Corporate Social Responsibility and Firms' Performance: a Stratigraphical Analysis

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Abstract

Over the last two decades in OECD countries an increasing number of firms are obtaining certification as Socially Responsible (CSR is the acronym for Corporate Social Responsibility). Several studies (including Preston and O'Bannon, 1997; Waddock and Graves, 1997; McWilliams and Sieger, 2001; Ullman, 1985) have sought to test whether there is a relation between Social Responsibility certification and the firms' performance.

Our work builds a CSR index that intersects two of the three main international indices (Domini 400 Social Index, Dow Jones Sustainability World Index, FTSE4Good Index), in order to overcome some problems related to the multiplicity of CSR definitions and certifications. By using this database, our work carries out a stratigraphical analysis in order to verify whether some variables are statistically different in the CSR group with respect to the benchmark case (non-CSR).

The main results show that there are several interesting differences in some economic indicators between CSR and non-CSR firms and between USA and EU, and among different industrial sectors.

Key Words: Corporate Social Responsibility, Growth.

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Introduction

Over the past two decades in OECD countries there has been an increase in Corporate Social Responsibility (CSR, hereafter[4]) firms[5] (see figures 1 and 2).

Given the importance of the phenomenon, the economic literature has begun to deal with it, developing extensive lines of research on issues concerning the theme of sustainability and CSR. The economic debate has mainly focused on three aspects: first, the very definition of CSR (see Garriga and Mele, 2004; Dahlsrud, 2008, van Beurden and Gossling, 2008, etc.) and its measurement (Türker, 2008), secondly the main reasons that lead companies to adopt sustainable behaviours and then to obtain certification (Sotorrio and Sanchez, 2008; Detomasi, 2007; Udayasankar, 2007) and thirdly the effect of CSR on the economic and financial system (Beurden and Gossling, 2008; Sotorrio and Sanchez, 2008).

Given that the definitions of CSR currently used in economic literature are not homogeneous (Dahlsrud, 2008), it is now difficult to uniquely and correctly define this concept. Moreover, due to the fact that CSR is "not a variable and therefore it is not measurable", the economic literature has introduced the concept of Corporate Social Performance (CSP, hereafter), which is a way of making CSR applicable and putting it into practice (Maron 2006). Even if CSP is difficult to measure, it can be transformed into measurable variables. Van Beurden and Gössling (2008), also in line with Sotorrio and Sanchez (2008), describe CSP as "a concept of three categories": CSP1: social disclosure about social concern (Wu, 2006; Orlitzky et al., 2003); CSP2: corporate action, such as philantropy, social programs and pollution control; CSP3: corporate

[4] CSP can be defined as 'a business organization's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm's societal relationships' (Wood 1991a: 693).

[5] This term defines those firms that adopt ethical behaviour, both in the environmental field (respecting biodiversity, adopting environmentally friendly fuels, using alternative energy sources, reclaiming polluted areas, etc.), and in purely business (improving workers' conditions, respecting all types of diversity, allowing for good governance and transparency in the management of business, etc.). See Dahlsrud (2008).

reputation ratings or social indices that may be provided by social rating institutions, such as KLD, EIRIS; Fortune, Moskowitz, or ad hoc indices drawn up by the researchers themselves (Beliveau et al., 1994; Brammer et al., 2006; Hillman et al., 2001; Johnson and Greening, 1999; Mahoney and Thorne, 2005; Moore, 2001). In this regard, this paper refers to the category CSP3.

However, in the context of CSP3, the perception of increasing numbers of CSR companies is partially distorted for two reasons, which reduce the value of the certification itself: firstly, there is no unambiguous definition of "socially responsible". On the other hand, since the birth of CSR, there has been a proliferation of certification agencies, evaluating firms on the basis of widely varying non-standard criteria.

As regards the factors that drive companies to CSR, the research into corporate social responsibility has been related to the analysis of value creation (Alexander and Buchholz, 1978; Belkaoui, 1976; Clarkson, 1995; Harrison and Freeman, 1999; Preston and O'Bannon, 1997; Kohers and Simpson, 2002; Vance, 1975; Waddock and Graves, 1997).

Moreover, Sotorrio and Sanchez (2008) identify different "starting points": a) disclosure of information about social natures (Belkaoui and Karpik, 1989; Pavelin and Brammer, 2004, 2006, Fernandez Sanchez and Sotorrio, 2004; Roberts, 1992; Stanwick and Stanwick, 2006); b) the reasons behind spending on social performance, such as donations, philanthropy, etc. (Adams and Hardwick, 1998; Amato and Amato, 2007; Brammer and Millington, 2004, 2006; Navarro, 1988); c) a variety of principles, processes, policies, programmes and observable results relating to the company's relationship with society. In this last case, some social indices, credit ratings provided by social institutions, such as EIRIS or KLD, or ad hoc indices drawn up by the researchers themselves (Beliveau et al., 1994, Brammer et al., 2006, Hillman et al., 2001; Johnson and Greening, 1999; Mahoney and Thorne, 2005; Moore, 2001).

Regarding the impact of CSR on the economic system, several works (Beurden and Gossling (2008); Sotorrio and Sanchez (2008), Orlitzky et al., 2003; Garriga and Mele, 2004; Kitzmueller, 2008) have analyzed this relationship, focusing primarily on the link between CSR and the

financial performance of the certified firms. However, the effect of CSR is reflected on the whole economic system, in line with the stakeholder theory[6]. Therefore, there are different effects of CSR to be classified according to different variables. About this, research shows that there is a difference in the prediction of financial performance between measures of market-based accounting and CFP-based measures of CFP (Orlitzky et al., 2003; Wu, 2006).

Beurden and Gössling (2008) use CFP as the instrument to measure economic performance. It consists of two categories. CFP 1 incorporates market-based measures that include stock performance, market return, market value to book value, price per share, share price appreciation and other marketbased measures; CFP 2 is the second category for measuring CFP, incorporating accounting-based measures. Using the definitions of Beurden and Gossling (2008), this paper tests some indicators of economic performance, primarily focusing on the Market Value Added (MVA hereafter), as a summarizing indicator. In this manner our paper is a context of type CFP1.

One of the main aims of our work consists in building a CSR index that intersects two of the three main international indices (Domini 400 Social Index, Dow Jones Sustainability World Index, FTSE4Good Index), in order to partially solve the problem related to the multiple CSR definitions and certifications. Our second purpose, by using descriptive and stratigraphical analysis, is to verify whether some variables are statistically different in the CSR group with respect to the benchmark case (non-CSR). In this manner, we try to verify whether certain performance indicators can be affected by a firm's social responsible behaviour and their certifications.

Our main findings are that MVA is on average higher in the CSR group than in non-CSR firms. We also found that CSR certified firms have increased (and therefore there is an increase in firms with a low average MVA in the CSR group, thus lowering the average MVA in this group). MVA is also higher in US firms with respect EU ones.

[6] The central idea in stakeholder theory is that the success of an organization depends on the extent to which the organization is capable of managing its relationships with key groups, such as financers and shareholders, but also customers, employees, and even communities or societies.

Studying in depth our sample we have divided the firms into two groups: high and low profile, as defined by Roberts (1992). Our results show some interesting differences among the main variables between the two groups.

Our paper is organised as follows: in paragraph 2 the construction of the sample is explained, paragraph 3 shows the results of some descriptive statistics, paragraph 4 lists the main variables used in the literature and the main results formerly achieved respectively. Paragraph 5 shows the data used to run our analysis. In paragraph 6 the aim of this study is formalized and better explained and the complete results are shown. The conclusions are contained in paragraph 7.

2 The Sample

The first problem faced while building the sample is related to the redundancy of social certification. One way to overcome this problem is twofold: either to identify the best (most influential) rating agencies and take only the criteria that they express, or to use multiple assessments, so that the certification of an enterprise can be confirmed by several rating agencies. In our opinion, the most powerful way is to combine the two solutions, that is use multiple evaluation criteria characterized by good quality (Poddi, Vergalli, 2009). Therefore, our paper's first goal consists in defining a database of CSR firms that combine more than one certification index. In detail, we selected the firms for our sample following the steps below:

1. First, we assumed that the group of corporate responsible firms includes enterprises that belong at least to two of the three main stock option indices of the market in 2004[7] (i.e. Domini 400 Social Index, Dow Jones Sustainability World Index, FTSE4Good Index[8]). We then tried to complete the methodology used by Barnea and Rubin (2005) and by Waddock

[7] In this sense we took the most famous and recognizable indices at an international level. The choice of year (2004) was due to our need to include the highest number of firms in our sample, given the novelty of this peculiar economic phenomenon.
[8] For the stock market analysis, we referred to the following webpage: http://www.sustainable-investment.org/.

and Graves (1997). In this way, we obtained a sample consisting of 317 suitable firms.

2. In the second step, in order to build the control sample, we chose 100 non-CSR enterprises, to make it homogeneous for the sectors with the CSR sample. For each economic sector, several firms were randomly chosen from the Dow Jones Global Index.

3. The selection process generated a sample consisting of 417 firms. In order to generate the time series necessary for our analysis, we started with the 2004 sample, and maintaining the total number of firms we worked backward until 1999, changing the non-CSR/CSR ratio[9]. After building our database (see the appendix) we downloaded the balance sheets of all 417 firms, using Perfect Analysis software[10].

[9] We started from the 2004 sample and we created a dummy variable for each year from 2004 to 1999, imposing the number 1 if that firm was certified as a CSR company in that year and zero otherwise, by using the intersection (for a couple of sets) of the three indices. We were not able to work further back than 1999 because the CSR firms available in our database were not sufficient. For the FTSE index we referred to the website: http://www.sustainability-indexes.com/htmle/assessment/review2003.html; for the Domini Social Index the data refer to the Domini 400 SocialSM Index (DS 400 Index).

[10] Perfect Analysis contains the panel data of the stock prices, the level of dividends, and also other financial information about firms' balance, exchange rates and market indices. Moreover, it contains the main OECD economic indicators.

3. Descriptive Analysis

In Figure 1 we show the number of CSR firms from 1999 to 2009, according to the DJSI (Dow Jones Sustainability Index).[11] It is useful to observe how the diffusion of the CSR phenomenon is not homogeneous from the geographical point of view. In fact Figure 1 shows firms belonging almost all to developed countries.[12] The proliferation of sustainable indices may be a litmus test for diffusion of the phenomenon. It is not a coincidence that most of the sustainability indices arise in OECD countries. In the light of this insight, recent studies have observed that the phenomenon of social responsibility is influenced by the level of economic development. From figure 1, it can be seen that:

- the number of CSR enterprises has considerably increased, showing that "Corporate Social Responsibility" is a very relevant phenomenon and therefore requires detailed investigation;
- the highest number of CSR enterprises is from the United States and the European Union, i.e. two of the most developed areas. From this first rough observation, we can infer that GDP is a crucial variable for the development of ethical conscience, and therefore CSR.

In order to better describe our database and the growth of CSR firms, in figures 2 and 3 we show the number of CSR firms and the growth rate of our database.

From these, we can observe that the growth rate of the CSR enterprises seems to depend on the economic development of the area referred to, and is not only time-related. Although the EU has fewer enterprises than the USA, its growth rate is higher, probably because of a catch-up phenomenon. It is also important to note that the growth rate of the number of CSR enterprises has decreased since 2002. Does social

[11] In our previous paper (Poddi and Vergalli, 2009) we showed the number of CSR firms and their growth rates, by using the sample built as described above. In this version, we update our data and we try to show the most recent data. In detail, each year the DJSI creates a ranking of the most virtuous enterprises in terms of social responsibility. Since 2004 the number of firms belonging to the DJSI has been almost constant and equals 318. However, a large turnover among firms can be noted, which implies strong competition and also strong interest in the topic of CSR. Therefore, by calculating the total number of firms, certified at least once, and observing social evolution, it is possible to obtain an indication of the growth rate in the number of CSR firms. In figure 1, we have adopted this criterion.

[12] Nevertheless, it should be noted that the type of index adopted is of crucial importance: use of the DJSI influences selection of the sample in figure 1. In recent papers (i.e. Muller and Kolk, 2008), there is a study of CSR in emerging countries.

certification depend on economic trend? Why does this reduction not affect some countries that depend on the US economy, like the EU and Japan? The conjectures we tried to explain are:

a) Because the USA is the world's leading economy, it is also the first country to be hit by economic crisis[13], while other countries, even if they depend on the US economy, have a delayed reaction. This could explain why the EU growth rate was only slightly lower in 2002 but dropped the following year.

b) The number (flow) of enterprises strongly depends on the total number of firms that are CSR (stock). This means that if there are many CSR firms, the probability that new enterprises are certified as CSR is low and the ratio between the number of new enterprises and the total also decreases[14].

c) The financial crisis in the US (i.e. the Enron case[15] and Worldcom), probably reduced the credibility of some enterprises, changing the management priority and probably increasing certification control of CSR firms, thus delaying the certification of new enterprises.

[Figure 1 about here]
[Figure 2 about here]
[Figure 3 about here]

[13] It is useful to remember that 11th September 2001 considerably affected the US economy at the end of 2001 and at the beginning of 2002.

[14] Nevertheless, even if this explanation is plausible and verifiable when we are near the saturation point, this is extremely unlikely because the phenomenon is very recent. Moreover, this explanation does not explain the 2003 recovery.

[15] 16th January 2002.

4. Literature: Performance Measures

According to economic literature, the variables suitable for representing performance can be classified into accounting and market measures. The variables useful for pursuing the aim of this study belong to both these sets and are now briefly summarized.

4.1. Accounting measures

ROE (Return on Equity) (1999-2003). It is one of the most widely used performance measures (see: Bowman and Haire, 1975; Bregdon and Marlin, 1972; Perket and Eilbirt, 1975; Spicer, 1978; Preston, 1978; Cowen et al., 1987; Waddock and Graves, 1996, 1997; Preston and O'Bannon, 1997). This variable is given by the yearly net income of a firm (after preferred stock dividends but before common stock dividends) divided by the total equity (excluding preferred shares), expressed as a percentage, that is the rate of return of the risk capital invested by the shareholders. The information provided by this parameter is useful in order to estimate the profitability of a firm, that is its efficiency in generating earnings from every dollar/euro of net assets (assets minus liabilities).

ROA (Return on Assets) (1999-2003). It is a variable, expressed as a percentage, that measures the contribution of the assets of a company to the revenue generating process. This parameter is given by the ratio between net income and total assets. The ratio describes "what the company can do with what it has got", i.e. how many dollars/euros of earnings it can obtain from each dollar/euro of assets owned. Because the average level of this measure varies considerably depending on the economic sector, the ROA is mostly useful in order to compare the profitability of the companies belonging to the same industry. This measure also gives an indication of the capital intensity of a company, which also depends on the industrial sector. Another variable that usually affects the value of the ROA is the size of the company considered, because those that require a large initial investment are likely to generate a lower return on assets. The literature available concerning this measure

is very wide, see Aupperle, Carroll and Hatfield (1985), Belkaoui and Karpik (1989), Waddock and Graves (1997), Preston O' Bannon (1997), McWilliams and Siegel (2001) Luce, Barber and Hillman (2001).

ROCE (Return on Capital Employed) (1999-2003). It is used in finance in order to measure the return that a company is generating from capital employed. It is commonly used as a measure for comparing the performance between different businesses and to check if the return that is being generated is enough to pay back the cost of capital. This parameter is given by the ratio between the pre-tax operative profit and the employed capital. The main reference for the ROCE is Preston and O'Bannon (1997).

4.2. Market measures

MKTCAP (Market Capitalization). This variable is the most important market-based performance measure and there is a huge amount of literature on it: Moskowitz (1972); Vance (1975); Alexander and Buchholz (1978); Belkaoui and Karpik (1989); Patten (1990); Wright and Ferris (1997). The MKTCAP is given by the number of outstanding shares multiplied by their market price, hence it measures the value of a firm in terms of market capitalization.

Beta. The **beta coefficient** is a content of the Capital Asset Pricing Model (see: Treynor, 1961, 1962; Sharpe, 1964; Lintner 1965 and Jan Mossin 1966) whose importance has increased to become one of the best known variables in finance and investing. This parameter describes the relation that links the expected return of a financial portfolio (or a single stock) to the expected return of the whole market. The value of the beta coefficient can also be interpreted as a risk measure, because when its value is greater than one unit, the considered asset is likely to amplify the market fluctuations, while the opposite happens when its value is lower than 1. The main references for the beta coefficient are: Alexander and Buchholz (1978), Chen and Metcalf (1980) and Spicer (1978).

4.3. Mixed Measures

MVA (Market Value Added) (1999-2003). This measure, firstly introduced by Simerly and Li (2000), Cochran and Wood (1984), is given by the difference between the current market value of a firm and the capital contributed by investors, as of the balance sheet. This measure allows those companies that have been able to add value, whose MVA is positive, to be distinguished from those that have destroyed value, whose MVA is negative. Because the computation of this variable is based on both market and account values, it belongs to the mixed measures category.

4.4 Other Main Characteristics

The performance measures considered so far are not the only ones used in the economic literature in order to investigate the relationship between CSR certification and performance. More specifically, many studies have focused their attention on a variety of other important characteristics that can be linked to a firm's performance: size, industrial sector, age, leverage level and intangible expenditure.

4.4.1 Dimension

According to Waddock and Graves (1997), it is possible to assume that as the size of a firm increases, so does its behaviour to act responsibly. This happens because big companies are more likely to be conscious of the importance of their relationship with the public (and external stakeholders) than the smaller ones. The research of Orlitzky (2001) confirms that the size of a firm affects the link between CSR certification and performance: at the beginning of its life, the strategy of a firm is focused on basic survival, while the focus shifts to its ethical and philanthropic responsibilities as its size increases.

In the economic literature, the size of a firm has been measured by the number of employees, the total asset value or the total sales. Belkaoui and Karpik (1989) use the natural logarithm of the sales net value, while Trotman and Bradley (1981) use both the sales value and the total asset value. Cowen et al. (1987) and Patten (1991) also use the Fortune 500

index and the natural logarithm of sales. All these measures are quite similar and strongly correlated to each other, as shown by Kimberly (1976).

4.4.2 Industrial Sector

The industrial sector could strongly affect social certification. According to Dierkes and Preston (1997), those firms whose economic activities have effects on the environment or are involved in the exploitation of natural resources (mining, forestry, oil, gas and so on) are subject to stronger environmental controls than those belonging to other sectors. Moreover some enterprises that have a strong relation with consumers need to show a clear social behaviour, in order strengthen the firm's reputation and achieve positive effects on the sales volumes (see: Cowen et. al., 1987). Furthermore, Patten (1991) shows that the industrial sector (as a proxy of dimension) affects the "fame policy" of a firm, forcing the management to take public opinion into account (Belkououi, Karpik, 1989). Moreover, the industrial sector affects the number of enterprises belonging to the CSR group: sectors with high capital intensity have a lower number of firms than the low-labour intensity sector (i.e. banks, financial services, etc.)[16].

4.4.3 Age of Capital

Another variable that is likely to affect social certification is the 'Capital Age' of a firm. Roberts (1992) assumes that the firms historically highly involved in social investment have a greater induced reputation, making the stakeholders more confident about the expected profits. In the studies of Cochran and Wood (1984), the capital age is measured as gross and net capital: if this index tends towards 1, then the firm is relatively young. The result is that the age of capital is inversely correlated with the CSR variable. This means that the younger the enterprise, the higher the ethical investment. Indeed, it is important to note that new firms do not have transformation costs for new lines of production and that it is more expensive to change a firm's structure than to create a new one.

[16] On this point, see Waddock and Graves, 1999.

4.4.4 Intangible Assets Expenses

The economic literature is strongly focused on R&D expense, but our comment about this variable is that it is very similar to the total expense (also considering costs related to the CSR index). Indeed, R&D is a subset of total intangible assets and could also be used as a proxy variable of them. McWilliams and Siegler (2000) found that the R&D variable is directly correlated with the CSR index and financial performance. This relation is due to the fact that R&D expenses and innovation is one of the main variables that can affect economic growth in the medium-long run. Moreover, R&D expenses are sometimes assumed as a proxy for social certification.

4.4.5 Leverage

The leverage is given by the ratio between total debt and shares. Myers (1977), Wallace et al. (1994) have shown that there is a positive relation between the leverage and CSR index[17]. Jensen and Meckling (1976) supported this result by explaining that a firm tends to increase its social information in order to reduce rising monitoring costs from high leverage. A similar explanation was provided by Ahmed and Curtis (1999), who stressed that as the weight of the bond in the balance sheets increases at the expense of the ordinary stocks, so does importance of the social information and social certification.

Roberts (1992) tested the hypothesis that the higher a firm's leverage, the higher creditors' expectations, while not finding any statistical evidence to support this relation. However, the studies of Belkaoui e Karpik (1989) showed negative correlations.

4.4.6 Risk

Much research has studied whether there is a relation between market risk and social responsibility, defined by social disclosure.

The economic literature shows that those firms subject to high systemic risk use social certification in order to reduce their exposure risk: hence, their beta coefficient also decreases (see: Trotman and Bradley, 1981; Roberts, 1992). Richardson et al. (1999) and Botosan (1997) show that

[17] In this approach, CSR index is defined by social disclosure, that is social information.

increased social information can also reduce information asymmetries and accordingly the cost of capital, thanks to the reduction in the exposure to risk.

5 Data

Referring to paragraph 4 and using the Perfect Analysis database, the following performance variables were collected for 417 enterprises:

5.1 Accounting measures

ROE (Return on Equity) (1999-2003): this variable is fundamental as it defines economic performance - as highlighted in sub-4.1.

ROCE (Return on capital Employed) (1999-2003): it was decided to adopt ROCE as a variant of the more common ROA, due to the greater compatibility of data.

5.2 Market measures

MKTCAP (market capitalization). Data derived from Perfect Analysis, in the budget reports of each company – "Fundamentals" sheet; voice "Market Cap". Finally, it was decided to look at a mixed measure, mainly because it is more objective thanks to market related data.

5.3 Mixed measures

MVA (Market Value Added) (1999-2003). This measure identifies the "reputation" of business activity as the stakeholders' response to different company activity. This performance indicator was built using Perfect Analysis data with the following methodology: the company's market share value was estimated referring to July 2004 and multiplied by the number of shares at the closing share price on December 31st of each year (from 1999 to 2003). The Yahoo Finance website was the source for historical stock prices. The "stockholder's equity" is then subtracted from the equity market value in the social balance sheet of each company. We can therefore compare the economic value of stakeholders' equity (MV) and its book value, and then the market (and therefore stakeholders) can evaluate the business in place or in the future.

5.4 Other Variables

Each company differs in how it implements CSR. Differences depend on many factors such as, for example, the enterprise's size, the particular sector in which it operates, the corporate culture, stakeholders' demand and historically how progressive the company is in achieving CSR.

Some companies specialize in a single area, which they consider the most important or where they have the greatest impact or vulnerability (human rights, for example, or the environment), while others aim to integrate CSR into all aspects of their operations.

Other variables that influence CSR choice are as follows:

AGE (1999-2003) is the ratio between the net value and gross assets in property, buildings and equipment. The more this ratio tends to a value of one, the newer the company is. Data source: Perfect Analysis- "Property, Plant and Equipment - Total (Gross)" and "Property, Plant and Equipment - Total (Net)".[18]

INTA (Intangible Asset) (1999-2003) annual expenditure on intangible heritage, namely copyrights, patents, intellectual property and know-how. Intangible spending drives performance and can easily be used as an instrumental variable, which is also strongly correlated to CSR. Source: Perfect Analysis -"Intangible Assets - Total."

STLT (Short Term Debt / Long Term Debt) (1999-2003) is the ratio between short-term/long-term debt. Considering the important role of indebtedness, we wanted to discern its type. Data source: Perfect Analysis - "Common Size "ST Debt (% of Assets)" and "LT Debt (% of Assets)."

Intensity (intensity of work) (1999-2003): ratio between number of employees and total assets. In the Perfect Analysis database - "profits and losses", - data were collected on the number of employees under the heading "Employees Units". For total assets: balance sheet "total assets".

Size (1999-2003). Total sales has been used to define a company's size, as illustrated by Stanwick (1998), based on the work of Fonbrun and Stanley (1990) and Cowen et al. (1987), referred to in paragraph 4.4.1.

[18] The expectation against the use of this variable is defined as: "The latest companies behave more responsibly" (Cochran & Wood, 84).

GDP (1999 - 2003): data from the World Bank database.

6 Empirical Analysis

6.1 NPC Test: Stratigraphical Analysis

In this section we perform some stratigraphical analyses by using the NPC test software[19]. The purpose consists in verifying if some variables are statistically different in the CSR group with respect the benchmark case (non-CSR). In detail, we compare different variables such as MVA, SIZE, INTANGIBLE, ROE, ROCE, AGE and STLT in pairs of two groups (CSR, non-CSR, USA and EU, HIGH and LOW[20]) and the nil hypothesis that a variable of the first group is on average greater (or lower) than the variable of the other groups is tested. In the following tables we show our results, omitting the non-significant variables.

6.1.1 CSR vs. non-CSR

The first step is to compare CSR and non-CSR enterprises. Table 1 shows if the variable in the line is statistically greater for the CSR firms than for the non-CSR firms.

[Table 1 about here]

This first analysis shows that the variables most representative of the advantage of CSR are the MVA and the size, because the null hypothesis is often rejected with regard to the other variables. More specifically:

1. The CSR-MVA is always higher than NCSR-MVA, with a significance level of 95% (1999 and 2002) and of 99% (2000, 2001 and 2003);
2. The CSR firm size is always higher than the NCSR one, with a significance level of 95% (1999 and 2000) and of 99% (2001, 2002, 2003);
3. Intangible expenses are statistically higher in the first group only in 1999 and 2001, while they are not statistically different in the other years;

[19] NPC Test is able to do non-parametric tests to verify hypotheses. In general some parametric methods are used to verify hypotheses like normality of a distribution, which are hard to check. Instead, by using non-parametric methods, we compare different data permutations, and we test the nil hypothesis that the distribution, independently of its shape, is the same in the two groups.
[20] See section 6.1.3

4. The ROE is significantly higher only in one year out of five (2000).

By this cross section analysis, we understand that CSR-MVA is greater than non-CSR. Nevertheless, this result is still incomplete, because it is unable to provide information on the size of this gap or on its variability. To overcome this limitation, we introduce average MVA for the two groups, obtaining the following Table 2.

[Table 2 about here]

The analysis of the average MVA for the two groups shows two results:

1. There was a gap reduction in years 1999-2002 (mainly due to the greater reduction of CSR-MVA), but then it returned to growth in 2003;
2. Given that the MVA of both groups moves in the same direction, they probably have a common variable. This might be the economic trend, represented in our work by the Dow Jones Global Index (DJGI, hereafter). Indeed, if there is an economic crisis, it is probable that MVA decreases, *ceteris paribus*.

To confirm this second point, it is useful to compare the progress of the DJGI and the value of MVA for our two groups. This graph is shown in Figure 4, and it confirms that the MVA and the DJGI follow a common path.

[Figure 4 about here]

As previously anticipated, the MVA of the CSR group is higher than the non-CSR one. This is a consequence of a foresight in an uncertain context (investors bet on CSR enterprises, causing an increase in CSR shares) and of an increase in the firm's value (investors include a perfect evaluation of the firm in their investment decision).

Moreover, both groups have a higher evaluation than DJGI. Since all firms belonging to our sample have a higher MVA and the non-CSR group was built trying to maintain the same homogeneous sector structure as the CSR group, our conjecture is that the firms that want to

become CSR have a high MVA, introducing a distortion in our sample. The gap between non-CSR MVA and DJGI is therefore originated by the self-selection of enterprises in the CSR group.

The CSR firms are also larger than the non-CSR group over the entire period, with size levels measured by sales values. This result may depend on the greater financial resources owned by big enterprises with greater volume of sales (Waddock and Graves, 1997; Orlitzky, 2000). Hence, we observe higher expenses in intangible capital in CSR firms. This result is quite common in economic theory (McWilliams and Siegel, 2000): intangible capital also includes social expenses and also points to greater attention to social investment.

6.1.2 US vs. EU

The same analysis performed with regard to CSR and non-CSR firms is now extended to compare European (EU) and American (USA) firms. The results are shown in Table 3.

[Table 3 about here]

This analysis shows that:

- in 1999 the number of European CSR firms was significantly lower than in the United States. This has changed since 2001, as we can see from the growth rate of CSR firms in the EU and USA (see figure 3).
- Since 2000, Market Value Added has been significantly lower for EU enterprises. This was also supported by ROE and ROCE values. Our explanation is that since MVA includes the firms' value, the greater its value, the greater the expectations of economic growth, i.e. GDP growth rate. For this, the expectation in US firms' growth was higher than European firms, due to a more optimistic forecast for US growth. In conclusion, this could explain why US MVA is higher than the European one.

6.1.3 High vs. Low profile

The third application of the stratigraphical analysis regards the comparison between industrial *High* or *Low Profiles*. According to Roberts (1992), an industrial sector is defined as "high profile" if it is well-known by customers to have high political risk, e.g. high competition, such as oil, chemical, mining, forest, paper, cars, aeroplanes, energy, transport, tourism, agriculture, tobacco, alcohol, communication and media. Otherwise, the "low profile" industrial sector is a residual definition that comprises all the others. The definition of "low profile" industrial sector includes all the other trades, such as food, health, electrical equipment, textile, clothing, retailing, medical provision, real estate.

In the literature, it is assumed that industrial sector characteristics can affect corporate social choice and therefore social performance. For example, different industrial sectors can face different risks. Fombrun and Shanley (1990) found a strong correlation between risk and stakeholder assessment. Moreover, other important sector features (such as dynamism, etc.) are considered key factors of social performance. The results are shown in Table 4.

[Table 4 about here]

This analysis highlights the following points:

1. There is no statistically significant difference between high and low profiles for social certification (CSR) or ROE;
2. MVA is considerably higher between 2000 and 2003 for low profile;
3. ROCE is higher in low profile, only for 1999;
4. Intangible expenses are higher in high profile companies (years 2000-2003);
5. Low profile firms are younger than high profile ones;
6. The short term debt over long term debt ratio is higher in low profile companies in 1999 and 2001, but is lower in 2003.

The difference between high and low profile, according to the CSR index, is not significant[21].

With respect to the MVA value, the high profile group is more volatile, which would imply that stakeholders believe that their shares are more risky. This could explain a relatively worse performance evaluation than for low profile companies. Furthermore, there are always more CSR firms in the low profile. Therefore, if a CRS firm has a high MVA level, this indicates that there are more CSR firms in a particular group thus increasing the MVA average for that group.

Moreover, the level of intangible capital expenses in the high profile is high, as expected, because this group includes firms with high technology that are highly motivated to spend on research and development. Otherwise, the low profile is composed by corporations operating in "traditional sectors", characterized by lower levels of innovation.

Then, with respect to firms' AGE, the analysis shows that low profile enterprises are the most recent. This could be explained by underlining that the high profile ones are generally oligopolistic companies which have been operating for decades.

Lastly, the results regarding the debt and the ROCE are insufficient or too ambiguous to provide concrete evidence.

6.1.4 In detail: USA vs. EU

In this paragraph we performed the stratigraphical analysis again, in order to investigate if the relevance of the advantage of CSR firms is different between US and EU. The results of this analysis are shown in Table 5 and 6.

[Table 5 about here]

[Table 6 about here]

The evidence from these results concerns mainly the MVA and the age of the firms. More specifically, there is no univocal statistical result concerning the relation between profitability and CSR variable for the US. This could depend on a high US MVA independent of qualitative

[21] This is due to the methodology we adopted to define the CSR sample and the control sample, which by definition had to be equivalent. However, by working backward the two different databases are not statistically different.

features. We can see that MVA volatility is higher in CSR enterprises than in the control. We can also see that during a negative period, CSR-MVA tends to drop sharply, converging towards the non-CSR level. In 2001, the US had a short-term peak followed by reduced growth (figure 3) of CSR enterprises on the Dow Jones. Here, the MVA level of CSR enterprises may converge smoothly towards non-CSR values. However, it was in any case higher than in the European market.

The lack of univocal statistical results could mean weak public support for a firm's critical behaviour. Critical demand in the US is not binding and investment choice to become CSR has a different rationale (trying to forestall critical growth or adapting investment choice to other markets).

For the EU, there is strong evidence that the MVA-CSR relationship is positive. Concerning the reason for this we must bear in mind that critical demand is more developed in the EU than in the US, as underlined in MORI (Market and Opinion Research International) and this can also be supported by the political approach of the EU and US to environmental problems (e.g. ratification of the Kyoto Protocol). Moreover, we can see that the US crisis only weakly affected the EU market, indeed the EU's reduced growth is mainly due to internal causes. A weak shock therefore implied a lower MVA reduction. CSR firms therefore maintain a higher level of MVA.

With regard to age, our results seem to support Cochran and Wood (1984). The value of this variable is higher for CSR firms, which means they are more recent. We believe that the more recent a firm is, the lower the costs are to change labour organization or to invest in innovation. However, in the case of the EU, the results are less clear, and the relationship between CSR and AGE is not statistically significant.

6.1.5 In detail: USA vs. EU

In this paragraph we performed the last stratigraphical analysis, in order to investigate if the relevance of the advantage of CSR firms is different between high and low profile firms. The results of this analysis are shown in Table 7 and 8.

[Table 7 about here]

[Table 8 about here]

From these results, we can conclude that, with regard to low profile companies, on average both the MVA and the size are higher in the CSR group for all the period considered, with the only exception of 1999. Moreover, CSR expenses in intangibles are higher only in the first three years of the sample, later losing its significance.

Concerning the high profile companies, the only significant variable is the expense in intangibles, which is higher for the CSR group, in the first two years of the sample.

It can be confirmed that the MVA for the CSR group is higher than for the non-CSR enterprises, and statistically relevant only for less volatile low profile. CSR enterprises are bigger, which could depend on the higher resource level of CSR firms. The difference between LOW and HIGH could depend on a minimum critical dimension of a LOW profile enterprise. For HIGH profiles, the firms are obliged to obtain independent certification, if this is part of the firm's ex-ante investment strategy.

Finally, in both cases, expenses in intangibles is higher for CSR firms. Because research and development is considered as an intangible, it is often used as a proxy of the CSR index.

6.2 Correlations among variables

In Table 9 the correlations (computed on 2001 data, which is the most representative year[22]) between all variables considered are shown.

[Table 9 about here]

The analysis of the correlations allows us to conclude that:

1. The MVA is positively correlated with CSR variable and size;
2. The size is positively correlated with expenses in intangibles;
3. CSR is strongly correlated to dimension and intangibles, which are positively correlated with the age of the firms.

We can also see that MVA seems to be linked with the CSR index, while the bigger the firm's size, the higher its value. Given that the size took account of total sales and given that more business meant better performance for investors, then the MVA-SIZE relation is in line with our results. The most recent firms spend more in intangibles, due to the start-up procedure of a firm that includes copyright, R&D and innovation technology costs.

7 Conclusion

Our work has tried to verify whether certain performance indicators can be affected by a firm's social responsible behaviour and by its certification. One of the novelties of our analysis comes from the building of a CSR index that intersects two of the three main international indices (Domini 400 Social Index, Dow Jones Sustainability World Index, FTSE4Good Index). We also performed some stratigraphical analyses to verify whether some variables are statistically different in the CSR group with respect to the benchmark case (non-CSR). In detail, we compared different variables such as MVA, SIZE, INTANGIBLES, ROE, ROCE, AGE and STLT in pairs of two groups (CSR, non-CSR, USA and EU, HIGH and LOW) and the nil hypothesis

[22] For other correlations, see Poddi, L. (2005).

that a variable of the first group is on average greater (or lower) than the variable of the other groups was tested.

A first simple approach gives us some interesting results concerning aspects that, as far as we know, have not yet been discussed in the economic literature. Indeed, the results of our first statistical study showed that the considerable growth of CSR firms over the last ten years is not homogeneous across countries of the world. Indeed, there is a certain asymmetry of this phenomenon. Initially, it would seem that this asymmetry is due to the link between CSR firms and economic development. Intuition tells us that only when there is a certain level of economic development pro capita will the so-called 'critical sense' of an individual develop. This intuition is underlined by the fact that CSR firms have increased substantially almost exclusively in Europe and the United States.

The second result of our descriptive analyses illustrates that this relation shows a lag, the length of which depends on the influence that certain independent factors have on the dependent ones. This is not surprising as it is reasonably logical that the perception of a certain 'status' can only occur with a temporal lag and that this can in turn be explained by dependent variables.

The following observations have shown that there is a difference in the development of CSR in the two main geographical areas: on the one hand the US has more CSR firms while Europe has a higher growth rate of CSR firms which would point to a convergence of the two areas. The following stage is the research for a clear reply to our main question; what relation exists between performance and CSR? As a performance yardstick, we have used what would appear to be the most complete measure in the literature given that it is a solution to the slowness of accounting measures and the subjectivity of investors to market measures. Due to lack in the literature of a single definition of the performance-CSR relation and also its origin, we have used a specific analytical statistic to determine the sign of this relation. From the data we have gathered, it would seem that there is a clear positive relation, i.e. CSR influences performance.

During calculation of this analysis, we used NPC software which can perform layered studies by comparing certain groups with the variables examined (MVA, CSR, ROE, ROCE, INTA, AGE, etc.). These groups have been defined on a geographical basis, from a low to high industrial profile, and according to whether the firms belong to the group of CSR firms. The principal findings are that MVA is on average higher in the CSR group than in non-CSR firms. We also found that CSR certified firms have increased (and therefore there is an increase in firms with a low average MVA in the CSR group, thus lowering the average MVA in this group). MVA is also higher in US firms with respect to EU ones. This result would seem to support what we have stated in the descriptive analysis. Studying our sample in depth, we divided firms into two groups: high and low profile, as defined by Roberts (1992). Our results show some interesting differences among the main variables between the two groups.

Subsequently we presented and interpreted the correlation between all these variables. In particular, we focused on MVA as a performance variable, comparing it with two other typical variables ROE and ROCE.

An interesting development of the analysis performed in this paper could be to compare MVA with a Tobin study, using a real option approach that would seem to be in line with our own results.

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Tables

Table 1: Stratigraphical Analysis[23]

	1999	2000	2001	2002	2003
MVA	NCSR<CSR **	NCSR<CSR ***	NCSR<CSR ***	NCSR<CSR **	NCSR<CSR ***
SIZE	NCSR<CSR **	NCSR<CSR **	NCSR<CSR ***	NCSR<CSR ***	NCSR<CSR ***
INTA	NCSR<CSR **	-	NCSR<CSR ***	-	-
ROE	-	NCSR<CSR **	-	-	-

The asterisks show the significance level to accept the nil hypothesis (* = 90%, ** = 95%, *** = 99%), while the dash means that the two groups are not statistically different.

Table 2: comparison between CSR and NCSR

Average levels	1999	2000	2001	2002	2003
MVA CSR	36,968.92	25,363.29	20,231.74	12,324.95	16,655.41
MVA NCSR	19,901.77	14,064.49	8,881.49	7,147.39	9,199.32
GAP	17,067.15	11,298.79	11,350.25	5,177.55	7,456.09

Table 3: focus on EU and US firms

	1999	2000	2001	2002	2003
CSR	EU<USA ***	EU<USA ***	-	-	-
MVA	-	EU<USA **	EU<USA ***	EU<USA ***	EU<USA ***
INTA	EU<USA **	-	-	-	-
ROE	-	-	-	EU<USA *	-
ROCE	EU<USA **	-	-	-	-
AGE	-	-	-	-	*EU>USA* ***

Table 4: HIGH-LOW profile

	1999	2000	2001	2002	2003
CSR	-	-	-	-	-
MVA	-	HIGH<LOW **	HIGH<LOW ***	HIGH<LOW ***	HIGH<LOW ***
ROCE	HIGH<LOW ***	-	-	-	-
INTA	-	*HIGH>LOW* ***	*HIGH>LOW* ***	*HIGH>LOW* ***	*HIGH>LOW* **
AGE	HIGH<LOW ***	HIGH<LOW ***	HIGH<LOW ***	HIGH<LOW **	HIGH<LOW **
STLT	HIGH<LOW ***	-	HIGH<LOW ***		*HIGH>LOW* ***

[23] Tested variables are ordered in rows in the table and the results are shown for years 1999-2003. The null hypothesis that a variable of the first group is on average greater (or lower) than the variable of the other groups is tested.

Table 5: US Stratigraphical Analysis

	1999	2000	2001	2002	2003
ROE	*NCSR>CSR* **				NCSR<CSR **
MVA			NCSR<CSR **		
AGE	NCSR<CSR **	NCSR<CSR **		NCSR<CSR **	

Table 6: EU Stratigraphical Analysis

	1999	2000	2001	2002	2003
ROE		NCSR<CSR **	NCSR<CSR ***	-	-
MVA	NCSR<CSR ***	NCSR<CSR ***	NCSR<CSR ***	NCSR<CSR **	NCSR<CSR ***
SIZE	NCSR<CSR ***	NCSR<CSR ***	NCSR<CSR ***	NCSR<CSR ***	NCSR<CSR ***
AGE	-	*NCSR>CSR* **	-	-	-
INTA	NCSR<CSR **	NCSR<CSR *	NCSR<CSR ***	-	-

Table 7: LOW Profile Stratigraphical Analysis

	1999	2000	2001	2002	2003
MVA	NCSR<CSR **	NCSR<CSR ***	NCSR<CSR ***	NCSR<CSR **	NCSR<CSR **
SIZE	-	NCSR<CSR ***	NCSR<CSR ***	NCSR<CSR ***	NCSR<CSR ***
INTA	NCSR<CSR *	NCSR<CSR *	NCSR<CSR *	-	-

Table 8: HIGH Profile Stratigraphical Analysis

	1999	2000	2001	2002	2003
INTA	NCSR<CSR *	NCSR<CSR *	NCSR<CSR ***	-	-

Table 9: Correlations[24].

Correlation 2001	CSR	MVA	ROE	SIZE	AGE	INTA	INTENSITY	STLT	GDP
CSR	1								
MVA	**0.1691 *****	1							
ROE	0.0017	0.0712	1						
SIZE	**0.1375 *****	**0.4034 *****	-0.058	1					
AGE	0.0327	0.0692	0.006	0.047	1				
INTA	**0.1186 ****	0.0028	-0.070	**0.252 *****	**0.169 *****	1			
INTENSITY	-0.019	-0.072	**0.2343 *****	- 0.097 *	- 0.066	- 0.086 *	1		
STLT	0.0325	0.0593	- 0.005	- 0.034	- 0.049	- 0.043	0.0171	1	
GDP	0.0400	0.0734	- 0.011	0.039	- 0.121	- 0.029	0.0132	- 0.01	1

[24] Our first consideration is that the correlation coefficient (r of Pearson) is low in all cases. Therefore, even if there is a significant correlation, it is weak. This implies that it does not totally explain our phenomenon. We need a formal model in regression. This could solve the multi-collinearity problem among variables in the model we will look at.

Figures

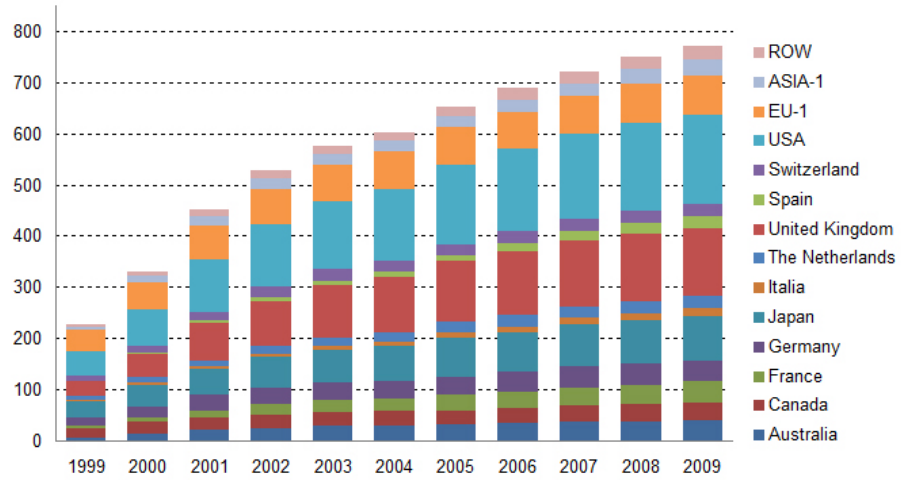

Figure 1: ROW includes Brazil, Chile and South Africa, EU-1 includes Austria, Belgium, Denmark, Finland, Greece, Ireland, Norway, Portugal, Sweden; ASIA-1 includes India, Indonesia, China, Malaysia, Singapore, Thailand, Taiwan, Hong Kong.

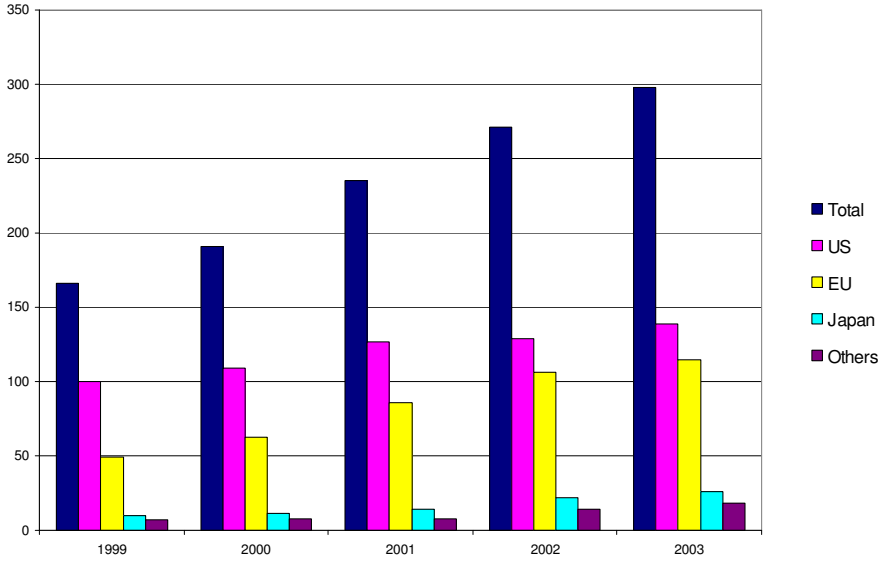

Figure 2: number of CSR firms

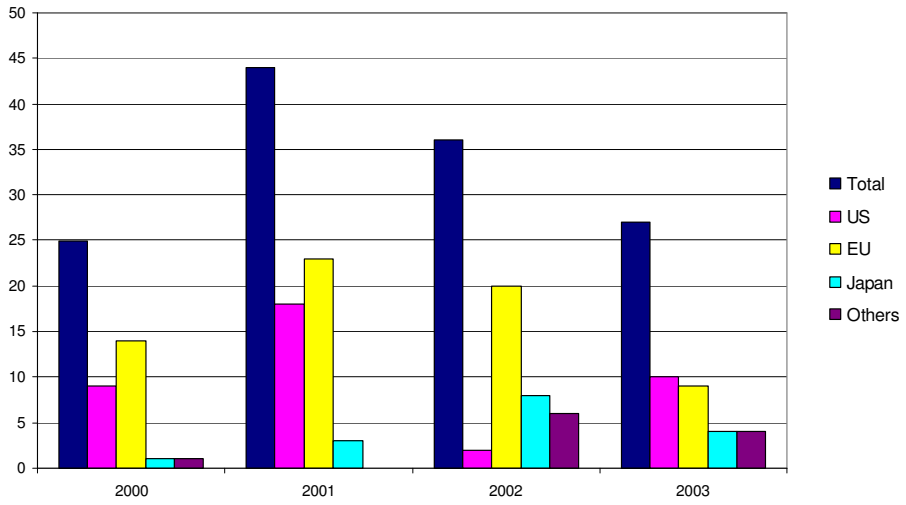

Figure 3: Growth rate of CSR enterprises
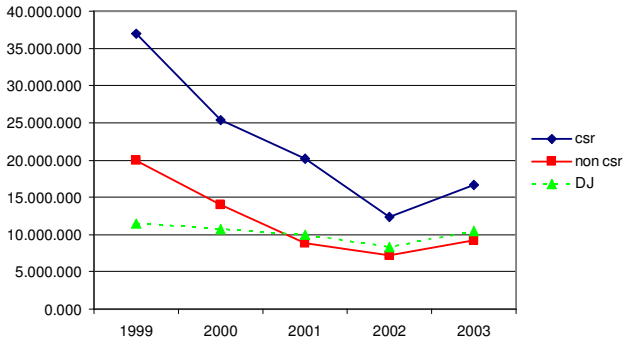
Figure 4: Comparison between the Dow Jones and MVA