector. The results show that CBI is not significantly associated with in all of our. Firm size is significantly and positively associated with CR ($p < 0.01$) in all models, consistent with Brammer and Pavelin (2004). Furthermore, there is a significant effect of Tobin's q, risk and size on CR in all of our models, like prior studies have supported these significant relationships.

Our second model, shows the effect that R&D intensity has on CR, it has an R-squared of 0.6461 and the results demonstrated that R&D intensity affects CR negatively at a $p<0.10$,

although we expected an opposite result, thus giving proof to reject our first hypothesis. Our third model has an R-squared of 0.6395, and shows that innovation with high social benefit does not have a significant effect on CR. Finally our fourth model, studies how innovation with high social benefit moderates the effect that R&D intensity has on CR. Our fourth model has an R-squared of 0.6395, and as can be seen, the moderating effect that Innovation with high social benefit has on the impact that R&D intensity has on corporate reputation is significant and positive at a $p<0.10$, which provides support for Hypothesis 2. Our third and fourth models display that there is no significance in the effect that innovation with high social benefits has over CR.

TABLE 2 - Results of Regression Analyses (Corporate Reputation – dependent variable)

Variables	**Model 01**	**Model 02**	**Model 03**	**Model 04**
Innovation with high social benefit * R&D intensity				3.7876*
				(2.2781)
Innovation with high social benefit			0.1376	-0.0349
			(0.0993)	(0.1255)
R&D intensity		-1.6328*	-1.6367*	-1.8571*
		(0.8938)	(0.8860)	(0.8896)
Corporate social responsibility	0.1124*	0.1210*	0.1060*	0.1075*
	(0.0556)	(0.0554)	(0.0584)	(0.0582)
CBI	0.0580	-0.0447	0.0483	0.0412
	(0.0909)	(0.0898)	(0.0889)	(0.0902)
Tobin q	0.2687***	0.2801***	0.2830***	0.2851***
	(0.0397)	(0.0403)	(0.0401)	(0.0403)
Risk	-0.4387***	-0.4365***	-0.4336***	-0.4382***
	(0.0773)	(0.0774)	(0.0768)	(0.0767)
Size	0.3109***	0.3201***	0.3191***	0.3199***
	(0.0363)	(0.0362)	(0.0359)	(0.0360)
_cons	1.2270*	1.0698	1.0661	1.0636
	(0.7162)	(0.7141)	(0.7091)	(0.7098)
R-squared	0.6467	0.6461	0.6365	0.6395
Wald chi2	(16) 260.33	(17) 270.48	(18) 280.03	(19) 282.96

Estimation also includes dummy for the years (2005 - 2007) and for industry.
Standard errors in parentheses under the coefficients.
n = 703. *p≤0.10; **p≤0.05;* **p≤0.01

5. – DISCUSSION AND CONCLUSION

The resource based view and the institutional theories allowed us to analyze the effect that R&D intensity has on CR, and how this effect is positively moderated by innovations with high social benefits. The RBV theory, recognizes the importance of intangible resources, making it ideal to study such variables as research and development (R&D), corporate social responsibility (CSR) and corporate reputation (CR) since they are difficult to imitate, substitute and lead to competitive advantages (Branco and Rodriguez, 2006). Even though the RBV is a prime example of a theory that integrates a management perspective with an economics perspective (Peteraf and Barney, 2003), Oliver (1997) states that in order to complement the RBV theory and analyze the social context of resources, it is necessary to include the institutional theory. The combination of both the RBV and the institutional theories provide substantial support to the study of intangible resources plus add importance to stakeholder pressures, and how they influence firms' decisions. Both theories have allowed us to demonstrate the importance of R&D, the social benefits obtained from R&D activities and how these actions are perceived by stakeholders, which might create a good reputation for firms that incur in R&D activities.

The results of this research demonstrates that R&D intensity has a negative effect on CR, which provides support to reject our first hypothesis, which states that there is a positive effect between these two variables, giving us the conclusion that not every type of innovation can improve or have a positive influence on CR. Further research might be needed to determine which kinds of innovations can have a positive impact on CR. What is clear is that if R&D's outcomes produce some kind of social benefit, then the impact that it has on CR will be positive, as our results demonstrated. Innovation with high social benefit moderates in a

positive way the effect that R&D intensity has on CR, thus supporting our second hypothesis. R&D with the moderation of innovation with high social benefits will produce a greater positive effect on CR than R&D by itself, since R&D activities can produce innovations that do not produce any social benefit which may not be perceived by stakeholders. Because of this reason, R&D by itself may have a lower impact on the firm's reputation. On the other hand when innovation with social benefit is in the equation, stakeholders will perceive this effect and thus have a greater positive effect on the firm's CR.

Existing literatures, rarely link firms' social activities and innovation as key elements for a good reputation, and through this research we have found that the interaction between a firm's social activities and innovation is needed to obtain a good reputation. Recently several studies have seen that R&D is related with CSR and that it is important to include both variables when studying financial performance. Our research is novel in the sense that we are applying the same logic but studying the relationship with CR, which has been scarcely talked about in existing literature. In this way, our research is trying to fill this gap in literature, by providing evidence that innovations that produce social benefit moderate the effect that R&D has on CR. Our research contributes to the literature in other different ways: first, we are studying the interaction between three variables (R&D intensity, Innovations with high social benefit and CR) that until now have not been studied in this way, giving insight to the effect that R&D has on CR when moderated by innovations with high social benefit. Second, our research adopted a panel data technique, which allows us to control the risk of unobserved heterogeneity on the manager's conceptions of social responsibility and company strategy (Bouquet and Deutsch, 2008).

The managerial value of our research, gives insights to firms that are seeking to improve their reputation through R&D activities, letting them know that they might not achieve the desired results, since R&D alone may not have a positive influence on corporate reputation, but when a firm's R&D produces some kind of innovation with social benefit, then the firms' reputation will be positively affected. Innovative firms should focus their efforts on identifying opportunities in their R&D processes to initiate related CSR activities that could help them build a good reputation, which in the long run can give them a competitive advantage and profitable results. In addition, to having a synergy between CSR and innovation strategies, firms should make an effort to ensure that they "are a part of a larger society with a wider responsibility reaching beyond the narrow perspective of profit" (Quazi and O'Brien, 2000:33), which is an opportunity for building a sustainable relationship with stakeholders (Polonsky et al., 1997; Quazi and O'Brien, 2000).

For future researches it might be interesting to determine which types of R&D activities produce a positive effect on CR and what other variables could moderate this relationship. Also, it would be interesting to study the context where the firms are located, such as the type of industry they are in.

CHAPTER 5

CONCLUSIONS

The purpose of this thesis is to answer some questions that at moment have no consensual response on corporate social responsibility literature, focusing on providing knowledge of the relationship between corporate social responsibility and research and development. The contributions of this thesis are addressed on three empirical analyses chapters. On the following lines the readers can review the main conclusions of each part of this thesis.

On Chapter 2 our first hypothesis is supported, which states that R&D intensity affects CSR in a positive way. Previous research has shown that these two variables behave differently depending on the industry they are in. Consistent with this, we decided to test this effect in both manufacturing and non-manufacturing industries. Our results show that the effect that R&D intensity has on CSR is positive and significant in manufacturing industries, while in non-manufacturing industries R&D intensity has no significant effect on CSR. This finding shows that firms in industries with a higher intensity of R&D also devote efforts to CSR activities. This result might be explained due to the fact that manufacturing industries are under more pressures from stakeholders and government policies to carry out CSR activities. Even if this might be true, not every firm incurs in CSR activities due to government and stakeholder pressures, some firms always choose to exceed stakeholder expectations and policies by engaging CSR actions that minimise waste and reduce energy consumption, and by initiating progressive human resource management programmes (Chapple, Morrison and Harris, 2004).

The academic value of this research is that it has filled a gap in the literature, since to our knowledge there has been no other study that focuses on understanding the direct effect that R&D intensity has on CSR as we proposed. Furthermore, the results of this study enforce previous research that states the importance of taking R&D intensity into consideration when studying the relationship between CSR and a firm's financial performance.

Also, this study offers some managerial value to firms. It is important for firms to take their R&D activities into consideration when developing their CSR strategy, since process and product innovations may already be involved in CSR activities. Thus, innovative firms should focus their efforts on identifying opportunities in their R&D processes to initiate related CSR activities. This will allow the company to manage costs more effectively and determine whether other CSR activities might be necessary to meet stakeholder expectations. This is important for managers following differentiation strategies by investing in R&D and CSR, since they are related activities that provide a firm with a competitive advantage.

On Chapter 3 it is demonstrated that innovation with high social benefit has a negative effect on financial performance, which provides support to reject our first hypothesis that states that there is a positive effect between these two variables. Even though, innovation with high social benefit does not impact positively on financial performance, we assume based on Doh, et al. (2010) that it can generate legitimacy which leads to good reputation.

According to Godfrey (2005), reputation in and of itself has no cash value, but it may generate economic value in the long term. This suggests that firms that are performing this type of innovations are not obtaining immediate financial benefits, which is a sign for Governmental and Non-governmental institutions so that they can provide incentives to firms so that they continue performing this kind of innovations that provide benefits towards society and in the

long run obtain financial profit. Further research could be done on this topic to determine which kinds of innovations with social benefit do have positive financial returns on a shorter term. Furthermore, our results demonstrated that being an innovation leader does have a positive impact on financial performance, in line with Lev, et.al. (2006).

The academic value of this research is that it has provided a greater understanding of this subject, since to our knowledge there has been no other study that focuses on the effect that innovation with high social benefit has on financial performance. Also, our research opens other research questions, such as: which activities under innovation with high social benefit can be profitable to the firm in the short term, what circumstances and characteristics the firms need to posses in order to obtain a profit from this type of activities.

Additionally, the results from this chapter provide some managerial value, providing information to firms about what to expect when doing innovation with high social benefit. As we have mentioned before, even though the relationship between these two variables is negative, probably there are other benefits that can be obtained from innovation with high social benefit. Some of the benefits obtained in the long run from innovation with social benefit may create legitimacy when attending to stakeholders demand for innovative actions that provide a benefit to society. Furthermore, our results suggested that in a short period of time, being a leader in innovation has a better impact on financial performance than having innovation with high social benefit.

Finally, on chapter 4 it is demonstrated that R&D intensity has a negative effect on CR, which provides support to reject our first hypothesis, which states that there is a positive effect between these two variables, giving us the conclusion that not every type of innovation can improve or have a positive influence on CR. Further research might be needed to determine which kinds of innovations can have a positive impact on CR. Furthermore, our results

demonstrated that if R&D's outcomes produce some kind of social benefit, then the impact that it has on CR will be positive. Our second hypothesis is supported, since it stated that innovation with high social benefit moderates in a positive way the effect that R&D intensity has on CR.

Our research is novel and tries to fill a gap in CSR literature, by providing evidence that innovations that produce social benefit moderate the effect that R&D has on CR. Our research contributes to the literature in other different ways: first, we are studying the interaction between three variables (R&D intensity, Innovations with high social benefit and CR) that until now have not been studied in this way, giving insight to the effect that R&D has on CR when moderated by innovations with high social benefit. Second, our research adopted a panel data technique, which allows us to control the risk of unobserved heterogeneity on the manager's conceptions of social responsibility and company strategy (Bouquet and Deutsch, 2008).

The managerial value of our research, is that it provides insights to firms that are seeking to improve their reputation through R&D activities, letting them know that they might not achieve the desired results, since R&D alone may not have a positive influence on corporate reputation, but when a firm's R&D produces some kind of innovation with social benefit, then the firms' reputation will be positively affected. Innovative firms should focus their efforts on identifying opportunities in their R&D processes to initiate related CSR activities that could help them build a good reputation, which in the long run can give them a competitive advantage and profitable results.

All of the results obtained in each chapter of this thesis contribute significant knowledge to CSR and R&D literature. Also, they create other opportunities for further researches as was mentioned on each chapter's conclusion. We hope that this thesis has been an important

stepping-stone towards new exploration in CSR and R&D research that can deeply improve our understanding of the relationship between business and society.

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Appendix A – KLD Indicator Variables

QUALITATIVE ISSUE AREAS

COMMUNITY (COM-)

STRENGTHS

Charitable Giving (COM-str-A). The company has consistently given over 1.5% of trailing three-year net earnings before taxes (NEBT) to charity, or has otherwise been notably generous in its giving. In 2002, KLD renamed the Generous Giving Strength as Charitable Giving.

Innovative Giving (COM-str-B). The company has a notably innovative giving program that supports non-profit organizations, particularly those promoting self-sufficiency among the economically disadvantaged. Companies that permit non-traditional federated charitable giving drives in the workplace are often noted in this section as well.

Non-US Charitable Giving (COM-str-F). The company has made a substantial effort to make charitable contributions abroad, as well as in the U.S. To qualify, a company must make at least 20% of its giving, or have taken notably innovative initiatives in its giving program, outside the U.S.

Support for Housing (COM-str-C). The company is a prominent participant in public/private partnerships that support housing initiatives for the economically disadvantaged, *e.g.*, the National Equity Fund or the Enterprise Foundation.

Support for Education (COM-str-D). The company has either been notably innovative in its support for primary or secondary school education, particularly for those programs that benefit the economically disadvantaged, or the company has prominently supported job-training programs for youth. In 1994, KLD added the Support for Education Strength.

Indigenous Peoples Relations (COM-str-E). The company has established relations with indigenous peoples in the areas of its proposed or current operations that respect the sovereignty, land, culture, human rights, and intellectual property of the indigenous peoples. KLD began assigning this strength in 2000. In 2002 KLD moved this strength rating into the Human Rights area.

Volunteer Programs (COM-str-G). The company has an exceptionally strong volunteer program. In 2005, KLD added the Volunteer Programs Strength.

Other Strength (COM-str-X). The company has either an exceptionally strong in-kind giving program or engages in other notably positive community activities.

CONCERNS

Investment Controversies (COM-con-A). The company is a financial institution whose lending or investment practices have led to controversies, particularly ones related to the Community Reinvestment Act.

Negative Economic Impact (COM-con-B). The company's actions have resulted in major controversies concerning its economic impact on the community. These controversies can include issues related to environmental contamination, water rights disputes, plant closings, "put-or-pay" contracts with trash incinerators, or other company actions that adversely affect the quality of life, tax base, or property values in the community.

Indigenous Peoples Relations (COM-con-C). The company has been involved in serious controversies with indigenous peoples that indicate the company has not respected the sovereignty, land, culture, human rights, and intellectual property of indigenous peoples. KLD began assigning this concern in 2000. In 2002 KLD moved this strength rating into the Human Rights area.

Tax Disputes (COM-con-D). The company has recently been involved in major tax disputes involving Federal, state, local or non-U.S. government authorities, or is involved in controversies over its tax obligations to the community. In 2005, KLD moved Tax Disputes from Corporate Governance to Community.

Other Concern (COM-con-X). The company is involved with a controversy that has mobilized community opposition, or is engaged in other noteworthy community controversies.

CORPORATE GOVERNANCE (CGOV-)

In 2002 KLD renamed the Other category to Corporate Governance in order to better communicate the intent and content of these ratings.

STRENGTHS

Limited Compensation (CGOV-str-A). The company has recently awarded notably low levels of compensation to its top management or its board members. The limit for a rating is total compensation of less than $500,000 per year for a CEO or $30,000 per year for outside directors.

Ownership Strength (CGOV-str-C). The company owns between 20% and 50% of another company KLD has cited as having an area of social strength, or is more than 20% owned by a firm that KLD has rated as having social strengths. When a company owns more than 50% of

another firm, it has a controlling interest, and KLD treats the second firm as if it is a division of the first.

Transparency Strength (CGOV-str-D). The company is particularly effective in reporting on a wide range of social and environmental performance measures, or is exceptional in reporting on one particular measure. In 2006, KLD added the Transparency Strength, which incorporates information from the former Environment: Communications Strength (ENV-str-E) as part of its content.

Political Accountability Strength (CGOV-str-E). The company has shown markedly responsible leadership on public policy issues and/or has an exceptional record of transparency and accountability concerning its political involvement in state or federal-level U.S. politics, or in non-U.S. politics. In 2006, KLD added the Political Accountability Strength.

Other Strength (CGOV-str-X). The company has a unique and positive corporate culture, or has undertaken a noteworthy initiative not covered by KLD's other corporate governance ratings.

CONCERNS

High Compensation (CGOV-con-B). The company has recently awarded notably high levels of compensation to its top management or its board members. The limit for a rating is total compensation of more than $10 million per year for a CEO or $100,000 per year for outside directors.

Ownership Concern (CGOV-con-F). The company owns between 20% and 50% of a company KLD has cited as having an area of social concern, or is more than 20% owned by a firm KLD has rated as having areas of concern. When a company owns more than 50% of another firm, it has a controlling interest, and KLD treats the second firm as if it is a division of the first.

Accounting Concern (CGOV-con-G). The company is involved in significant accounting related controversies. In 2006, KLD added the Accounting Concern.

Transparency Concern (CGOV-con-H). The company is distinctly weak in reporting on a wide range of social and environmental performance measures. In 2006, KLD added the Transparency Concern.

Political Accountability Concern (CGOV-con-I). The company has been involved in noteworthy controversies on public policy issues and/or has a very poor record of transparency and accountability concerning its political involvement in state or federal level

U.S. politics, or in non-U.S. politics. In 2006, KLD added the Political Accountability Concern.

Other Concern (CGOV-con-X). The company is involved with a controversy not covered by KLD's other corporate governance ratings.

DIVERSITY (DIV-)

STRENGTHS

CEO (DIV-str-A). The company's chief executive officer is a woman or a member of a minority group.

Promotion (DIV-str-B). The company has made notable progress in the promotion of women and minorities, particularly to line positions with profit-and-loss responsibilities in the corporation.

Board of Directors (DIV-str-C). Women, minorities, and/or the disabled hold four seats or more (with no double counting) on the board of directors, or one-third or more of the board seats if the board numbers less than 12.

Work/Life Benefits (DIV-str-D). The company has outstanding employee benefits or other programs addressing work/life concerns, *e.g.*, childcare, elder care, or flextime. In 2005,

KLD renamed this strength from Family Benefits Strength.

Women & Minority Contracting (DIV-str-E). The company does at least 5% of its subcontracting, or otherwise has a demonstrably strong record on purchasing or contracting, with women- and/or minority-owned businesses.

Employment of the Disabled (DIV-str-F). The company has implemented innovative hiring programs; other innovative human resource programs for the disabled, or otherwise has a superior reputation as an employer of the disabled.

***Gay & Lesbian Policie*s (DIV-str-G).** The company has implemented notably progressive policies toward its gay and lesbian employees. In particular, it provides benefits to the domestic partners of its employees. In 1995, KLD added the Gay & Lesbian Policies Strength, which was originally titled the Progressive Gay/Lesbian Policies strength.

Other Strength (DIV-str-X). The company has made a notable commitment to diversity that is not covered by other KLD ratings.

CONCERNS

Controversies (DIV-con-A). The company has either paid substantial fines or civil penalties as a result of affirmative action controversies, or has otherwise been involved in major controversies related to affirmative action issues.

Non-Representation (DIV-con-B). The company has no women on its board of directors or among its senior line managers.

Other Concern (DIV-con-X). The company is involved in diversity controversies not covered by other KLD ratings.

EMPLOYEE RELATIONS (EMP-)

STRENGTHS

Union Relations (EMP-str-A). The company has taken exceptional steps to treat its unionised workforce fairly. KLD renamed this strength from Strong Union Relations.

No-Layoff Policy (EMP-str-B). The company has maintained a consistent no-layoff policy.

KLD has not assigned strengths for this issue since 1994.

Cash Profit Sharing (EMP-str-C). The company has a cash profit-sharing program through which it has recently made distributions to a majority of its workforce.

Employee Involvement (EMP-str-D). The company strongly encourages worker involvement and/or ownership through stock options available to a majority of its employees; gain sharing, stock ownership, sharing of financial information, or participation in management decision-making.

Retirement Benefits Strength (EMP-str-F). The company has a notably strong retirement benefits program. KLD renamed this strength from Strong Retirement Benefits.

Health and Safety Strength (EMP-str-G). The company has strong health and safety programs.

Other Strength (EMP-str-X). The company has strong employee relations initiatives not covered by other KLD ratings.

CONCERNS

Union Relations (EMP-con-A). The company has a history of notably poor union relations. KLD renamed this concern from Poor Union Relations.

Health and Safety Concern (EMP-con-B). The company recently has either paid substantial fines or civil penalties for willful violations of employee health and safety standards, or has been otherwise involved in major health and safety controversies.

Workforce Reductions (EMP-con-C). The company has made significant reductions in its workforce in recent years.

Retirement Benefits Concern (EMP-con-D). The company has either a substantially under funded defined benefit pension plan, or an inadequate retirement benefits program. In 2004, KLD renamed this concern from Pension/Benefits Concern.

Other Concern (EMP-con-X). The company is involved in an employee relations controversy that is not covered by other KLD ratings.

ENVIRONMENT (ENV-)

STRENGTHS

Beneficial Products and Services (ENV-str-A). The company derives substantial revenues from innovative remediation products, environmental services, or products that promote the efficient use of energy, or it has developed innovative products with environmental benefits. (The term "environmental service" does not include services with questionable environmental effects, such as landfills, incinerators, waste-to-energy plants, and deep injection wells.)

Pollution Prevention (ENV-str-B). The company has notably strong pollution prevention programs including both emissions reductions and toxic-use reduction programs.

Recycling (ENV-str-C). The company either is a substantial user of recycled materials as raw materials in its manufacturing processes, or a major factor in the recycling industry.

Clean Energy (ENV-str-D). The company has taken significant measures to reduce its impact on climate change and air pollution through use of renewable energy and clean fuels or through energy efficiency. The company has demonstrated a commitment to promoting climate-friendly policies and practices outside its own operations. KLD renamed the Alternative Fuels strength as Clean Energy Strength.

Communications (ENV-str-E). The company is a signatory to the CERES Principles, publishes a notably substantive environmental report, or has notably effective internal communications systems in place for environmental best practices. KLD began assigning strengths for this issue in 1996, and then incorporated the issue with the Corporate Governance: Transparency rating (CGOV-str-D), which was added in 2005. In files prior to 2005, this column does not appear. In all spreadsheets it is incorporated into the Transparency rating.

Property, Plant, and Equipment (ENV-str-F). The company maintains its property, plant, and equipment with above average environmental performance for its industry. KLD has not assigned strengths for this issue since 1995.

Management Systems (ENV-str-G). The company has demonstrated a superior commitment to management systems through ISO 14001 certification and other voluntary programs. This strength was first awarded in 2006.

Other Strength (ENV-str-X). The company has demonstrated a superior commitment to management systems, voluntary programs, or other environmentally proactive activities.

CONCERNS

Hazardous Waste (ENV-con-A). The company's liabilities for hazardous waste sites exceed $50 million, or the company has recently paid substantial fines or civil penalties for waste management violations.

Regulatory Problems (ENV-con-B). The company has recently paid substantial fines or civil penalties for violations of air, water, or other environmental regulations, or it has a pattern of regulatory controversies under the Clean Air Act, Clean Water Act or other major environmental regulations.

Ozone Depleting Chemicals (ENV-con-C). The company is among the top manufacturers of ozone depleting chemicals such as HCFCs, methyl chloroform, methylene chloride, or bromines.

Substantial Emissions (ENV-con-D). The company's legal emissions of toxic chemicals (as defined by and reported to the EPA) from individual plants into the air and water are among the highest of the companies followed by KLD.

Agricultural Chemicals (ENV-con-E). The company is a substantial producer of agricultural chemicals, *i.e.,* pesticides or chemical fertilizers.

Climate Change (ENV-con-F). The company derives substantial revenues from the sale of coal or oil and its derivative fuel products, or the company derives substantial revenues indirectly from the combustion of coal or oil and its derivative fuel products. Such companies include electric utilities, transportation companies with fleets of vehicles, auto and truck manufacturers, and other transportation equipment companies. In 1999, KLD added the Climate Change Concern.

Other Concern (ENV-con-X). The company has been involved in an environmental controversy that is not covered by other KLD ratings.

CONTROVERSIAL BUSINESS ISSUES

KLD's Controversial Business Issues ratings differ from the qualitative ratings described in the above issues: the only type of rating for these issues is a concern rating, as they are primarily used as exclusionary lists.

After 2002, KLD listed companies for only one type of involvement in any business issue. Because of this, all types are coded as AREA-con-A. A few legacy concerns remain and are described below, but are all noted as "not rated" in the spreadsheets post-2002.

ALCOHOL *(ALC-con-A)*

Licensing. The company licenses its company or brand name to alcohol products.

Manufacturers. Companies that are involved in the manufacture alcoholic beverages including beer, distilled spirits, or wine.

Manufacturers of Products Necessary for Production of Alcoholic Beverages. Companies that derive 15% or more of total revenues from the supply of raw materials and other products necessary for the production of alcoholic beverages.

Retailers. Companies that derive 15% or more of total revenues from the distribution (wholesale or retail) of alcoholic beverages.

Ownership by an Alcohol Company. The company is more than 50% owned by a company with alcohol involvement.

Ownership of an Alcohol Company. The company owns more than 20% of another company with alcohol involvement. (When a company owns more than 50% of company with alcohol involvement, KLD treats the alcohol company as a consolidated subsidiary.)

Alcohol Other Concern (ALC-con-X). The company derives substantial revenues from the activities closely associated with the production of alcoholic beverages. KLD assigned concerns in this category through 2002.

GAMBLING *(GAM-con-A)*

Licensing. The company licenses its company or brand name to gambling products.

Manufacturers. Companies that produce goods used exclusively for gambling, such as slot machines, roulette wheels, or lottery terminals.

Owners and Operators. Companies that own and/or operate casinos, racetracks, bingo parlors, or other betting establishments, including casinos; horse, dog, or other race tracks that permit wagering; lottery operations; on-line gambling; pari-mutuel wagering facilities; bingo; Jai-alai; and other sporting events that permit wagering.

Supporting Products or Services. Companies that provide services in casinos that are fundamental to gambling operations, such as credit lines, consulting services, or gambling technology and technology support.

Ownership by a Gambling Company. The company is more than 50% owned by a company with gambling involvement.

Ownership of a Gambling Company. The company owns more than 20% of another company with gambling involvement. (When a company owns more than 50% of company with gambling involvement, KLD treats the gambling company as a consolidated subsidiary.)

Gambling Other Concern (GAM-con-X). The company derives substantial revenues from the activities closely associated with the production of goods and services closely related to the gambling industry or lottery industries. KLD assigned concerns in this category through 2002.

TOBACCO *(TOB-con-A)*

Licensing. The company licenses its company name or brand name to tobacco products.

Manufacturers. The company produces tobacco products, including cigarettes, cigars, pipe tobacco, and smokeless tobacco products.

Manufacturers of Products Necessary for Production of Tobacco Products. The company derives 15% or more of total revenues from the production and supply of raw materials and other products necessary for the production of tobacco products.

Retailers. The company derives 15% or more of total revenues from the distribution (wholesale or retail) of tobacco products.

Ownership by a Tobacco Company. The company is more than 50% owned by a company with tobacco involvement.

Ownership of a Tobacco Company. The company owns more than 20% of another company with tobacco involvement. (When a company owns more than 50% of company with tobacco involvement, KLD treats the tobacco company as a consolidated subsidiary.)

Tobacco Other Concern (TOB-con-X). The company derives substantial revenues from the production of tobacco products. KLD assigned concerns in this category through 2002.

FIREARMS *(FIR-con-A)*

Manufacturers. The company is engaged in the production of small arms ammunition or firearms, including, pistols, revolvers, rifles, shotguns, or sub-machine guns. KLD added this coverage in 1999.

Retailers. The company derives 15% or more of total revenues from the distribution (wholesale or retail) of firearms and small arms ammunition. KLD added this coverage in 1999.

Ownership by a Firearms Company. The company is more than 50% owned by a company with firearms involvement. KLD added this coverage in 1999.

Ownership of a Firearms Company. The company owns more than 20% of another company with firearms involvement. (When a company owns more than 50% of company with firearms involvement, KLD treats the firearms company as a consolidated subsidiary.) KLD added this coverage in 1999.

MILITARY *(MIL-con-A)*

***Manufacturers of Weapons or Weapons Systems*.** Companies that derive more than 2% of revenues from the sale of conventional weapons or weapons systems, or earned $50 million or more from the sale of conventional weapons or weapons systems, or earned $10 million or more from the sale of nuclear weapons or weapons systems.

***Manufacturers of Components for Weapons or Weapons Systems*.** Companies that derive more than 2% of revenues from the sale of customized components for conventional weapons or weapons systems, or earned $50 million or more from the sale of customized components for conventional weapons or weapons systems, or earned $10 million or more from the sale of customized components for nuclear weapons or weapons systems.

Ownership by a Military Company. The company is more than 50% owned by a company with military involvement.

Ownership of a Military Company. The company owns more than 20% of another company with military involvement. (When a company owns more than 50% of company with military involvement, KLD treats the military company as a consolidated subsidiary.)

Minor Weapons Contracting Involvement (MIL-con-B). The company has minor involvement in weapons-related contracting. In the most recent fiscal year for which information is available, it derived $10 to $50 million in conventional weapons-related prime contracts (when that figure is less that 2% of revenue), or $1 to $10 million from nuclear weapons-related prime contracts. KLD assigned concerns in this category from 1991 through 2002.

Major Weapons-related Supplier (MIL-con-C). During the last fiscal year, the company received from the Department of Defense more than $50 million for fuel or other supplies related to weapons. KLD assigned concerns in this category from 1991 through 2002.

Military Other Concern (MIL-con-X). The company has substantial involvement in weapons-related contracting. In the most recent fiscal year for which information is available, it derived more than 2% of sales or $50 million from weapons-related contracting, or it received more than $10 million in nuclear weapons-related prime contracts. KLD assigned concerns in this category through 2002.

NUCLEAR POWER *(NUC-con-A)*

The rating does not include companies that store, dispose, or reprocess nuclear fuel waste nor does it include manufacturers of general power plant parts unless the part is specifically and uniquely made for the production of nuclear power.

Construction & Design of Nuclear Power Plants. The company designs, engineers, and constructs nuclear power plants and nuclear reactors for use in nuclear power plants; including companies that design nuclear reactors and engineer and/or construct nuclear power plants.

Nuclear Power Fuel and Key Parts. The company supplies nuclear fuel material and key parts used in nuclear plants and reactors. Fuel includes mining of uranium and conversion, enrichment, and fabrication of uranium. Key parts include manufacture or sale of specialized parts for use in nuclear power plants including but not exclusive to steam generators, control rod drive mechanisms, reactor vessels, cooling systems, containment structures, fuel assemblies, and digital instrumentation & controls.

Nuclear Power Service Provider. The company is involved in the transport of nuclear power materials and nuclear plant maintenance.

Ownership of Nuclear Power Plants. The company has an ownership interest or operates nuclear power plant(s). Does not include publicly traded companies that are an owner or operator of a nuclear plant that has shut down and is being decommissioned.

Ownership by a Nuclear Power Company. The company is more than 50% owned by a company with nuclear power involvement.

Ownership of a Nuclear Power Company. The company owns more than 20% of another company with nuclear power involvement. If company ownership of company with nuclear power involvement is greater than 50%, KLD treats subsidiary as a consolidated subsidiary.

Design (NUC-con-C). The company derives identifiable revenues from the design of nuclear power plants. This category does not include companies providing construction or maintenance services for nuclear power plants. KLD assigned concerns in this category through 2002; the rating was re-instated as *Construction & Design of Nuclear Power Plants* under the code NUC-con-A in 2005.

Fuel Cycle/Key Parts (NUC-con-D). The company mines, processes, or enriches uranium, or is otherwise involved in the nuclear fuel cycle. Or, the company derives substantial revenues from the sale of key parts or equipment for generating power through using nuclear fuels. KLD assigned concerns in this category through 2002. KLD assigned concerns in this category through 2002; the rating was re-instated as *Nuclear Power Fuel and Key Parts* under the code NUCcon- A in 2005.

Nuclear Power Other Concern (NUC-con-X). The company is involved in the production of Nuclear Power. KLD assigned concerns in this category through 2002.

TESIS DOCTORAL - RESUMEN EN CASTELLANO

TÍTULO:

La relación entre investigación y desarrollo y responsabilidad social corporativa

Resumen

En esta investigación se analiza el impacto que la Investigación y Desarrollo (I+D) tiene sobre la Responsabilidad Social Empresarial (RSE) y como estas variables pueden afectar el desempeño organizacional de una empresa. Para lograr este objetivo se han aplicado métodos robustos de estimación en una muestra significativa de empresas estadounidenses. Para medir la RSC utilizamos la base de datos Kinder Lydenberg Domini (KLD) que, de acuerdo con Márquez y Fombrun (2005), en diversos aspectos es uno de los mejores instrumentos disponibles actualmente para medir la RSC. Pero, a pesar de ser uno de los mejores instrumentos existentes, KLD tiene ciertas limitaciones relacionadas con la naturaleza binaria de sus variables.

Los análisis empíricos están organizados en tres capítulos. En el primero, los resultados resaltan el efecto positivo y significativo que tiene la I+D en la RSE y como este efecto tiene más intensidad en las industrias manufactureras que en las no manufactureras. En el siguiente capítulo se analiza como un tipo de I+D, innovación con altos beneficios sociales impacta en el desempeño financiero de las empresas. Se demostró que este tipo de innovación afecta negativamente a los resultados, sin embargo, a largo plazo este tipo de innovación podría impactar positivamente en la reputación de la empresa. Finalmente, en el tercer estudio empírico se analiza el efecto que la I+D tiene sobre la reputación empresarial, y como ésta relación es moderada por innovaciones con altos beneficios sociales. Se encontró que la I+D impacta negativamente en la reputación empresarial, pero cuando la I+D produce algún tipo de beneficio social, el efecto se vuelve positivo y significativo.

Todos los resultados encontrados en cada capítulo de esta tesis aportan conocimientos importantes a la literatura de RSE y crean otras oportunidades para realizar otras investigaciones. Además, hay que destacar la cualidad dinámica de la RSE y como esta cualidad brinda enormes posibilidades para futuras investigaciones. Esperamos que esta tesis haya sido un importante paso hacia nuevas direcciones en la investigación de la RSE, y que logre mejorar nuestra comprensión de la relación entre las empresas y la sociedad.

Capitulo 1 – Introducción

La responsabilidad social de las empresas (RSE) ha tomado mucha importancia empresarial y académica durante las últimas décadas, donde se han producido muchos trabajos conceptuales y empíricos (ver Carroll and Shabana, 2010; Lee, 2008; Margolis and Wash, 2003; Orlitzky et al., 2003; Windson, 2000; Wood 1991; 2010). La literatura ha prestado una atención especial a las relaciones entre la RSE y el desempeño financiero, aunque con resultados mixtos y sin una comprensión clara (McWilliams et al., 2006). Los estudios empíricos existentes sobre la relación entre la RSE y el desempeño financiero de las empresas sufren limitaciones importantes. Una de ellas es la omisión de variables que han demostrado ser determinantes en esta relación. Una de esas variables que no se ha tomado en cuenta, es la intensidad de la inversión en investigación y desarrollo (I + D) de las empresas (McWilliams y Siegel, 2000).

Objetivos y Organización de la Tesis

Dentro de este contexto, esta tesis trata de responder a algunas preguntas para las cuales aún no se encuentra un consenso en la literatura de RSE. La investigación se centra principalmente en la comprensión de la relación entre la RSE y la I + D y como estas pueden afectar el desempeño organizacional de una empresa. Ha habido varios estudios que han sugerido que la intensidad de I + D debe ser incluida en los modelos que estudian la relación entre RSE y desempeño financiero (ejemplos: McWilliams y Siegel, 2000 y Hull y Rothenberg, 2008). Sin embargo, hasta donde sabemos no ha habido ninguna investigación que se haya centrado principalmente en comprender el impacto que la variable de I+D tiene sobre la RSE. En cada uno de los capítulos de esta tesis se ha abordado un factor que influye en esta relación.

En el capítulo 2, se ha abordado la RSE y la I + D como recursos intangibles valiosos y difíciles de imitar, que pueden ayudar a una empresa a obtener una ventaja competitiva. Además, tanto la intensidad de I + D como la RSE pueden ser percibidos como inversiones para la diferenciación de producto. Dependiendo de la industria en la que se encuentra la empresa, ésta puede sufrir presiones de diferente intensidad de sus diversos *stakeholders* internos y externos para ampliar sus actividades relacionadas con RSE y I+D. Por lo tanto esta investigación tuvo como objetivo identificar el efecto que la intensidad de I+D tiene sobre la RSE y se extiende el estudio analizando este efecto en dos escenarios: las industrias manufactureras y las industrias no manufactureras.

Tanto las actividades de I + D como las de RSE pueden crear activos que permitan a las empresas alcanzar una ventaja competitiva. Por otra parte, el empleo de esas actividades puede mejorar el bienestar de la comunidad y satisfacer las expectativas de los *stakeholders*, que

puede variar de acuerdo a su entorno. Como la RSE y la I + D varían a lo largo de las industrias, extendemos nuestra investigación, analizando el impacto que la intensidad de I + D sobre la RSE a través de las industrias manufactureras y no manufactureras. Los resultados muestran que la intensidad de I + D afecta positivamente a la RSE y que esta relación es significativa en las industrias manufactureras, sin embargo, para la industrias no manufactureras se obtuvo un resultado no significativo.

Para este capítulo se utilizó la teoría de los recursos, sin embargo, para los capítulos 3 y 4, se utilizo un marco teórico combinando de la teoría de los recursos y capacidades (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984), que es ideal para estudiar los recursos intangibles como la I + D y la RSE, como se ha mencionado anteriormente, y la teoría institucional (DiMaggio y Powell, 1991; Scott, 1995), que examina el papel de las influencias sociales y las presiones de conformidad social en la determinación de las decisiones y acciones de las empresas.

El capítulo 3 tiene el objetivo de estudiar el efecto que la innovación con alto beneficio social tiene en el desempeño financiero. Innovación con alto beneficio social implica actividades de I + D que proporcionan diferentes tipos de beneficios a la sociedad. Varios estudios han demostrado que existe una clara diferencia en el desempeño de las empresas innovadoras (e.g. Lev, Redhakrishnan and Ciftci, 2006) y que estas se pueden clasificar en líderes en innovación y seguidores, por esta razón se decide extender la investigación, estudiando como esta característica de las empresas impacta en su desempeño financiero.

Esta investigación pretende identificar cual estrategia de innovación afecta con mayor intensidad en el desempeño financiero. Para apoyar este análisis, como ya fue mencionado anteriormente se utilizó la teoría de los recursos y la teoría institucional. La investigación utilizó la técnica de datos de panel, con una muestra que contenía 2.025 observaciones de 418

empresas. Los resultados de esta investigación demuestran que existe un efecto negativo y significativo entre la innovación con alto beneficio social y el desempeño financiero, destacando la importancia de la participación de instituciones gubernamentales y no gubernamentales para crear un incentivo para que las empresas que invierten en este tipo de actividades innovadoras puedan continuar haciéndolas y beneficien a la sociedad. A pesar de que se obtuvo un efecto negativo entre la innovación con alto beneficio social y el desempeño financiero, creemos que este tipo de innovaciones crea legitimidad, porque las empresas están cumpliendo con las expectativas de la sociedad.

De acuerdo con los resultados y conclusiones del capítulo 3, el capítulo 4 aborda el efecto de la intensidad de I + D en la reputación corporativa y cómo la innovación que genera beneficio social puede moderar este efecto. El objetivo principal de la investigación fue determinar si la intensidad en I + D por sí sola podría crear una reputación corporativa positiva, además de identificar si la innovación con beneficio social modera positivamente esta relación. Puesto que, la innovación con beneficios sociales produce externalidades positivas que al ser percibidas por los *stakeholders* afectan de forma positiva la legitimidad de la empresa.

Como marco teórico se utilizó la teoría de recursos y la teoría institucional, al igual que en el capítulo 3. Esta investigación ofrece perspectivas sobre cómo las empresas pueden mejorar su reputación a través de actividades de I + D relacionadas con las innovaciones sociales. Se demostró que la I + D por sí sola no afecta a la reputación corporativa de manera positiva. Sin embargo, cuando las actividades de una empresa de I + D generan beneficios sociales, la reputación de las empresas será afectada positivamente.

Capitulo 2 – El efecto que I+D tiene en responsabilidad social de las empresas

Introducción

La importancia de la RSE en la gestión de empresas ha animado a los académicos a estudiar sus efectos y cómo las empresas pueden obtener beneficios al realizar actividades sociales. Ha habido un número creciente de publicaciones que estudian la RSE, con resultados mixtos y sin una comprensión clara debido a la incertidumbre y la intangibilidad del término (Frankental, 2001). Además, existen numerosas definiciones de la RSE, lo cual dificulta su desarrollo teórico y medición (McWilliams, Siegel y Wright, 2006). La dificultad de medir la RSE también es ocasionada por los distintos antecedentes y características que cada industria posee (Graves y Waddock, 1994; Waddock y Graves, 1997). Por lo tanto, la dificultad de realizar investigaciones en el campo de la RSE se ve aumentada tanto por su complejidad y por el hecho de que es un área de investigación muy reciente en la literatura (Harrison y Freeman, 1999).

Este capítulo se basa en los resultados de estudios recientes que han investigado el efecto que la RSE tiene en el desempeño financiero de las empresas. Uno de los hallazgos más importantes que ayuda a los investigadores a medir con precisión esta relación fue reportado por McWilliams y Siegel (2000), quienes demostraron que la RSE se correlaciona positivamente con la intensidad de I + D. Otra investigación que corrobora este hallazgo es el estudio realizado por Hull y Rothenberg (2008). Por esta razón, el objetivo de este capítulo es

estudiar el impacto que la I + D tiene sobre la RSE, tratando de aportar información a todos los investigadores que deseen estudiar la relación entre la RSE y los resultados financieros, incluyendo la I + D como una variable necesaria en sus modelos.

Estudios previos, como los de Berrone, Surroca y Tribo (2007), Bouquet y Deutsch (2008), Hull y Rothenberg (2008), McWilliams y Siegel (2000, 2001), y Prior, Surroca y Tribo (2008), han descubierto que estas variables, RSE y I+D, se correlacionan al estudiar el impacto de la RSE en el desempeño financiero. Sin embargo, ninguna de estas investigaciones ha estudiado el impacto directo que la I + D tiene sobre la RSE, por lo que se consideró necesario estudiar este efecto con el fin de llenar este vacío en la literatura.

El marco teórico que se ha utilizado como base para este estudio es la teoría de recursos y capacidades, que puede contribuir a nuestro análisis de la intensidad de I + D y la RSE, porque reconoce explícitamente la importancia de los recursos intangibles, como son los conocimientos, la cultura corporativa y la reputación (Russo y Fouts, 1997).

Ésta investigación ha adoptado la técnica de datos de panel, la cual permite controlar el riesgo de heterogeneidad no observada (Bouquet y Deutsch, 2008). Nuestra hipótesis principal afirma que la intensidad de I + D afecta positivamente a la RSE. Luego se va un paso más allá con la segunda hipótesis, la cual examina este efecto entre las empresas en las industrias manufactureras y no manufactureras. Esperamos que este efecto sea más fuerte en las empresas de las industrias manufactureras, en línea con Hadlock, Hecker y Gannon (1991), que postulan que las industrias manufactureras cuentan con una elevada concentración de I+D. Además, de acuerdo con Hull y Rothenberg, (2008); McWilliams y Siegel (2000); Rothenberg y Zyglidopolous, (2007) las empresas que tienen alta inversión en I + D probablemente tendrán una responsabilidad social alta.

Este artículo contribuye a la literatura de diferentes maneras: en primer lugar, se estudia un efecto entre dos variables que hasta ahora no se ha estudiado de esta manera, en segundo lugar, se estudia el impacto de una variable sobre otra, entre las industrias manufactureras y no manufactureras y, por último, se utiliza una metodología de datos de panel que otorga solidez a nuestra investigación.

Discusión y Conclusiones

Los resultados de esta investigación aceptan la primera hipótesis, que establece que la intensidad de I + D afecta a la RSE de una manera positiva. I + D se considera una forma de inversión que se traduce en la mejora de conocimientos, lo que lleva a la innovación de productos y procesos. Estas mejoras de producto y proceso pueden optimizar procesos y productos relacionados con la RSE. Por ejemplo, las actividades de I + D podrían hacer que los procesos fueran más eficaces, reduciendo la cantidad de energía que consume la empresa, reduciendo costes y contaminación. Estas actividades también deben tenerse en cuenta como acciones de RSE de la empresa. Nuestros resultados también aceptan la segunda hipótesis que muestra que la intensidad de I + D afecta a la RSE de forma positiva y significativamente en las industrias manufactureras, mientras que en las industrias no manufactureras la intensidad de I + D no tiene ningún efecto significativo sobre la RSE. Este resultado podría explicarse por el hecho de que las industrias de fabricación están bajo más presión por *stakeholders* y políticas gubernamentales. Además de estas presiones, algunas empresas eligen siempre superar las expectativas de los *stakeholders*, mediante la participación acciones de RSE minimizando

residuos, consumo de energía, e iniciando programas que beneficien a sus empleados (Chapple, Morrison y Harris, 2004).

El valor académico de esta investigación es haber llenado un vacío en la literatura, ya que desconocemos que otro estudio se haya enfocado en entender el efecto que la intensidad de I + D tiene sobre RSE como se ha propuesto en este estudio. Además el modelo se estimó usando las técnicas de datos de panel, que son capaces de controlar la heterogeneidad inherente. Los resultados de este estudio concuerdan con los resultados de investigaciones previas que indican la importancia de tomar en cuenta la intensidad de I + D al estudiar la relación entre la RSE y los resultados financieros de una empresa.

El valor empresarial de este estudio, refleja que las empresas deben tomar en cuenta sus actividades de I + D al desarrollar su estrategia de RSE, puesto que las innovaciones de procesos y productos pueden estar relacionadas con actividades de RSE. Esto permitirá a la empresa gestionar los costes con mayor eficacia y determinar si otras actividades de RSE son necesarias para cumplir con las expectativas de sus *stakeholders*. Esto es importante para los gerentes, ya que a través de estrategias de I+D y RSE se puede alcanzar una diferenciación, permitiendo a la empresa obtener una ventaja competitiva. Además, las empresas deben hacer un esfuerzo para demostrar que son parte de una sociedad, con una responsabilidad que va más allá de la estrecha perspectiva de la ganancia (Quazi y O'Brien, 2000) y que realizar actividades sociales es una oportunidad para la construcción de una relación sostenible con sus *stakeholders* (Polonsky et al, 1997; Quazi y O'Brien, 2000).

Para futuras investigaciones podría ser interesante estudiar individualmente por industria manufacturera, el efecto que la intensidad de I + D tiene en la RSE. Ya que este efecto podría ser más fuerte o más débil dependiendo de las características de una determinada industria. Por

otra parte, debido a la complejidad de la RSE, se podría realizar un estudio del efecto que la intensidad de I + D tiene sobre las diferentes dimensiones de la RSE, para proporcionar mayor conocimiento y comprensión sobre este efecto.

Capitulo 3 – Innovación con altos beneficios sociales y el desempeño financiero corporativo

Introducción

La literatura ha identificado varios incentivos por los cuales las empresas participan en actividades de Investigación y Desarrollo (I + D) (Coombs y Bierly de 2006, Holmes y Smart, 2009; Wagner, 2010). Algunas de ellas son las presiones gubernamentales y no gubernamentales, dirigidas hacia las empresas a reducir la contaminación y los costes. Es natural preguntarse si en realidad las actividades de innovación son una respuesta a estas presiones o a otras fuerzas del mercado, como puede ser la competencia internacional, la industria en la que se encuentran estas empresas o las características de la economía.

Hasta la fecha, la literatura aporta abundantes razones por las cuales las empresas invierten en I + D (Brunnermeier y Cohen, 2003). Un número de estudios empíricos han intentado identificar los factores determinantes que hacen que la empresa participe en actividades de I + D a nivel de la empresa y de industria (por ejemplo, Brunnermeier y Cohen, 2003; Jaffe y Palmer, 1997; McWilliams y Siegel, 2000; Rennings et al, 2006). Por ejemplo,

McWilliams y Siegel (2000) y Hull y Rothenberg (2008) demuestran, que la RSE se correlaciona positivamente con la intensidad de I + D. Otra investigación más reciente es la de Padgett y Galán (2010), que estudia estas dos variables y demuestra que la I+D afecta positivamente a la RSE. Otra investigación en esta línea es la de Wagner (2010), que analiza el vínculo entre la innovación, con altos beneficios sociales y el desempeño social de las empresas, muestra que hay una relación significativa entre este tipo de innovación con el desempeño de la RSE. Esta última investigación despierta nuestro interés en este tipo de innovación y como este puede influir en el desempeño organizacional de la empresa. Por esta razón se decide estudiar el impacto de la innovación con alto beneficio social en el desempeño financiero corporativo.

En este capítulo se analiza el efecto que la innovación con alto beneficio social tiene sobre los resultados financieros. Como existen distintos tipos de estrategias de innovación, también se decide estudiar el efecto que tiene ser un líder en innovación sobre los resultados financieros, con la intención de observar el comportamiento de las dos estrategias en el desempeño financiero de las empresas. En este análisis se utiliza la teoría de los recursos y la teoría institucional. La teoría de recursos (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984) examina recursos y las capacidades empresariales que permiten obtener una ventaja competitiva. A pesar de las valiosas aportaciones de la teoría de recursos, existen algunos aspectos empresariales que ésta teoría no examina, tales como el contexto social y como las decisiones de la selección de recursos encajan en el contexto empresarial (Oliver, 1997; Ginsberg, 1994). Según Oliver (1997), a fin de complementar la teoría de recursos y analizar el contexto social de los recursos, es necesario incluir la teoría institucional (DiMaggio y Powell, 1991; Scott, 1995), que examina el papel de las influencias y presiones sociales para la toma de decisiones y acciones organizacionales. Mediante la implementación de ambas teorías como

marco teórico para esta investigación, tenemos la intención de mostrar los distintos motivos por las cuales las empresas deciden participar en actividades de I + D.

Esta investigación utilizó la técnica de datos de panel, lo que permitió controlar el riesgo de heterogeneidad no observada (Bouquet y Deutsch, 2008). La hipótesis principal trata de identificar si la innovación con alto beneficio social tiene un impacto positivo sobre los resultados financieros de las empresas. Algunos investigadores como Lev, Redhakrishnan y Çiftçi (2006) han afirmado que existe una clara diferencia entre el desempeño de los seguidores y líderes en innovación. Los lideres en innovación son reconocidos por tener exceso de rentabilidad, debido a un mayor crecimiento de ventas y rentabilidad de sus activos.

Discusión y Conclusiones

Este artículo contribuye a la literatura, ya que analiza si las empresas tienen algún incentivo financiero para participar en actividades innovadoras que producen algún tipo de beneficio social. Ya que en caso de que no exista un incentivo financiero a corto plazo, las instituciones gubernamentales y no gubernamentales deben tomarlo como una señal para incentivar financieramente a las empresas que están haciendo este tipo de actividades innovadoras. Porque es importante que las empresas que realizan actividades innovadoras que benefician a la sociedad lo sigan haciendo.

Además de estudiar el efecto que tiene la participación en actividades innovadoras que producen beneficio social en el desempeño financiero, se analiza el impacto que tiene la estrategia de ser un líder en innovación sobre los resultados financieros de una empresa,

posibilitando la comparación del impacto de éstas dos estrategias de inversión en I+D en el desempeño de la organización.

Los resultados de esta investigación demuestran que la innovación con alto beneficio social tiene un efecto negativo sobre los resultados financieros. Este resultado hace que se rechace la primera hipótesis propuesta, que indica que existe un efecto positivo entre la innovación con alto beneficio social y el desempeño financiero de la empresa. A pesar de haber obtenido este resultado, asumimos basándonos en Doh, et al. (2010) que la innovación con beneficio social genera legitimidad a la empresa que resulta en una buena reputación.

Si no existe una motivación económica para las empresas que realizan actividades innovadoras con beneficios sociales a corto plazo, las instituciones gubernamentales y no gubernamentales deberían ofrecer incentivos a estas empresas para que continúen realizando este tipo innovaciones que proporcionan beneficios a la sociedad. Además, se asume que estas actividades podrían a largo plazo brindar beneficios financieros a las empresas, mediante la creación de una buena reputación. Según Godfrey (2005), la reputación en sí misma no tiene valor económico aunque puede llegar a generarlo a largo plazo.

Como futura investigación se propone estudiar como los distintos tipos de innovaciones con beneficio social pueden afectar los resultados financieros a corto plazo. Hart y Ahuja (1996) han encontrado en su estudio sobre la relación entre la reducción de emisiones y desempeño de la empresa, que vale la pena ser “verde” y realizar innovaciones que reduzcan las emisiones. Además, King y Lennox (2001), han encontrado que la reducción de la contaminación tiene un efecto positivo en la valoración financiera, pero este resultado depende de las características de la empresa y su posición estratégica en el mercado. Por esta razón los mismos autores proponen que en lugar de hacer la pregunta "¿Vale la pena ser verde? La

pregunta es ¿Cuándo es que vale la pena ser verde?". Por otro lado, otros investigadores han argumentado que es importante que las empresas miren más allá de los beneficios financieros a corto plazo y tengan una preocupación social al momento de tomar decisiones estratégicas, ya que las acciones sociales podrían asegurar sus intereses comerciales a largo plazo, mediante la creación de una relación con su comunidad (Quazi y O'Brien, 2000)

Asimismo, los resultados demostraron que el ser un líder en innovación tiene un impacto positivo sobre el rendimiento financiero, de acuerdo con Lev, et.al. (2006). Como Barney (1991), Grant (1991) y Roberts y Dowling (2002) han afirmado, los recursos que los líderes tienen, los hace diferenciarse de los seguidores, y es difícil que los seguidores logren una ventaja competitiva porque los recursos que los líderes poseen, por lo general son escasos y difíciles de imitar, lo que les permite mantener un desempeño financiero superior.

El valor académico de esta investigación es que se ha proporcionado una mayor comprensión acerca de este tema, ya que se desconoce la existencia de algún otro estudio que se centre en el efecto que la innovación con alto beneficio social tiene sobre los resultados financieros. Además el estudio observa y ayuda a determinar si las empresas tienen un incentivo financiero para participar en actividades innovadoras que producen algún tipo de beneficio social. Asimismo, nuestro modelo se estimó con datos de panel, una técnica capaz de controlar la heterogeneidad inherente. Del mismo modo, este estudio abre otras preguntas de investigación, tales como: que actividades de innovación con alto beneficio social pueden ser rentables para la empresa a corto plazo, que circunstancias y características deben tener las empresas para obtener un beneficio al realizar este tipo de actividades.

En cuanto al valor empresarial, este estudio proporciona información a las empresas, sobre qué deben esperar cuando se realizan innovaciones con alto beneficio social. Como

hemos mencionado antes, a pesar de que la relación entre estas dos variables es negativa, probablemente hay otros beneficios que pueden obtenerse a partir de la innovación con alto beneficio social. Algunos de los beneficios obtenidos a largo plazo de la innovación con el beneficio social, puede ser la creación de legitimidad al cumplir con la demanda de los *stakeholders* que piden a la empresa acciones sociales. Por otra parte, existe una relación positiva entre ser un líder en innovación y el desempeño económico, que puede alentar a las empresas a convertirse en líderes de la innovación con el fin de obtener una ventaja competitiva. Por último, nuestros resultados demostraron que en un corto período de tiempo, ser un líder en la innovación tiene un mayor impacto en el desempeño financiero que participar en actividades de innovación con alto beneficio social.

Capitulo 4 – El impacto de I+D en la reputación corporativa: efecto interactivo de la innovación con altos beneficios sociales

Introducción

La mayoría de las empresas exitosas buscan posicionarse y quieren ser identificadas como altamente innovadoras y socialmente responsables. La literatura parece estar de acuerdo cada vez más con la idea de que la RSE y la I+D son complementarias (Branco y Rodrigues, 2006; McWilliams y Siegel, 2000; Padgett y Galán, 2010) y que pueden tanto influir positivamente en el desempeño financiero como en la reputación global de la empresa (Chun, 2006). A pesar de

la importancia dada al tema en los últimos años, poco se sabe acerca de cómo la relación entre responsabilidad social empresarial y la I + D impactan en la reputación corporativa.

En este capítulo, se analiza el efecto que la intensidad de I + D tiene sobre la reputación corporativa (RC), y cómo este efecto puede ser positivamente moderado por acciones de innovación con altos beneficios sociales. Para apoyar este análisis se utilizó la teoría de recursos y la teoría institucional. Estas dos teorías prestan un importante apoyo al estudio de los recursos intangibles y además la teoría institucional añade importancia las presiones de los *stakeholders* y como estas pueden llegar a influir en las decisiones de las empresas a la hora de administrar sus recursos.

Esta investigación se basa en la idea de que las actividades de I + D que producen beneficios sociales tendrán un mayor efecto en la RC que la I + D por sí misma. Las actividades de I + D no tienen la obligación de producir beneficios sociales y, por tanto, al no producir este tipo de beneficios que son fácilmente percibidas por los *stakeholders*, se traduce en un menor impacto en la reputación de la empresa. Por otro lado, cuando la innovación produce algún beneficio social, los *stakeholders* perciben y reconocen las intenciones de la empresa y por lo tanto tendrá un mayor efecto positivo sobre la reputación de la empresa.

La literatura existente, rara vez enlaza las actividades sociales de la empresa con la innovación como elementos clave para la reputación sostenible. Sin embargo, existe una investigación realizada por Chun (2006), que ha estudiado el efecto que la I + D tiene en la reputación. La investigación encontró que para que las empresas innovadoras logren tener una buena reputación, tienen que ser socialmente responsables. A pesar de que esta investigación estudió el mismo efecto que estamos analizando en este trabajo, ofrecemos un enfoque diferente ya que incluye otras variables como la innovación con alto beneficio social.

La investigación ofrece varias aportaciones a la literatura: en primer lugar, se está estudiando la relación entre tres variables que hasta ahora no han sido estudiadas de esta manera, en segundo lugar, la investigación da ideas a los directivos que quieren mejorar su reputación a través de la realización de actividades de I + D, y no han obtenido los resultados deseados, ya que la I + D por sí sola puede no llegar a influir positivamente en la reputación de la empresa. Pero cuando la empresa realiza actividades de I + D que producen algún tipo de beneficio social, entonces la reputación de las empresas es afectada positivamente. En tercer lugar, esta investigación ha adoptado una metodología de datos de panel, una técnica que permite controlar el riesgo de heterogeneidad no observada (Bouquet y Deutsch, 2008).

Este capítulo está organizado de la siguiente manera: primero se hace una revisión de la teoría de recursos y la teoría institucional. Luego se revisa la evidencia empírica, y se plantean las hipótesis. La tercera sección describe los datos y el método de estimación utilizado en el análisis, seguido por los resultados y, por último, se presentan las conclusiones de la investigación.

Discusión y Conclusiones

La RBV y la teoría institucional nos permitieron analizar el efecto que la intensidad de I+D tiene en la reputación corporativa, y cómo este efecto es positivamente moderado por innovaciones con altos beneficios sociales. Ambas teorías han permitido demostrar la importancia de la I+D, los beneficios sociales obtenidos a partir de las actividades de I+D y cómo estas acciones cuando son percibidas por los *stakeholders*, pueden ayudar a crear una buena reputación para las empresas.

Los resultados de esta investigación demuestran que la intensidad de I + D tiene un efecto negativo en la reputación corporativa, lo cual apoya el rechazo de la primera hipótesis, que indica que hay un efecto positivo entre estas dos variables. Este resultado nos da a entender de que no todos los tipos de innovación pueden mejorar o tener una influencia positiva en la reputación corporativa. Futuras investigaciones deberían determinar qué tipos de innovaciones pueden tener un impacto positivo en la reputación. Lo que está claro en nuestros resultados, es que si la inversión en I+D produce algún tipo de beneficio social, el impacto que tiene en la reputación será positivo. La innovación con un alto beneficio social modera de forma positiva el impacto que la intensidad de I + D tiene en la reputación corporativa, apoyando así la segunda hipótesis. La intensidad en I+D cuando moderada por la innovación con altos beneficios sociales tiene un efecto positivo en la reputación. Esto puede suceder porque las actividades de I+D no producen ningún tipo de beneficio social no son percibidas por sus *stakeholders*, en cambio cuando la innovación brinda beneficios a la sociedad, los *stakeholders* perciben las intenciones de la empresa con mayor facilidad y por lo tanto tiene un efecto positivo sobre la reputación de la empresa.

Hemos percibido a lo largo de este estudio que la literatura existente, rara vez vincula las actividades sociales de las empresas con la innovación, como elementos clave para una buena reputación. A través de esta investigación hemos encontrado que la interacción entre las estas variables debe ser considerada y investigada, ya que esta interacción puede ayudar a empresas a obtener una buena reputación. Recientemente, varios estudios han visto que la I + D está relacionada con la RSE y que es importante incluir esta variable en estudios que se enfocan en el impacto que la RSE tiene en los resultados financieros de las empresas. Ésta investigación es novedosa en el sentido de que se aplica esta recomendación, pero en vez de estudiar el desempeño financiero de la empresa, estamos viendo el efecto que la RSE tiene en la

reputación corporativa, un efecto del cual poco se menciona en la literatura existente. De esta manera, esta investigación trata de llenar un vacío existente en la literatura, proporcionando evidencia de que las innovaciones que producen beneficios sociales moderan la relación que la I + D tiene con la reputación.

A mismo tiempo la investigación brinda información a los empresarios que están tratando mejorar la reputación de su empresa a través de actividades de I + D. La investigación les da información y les hace ver que la I + D por sí sola no tiene una influencia positiva en la reputación corporativa, pero cuando las actividades de I + D de la empresa producen algún tipo de innovación con un beneficio social, entonces su reputación será afectadas positivamente. Las empresas innovadoras deben centrar sus esfuerzos en la identificación de oportunidades en sus procesos de I + D para iniciar las actividades relacionadas con la RSE que podría ayudar a construir una buena reputación, que a la larga puede darles una ventaja competitiva y resultados rentables. Además, para tener una sinergia entre las estrategias de RSE y la innovación, las empresas deben hacer un esfuerzo para asegurar que "son parte de una sociedad, con una responsabilidad más amplia que va más allá de la estrecha perspectiva de la ganancia" (Quazi y O'Brien, 33:2000), y que es una oportunidad para construir una relación sostenible con la comunidad (Polonsky et al, 1997; Quazi y O'Brien, 2000).

Para futuras investigaciones podría ser interesante determinar qué tipos específicos de I + D pueden llegar a producir un efecto positivo en la reputación y que otras variables podrían moderar esta relación. Además, sería interesante estudiar el entorno y contexto de las empresas, por ejemplo, el tipo de industria en la que se encuentran.