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Is social responsibility driven by industry or firm-specific factors?

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Abstract

Purpose – This study aims to revisit the relative importance of industry and firm level effects on corporate social responsibility (CSR), with the objective of clarifying their diverse effects on CSR.

Design/methodology/approach – The authors suggest that CSR is a shared strategic asset based on insights from the industrial organization and institutional schools, taking into account that there are determinants of CSR that may be operating inside the corporation according to the resource-based view. They employ a variance components method and a sample compiled of 495 US firms from 19 industries using five-year periods.

Findings – The study indicates that firms retain considerable self-determinism regarding their CSR trajectories, but the latter also represent a shared strategic asset. Thus, these results combined imply that CSR needs to be examined on both levels simultaneously.

Practical implications – The results of this study can provide non-governmental organizations and governmental and regulatory institutions with an indicator that explains the performance variation levels of each dimension of CSR, and can help improve tools designed to promote it. Furthermore, the authors' research provides managers with evidence of CSR variability among CSR dimensions that could help in strategic decision-making. In addition this research can provide assistance and give perspective regarding selection criteria for investment portfolios in responsible investment funds.

Originality/value – The industry effect is an important factor to consider in CSR intensity. The variation in firm and industry effects on CSR strategies has not been extensively studied; hence, explaining the sources of performance differences regarding industry and firm factors is a key theoretical and empirical issue in the field of management.

Keywords Social responsibility, Firm effects, Industrial organization, Industry effects, Institutional theory, Resource-based view, Companies

Paper type Research paper

1. Introduction

Over the past two decades, corporate social responsibility (CSR) has been the focus of significant attention by a proliferation of conceptual and empirical works (e.g. Campbell, 2007; Kacperczyk, 2008; Padgett and Galan, 2010; Moura-Leite *et al.*, 2011; Surroca *et al.*, 2009; Waddock and Graves, 1997). The literature has paid particular attention to the relationships between CSR and financial performance (see Orlitzky *et al.*, 2003; Margolis and Walsh, 2003; Margolis *et al.*, 2007), most works finding a positive effect of CSR on financial performance. Furthermore, although some studies found the industry effect to be an important factor to consider in corporate social responsibility intensity (e.g. Brammer and Pavelin, 2006; Hull and Rothenberg, 2008; Russo and Fouts, 1997), according to Wood's (2010) literature review, only one research has examined the variation in firm and industry effects on CSR strategies (O'Shaughnessy *et al.*, 2007, covering 130 Japanese firms).

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Explaining the sources of performance differences regarding industry and firm factors is a key theoretical and empirical issue in the field of management. The industrial organization view usually argues that industry factors are the primary determinants of firm performance and strategy, while the resource-based view argues that the firm's internal environment drives competitive advantage. Since the initial works by Schmalensee (1985) and Rumelt (1991), a number of empirical studies have examined the relative importance of firm and industry factors (e.g. Chang and Singh, 2000; Mauri and Michaels, 1998; Short *et al.*, 2007). Differing from the previously cited strategic studies, Mauri and Michaels (1998) analyzed variance components of the firm and industry effect on core strategies, Research and Development (R&D) intensity, and advertising intensity. Their findings suggest that firms competing in the same industry tend to develop homogeneous competitive strategies; in line with institutional theory (DiMaggio and Powell, 1983) managers try to reduce the strategic gaps with relevant competitors to gain legitimacy in the eyes of institutional investors and other important stakeholders. Thus, we need to pay attention to the institutional mechanisms that may have a bearing on whether or not corporations act in socially responsible ways (Doh and Guay, 2006).

In line with previous research (e.g. Hillman and Keim, 2001; Surroca *et al.*, 2009) we assume that CSR positively affects organizational performance and is sustainable in the long term (Bruch, 2005), thus representing a strategic asset (Székely and Knirsch, 2005). However, it differs from many other types of strategic assets since its value is determined not only by the CSR of the focal firm, but also by the CSR of other firms in its industry (Porter and Kramer, 2006). CSR is influenced by market, institutional and environment forces that shape the industrial context. As a consequence, we expect that a significance portion of the variability in CSR is attributable to industry-level factors, hence we follow O'Shaughnessy *et al.* (2007) and suggest that CSR is a shared strategic asset, keeping in mind that there are determinants of CSR that may be operating inside the corporation (Campbell, 2007). Our research analyzed variance components of the firm and industry effect on CSR to answer the following question: To what extent do industry and firm factors explain the variance in CSR?

CSR is conceived as a broad construct that is composed of primary stakeholder management and social issue participation. Primary stakeholder management was studied in a decoupling form, by stakeholder dimensions, in early studies (e.g. Berman *et al.*, 2006; Hillman and Keim, 2001; Kacperczyk, 2008), with each dimension having distinct characteristics. According to Mitchell *et al.* (1997, p. 868), "stakeholder attributes are socially constructed, not objective, reality", and therefore it is necessary to identify the characteristics and perceptions of each stakeholder and their relationship with the firm.

In this research we analyze each dimension of primary stakeholder management through individual construct variations in order to increase our understanding of CSR differences between firm and industry factors. We contend that this better grasp of CSR variance can meaningfully contribute to both theory development and management (practice). In terms of theory development, most work on corporate social responsibility issues adopts the assumption that it is driven by firm specific factors and that they are the outcome of strategies involving structure, ownership, resource allocation and managerial decisions regarding corporate goals (McWilliams *et al.*, 2006). As we have stated before, there are reasons to expect that a firm's social

responsibility may also be profoundly influenced by the industrial context. We will discuss this in the following section.

There are, moreover, many practical concerns of interest to various groups as a result of our study. For example, it can provide non-governmental organizations and governmental and regulatory institutions with an indicator that explains the performance variation levels of each dimension of CSR, and can help improve tools designed to promote it. Moreover, our research provides managers with evidence of CSR variability among CSR dimensions that could help in strategic decision-making, and besides the perspective of responsible investment funds, it can also provide assistance regarding selection criteria for their investment portfolios.

To explain the importance firm and industry factors have on CSR, we employ a variance components method previously used in strategy and economic literature to investigate the sources and structure of corporate profitability (e.g. Hawawini *et al.*, 2003; Mauri and Michaels, 1998; McGahan and Porter, 1997; Roquebert *et al.*, 1996). The variance components method is a statistical tool that assesses how much variability existing in the dependent variable (in our case the CSR proxy) can be attributed to each independent variable (firm, industry, year, industry-year interaction). Using this approach, we evaluate the extent to which observed variation in the dependent variable is attributable to influences found at firm and industry levels of analysis. In order to identify certain distinguishing characteristics of CSR variables and also to shed new light on how other corporate performance outcomes vary systematically across firms and industries with the same sample, we also perform variance components analysis on a measure of corporate financial performance and compare these findings to our CSR results.

2. Corporate social responsibility levels

Firm effects capture the unique firm characteristics that influence the variation in CSR across industries and firms, whereas industry effects refer to attributes common to a specific industry. The dominance of firm effects suggests heterogeneity because of barriers to imitation (Rumelt, 1991) and the inability of firms to change their resource endowments over time (Carroll, 1993). In contrast, the dominance of industry effects over time shows the similarities in response to industry conditions and the imitation of successful social responsibility strategies.

With a view to understanding CSR variation at industry level, this research adopted the industrial organization view – a firm's strategy is primarily determined by industry membership and its common market structure (Hawawini *et al.*, 2003; Roquebert *et al.*, 1996; Rumelt, 1991) which also applies to the institutional theory – the performance of firms in the same industry tends toward similarity because they share common influences (DiMaggio and Powell, 1983; Bansal, 2005; Jennings and Zandbergen, 1995). In terms of firm level we therefore adopted the resource-based view, which inherently provides an explanation for firm effects on CSR outcomes within the same industry (Barney *et al.*, 2001), and the slack resources perceived (Waddock and Graves, 1997).

2.1 Firm-level evidence

Some of the main contributors to the resource-based literature in the strategic management field have acknowledged business ethics/corporate social responsibility

(Barney *et al.*, 2001) and determinants of firm performance (Short *et al.*, 2007) as areas of study with important implications. Strategy-related research in the past has paid specific attention to resources as important sources of performance (e.g. Andrews, 1971; Penrose, 1959); however, it was Wernerfelt (1984) who first coined the term "resource-based view of the firm". While Wernerfelt (1984, p. 172) suggested that a resource can be "anything which could be thought of as a strength or weakness," more recent approaches to studying resources tend to be more specific, focusing on a wide variety of tangible and intangible resources and capabilities. Barney (1991) maintains that if these resources (tangible and intangible) and capabilities are valuable, rare, hard-to-duplicate and non-replaceable, they can constitute a source of sustainable competitive advantage. Peteraf (1993) has developed a model that states that for a company to have a competitive advantage, it needs resource heterogeneity, ex-post limits to competition, imperfect mobility of resources, and ex-ante limits to competition.

Moreover, Prahalad and Hamel (1994) reaffirm Wernerfelt's (1984) argument against the industrial organization approach and reinforce the resource-based view, which states that a firm's success is not wholly determined by external factors but also by its internal characteristics – those that are the core of its resources. According to these criteria, resources that may lead to a competitive advantage include socially complex and causally ambiguous resources such as reputation, knowledge assets, long-term relationships with suppliers and customers, and corporate culture (Barney, 1986). For example, since a firm's culture is an intangible resource that is difficult to imitate (Barney *et al.*, 2001), for firms such as Ben and Jerry's, Johnson & Johnson, and the Body Shop, concern for ethics can become embedded in a culture in ways that are inimitable (Barney *et al.*, 2001). As the diverging track records of these three firms illustrate, however, a uniquely ethical culture does not necessarily translate into superior CSR, since CSR is a multidimensional construct (Waddock and Graves, 1997) and ethical culture is just one factor that influences CSR.

The first theoretical paper to apply the resource-based view framework to corporate social responsibility was by Hart (1995), who focuses exclusively on environmental social responsibility. Hart asserts that, for certain types of firms, environmental social responsibility can constitute a resource or capability that leads to a sustained competitive advantage. Also using the resource-based view framework, a more formal theory-of-the-firm model of profit maximizing corporate social responsibility has been posited by McWilliams and Siegel (2001). These authors outline a simple model in which two companies produce identical products, except that one firm adds an additional "social" attribute or feature to the product, which is valued by some consumers or, potentially, by other stakeholders. In this model, managers conduct a cost/benefit analysis to determine the level of resources to devote to corporate social responsibility activities/attributes.

In fact, the resource-based view is a theory that focuses on the firm level, with implicit independence of context, to explain a firm's performance. Nevertheless, there is an ongoing debate on how isolated resources are from their context in the resource-based view. On the one hand, resources in the resource-based view are deemed to be important regardless of the industry (Barney *et al.*, 2001); the resource characteristics of inimitability and rarity, for example, could be argued as absolute characteristics (not relative to any specific industry). For example, a resource that provides superior CSR must be rare across the economy, not simply in one industry

(since a rival could import it from outside that industry). On the other hand, Wernerfelt (1984), Peteraf (1993) and others observe that resources and the firms that possess them affect economic performance based on the interaction with the specific industry of use. Similarly, Russo and Fouts (1997) assert that the social performance of firms (especially environmental performance) can be a source of competitive advantage, particularly in the same industries. Nevertheless, what these two sides of the resource-based view have in common is the implication that firm performance levels differ substantially based on differences in their resource profiles.

Moreover, Bansal (2005) proposes that the variation in CSR is defined by resource-based factors. Indeed, the application of resource-based rationales to corporate social responsibility and disclosure can be justified by several reasons (Bansal, 2005): it creates new resource-based opportunities through changes in technology, legislation, and market forces; it influences a firm's financial performance; it requires the investment of financial and/or human resources. As CSR requires investment, Waddock and Graves (1997) affirm that better financial performance potentially results in the availability of slack (financial and other) resources that provide an opportunity for companies to invest in social performance domains. Consequently, social responsibility should assume the same variation behavior of financial performance, which is identified to be larger on firm level than on industry level (e.g. Rumelt, 1991 – firm level was measured by corporate and business level effects). Therefore, consistent with the resource-based view and with the slack resources perceived, in our empirical analysis we expect CSR within industries to vary systematically with differences in firm-level characteristics.

2.2 Industry-level evidence

The characteristics of a firm's industry have been hypothesized to be a key influence on its social responsibility (e.g. McWilliams and Siegel, 2000). Industry plays a moderating role in social responsibility intensity because of the presence of industry-specific stakeholder pressures for improved social responsiveness. Likewise, industrial organization researchers have argued that strategy and performance are primarily determined by the membership of an industry and are sustained through entry barriers (Rumelt, 1991). From this perspective, the common structural elements of an industry lead its members to share competitive characteristics. While successful firms develop resources producing a competitive advantage, other firms are able to reduce competitive gaps by imitating these valuable resources. As a result, convergent patterns of competition can become common industry characteristics over time (Mauri and Michaels, 1998).

Furthermore, based on the industrial organization paradigm, the structural determinants of competition lead firms to develop strengths based on Key Success Factors that are stable and externally determined by the industry environment (Vasconcellos and Hambrick, 1989). Therefore, Amit and Schoemaker (1993) have sought to replace the strategy field's concept of Key Success Factors with the notions of:

- strategic industry factors, the set of resources and capabilities that have become the prime determinant of economic rents for industry participants; and
- strategic assets, a firm-level construct, referring to the set of firm-specific resources and capabilities.

This approach implies that firms in an industry converge towards competitive parity, thus enhancing their chances of survival (Barney, 1991). When there is no clear understanding of the means to an end relationship, firms should imitate the more observable aspects of successful strategies. Managers pursuing the Key Success Factors approach pursue strategic benchmarking aimed at decreasing competitive gaps (Chen, 2005).

Several schools within industrial organization have proposed market structure as the primary explanation for the emergence of common patterns of behavior and similar performance outcomes for firms in the same industry. However, some of its schools differ regarding the dynamics of industry structure. The traditional Harvard school (Bain/Mason) views market structure as exogenous and stable (Porter, 1981), while the Schumpeterian and Chicago schools (Demsetz/Stigler) view market structure as dynamic and constantly evolving. The Chicago school believes in the convergence of competitive patterns over the long term when less successful firms imitate the strategies of more successful ones (Conner, 1991). Similarly, the Schumpeterian school focuses on revolutionary innovations that make rivals' positions obsolete and change industry structure (Conner, 1991). Despite these differences, the literature on industrial organization treats the industry as the unit of analysis, implicitly assuming that firms within an industry are homogeneous.

Mauri and Michaels' (1998) findings suggest that firms competing in the same industry tend to develop homogeneous competitive strategies for investing in technology and marketing resources. The results are consistent with institutional theory. In contrast to the resource-based theory's focus on firm heterogeneity, institutional theorists ask "why there is such startling homogeneity of organizational forms and practices" (DiMaggio and Powell, 1983, p. 148). Institutional theorists argue that organizations in the same industry tend toward similarity over time because they share many common influences and are interpenetrated by relationships that disseminate common knowledge and understandings (DiMaggio and Powell, 1983). From an institutional perspective, social and economic interrelations among firms and common dependencies on a range of external actors are sources of pressures for isomorphism or conformity that give rise to firm homogeneity. Isomorphism pressures (DiMaggio and Powell, 1983) refer to influences for conformity exerted on firms by the government, professional associations and other external constituents that define or prescribe socially acceptable economic behavior. These pressures cause firms to tend toward homogeneous structures and strategies (DiMaggio and Powell, 1983), reduce uncertainty on the market (Jennings and Zandbergen, 1995) and lead to legitimacy (DiMaggio and Powell, 1983).

According to Deephouse and Carter (2005), industry faces strong institutional and competitive pressures, which means that legitimacy and reputation are important, with the former being the social acceptance resulting from adherence to social norms and expectations, and the latter a social comparison among organizations on a variety of attributes. King *et al.* (2002) deal with the "reputation commons problem", describing how members of the same industry are often "tarred by the same brush" as a consequence of the misdeeds of one of its members. For example, pollution is generally thought of as pure externality and the marginal impact of each firm's pollution sometimes cannot be determined, as this requires considerable amounts of information. If such information is not available or is costly to acquire, stakeholders may then

identify a group of firms or an industry type that may have harmed a resource and distribute the responsibility for any damage equally among its members (King *et al.*, 2002). Thus, recognizing that the actions of one firm can seriously affect the reputation of others in the same industry, and because firms fear that state regulation is insufficient to protect the industry, many industry groups have embarked on strict self-regulation programs in order to prevent reputation-damaging activities (King and Lenox, 2000). Likewise, industry culture can be determinant of the awareness of, and orientation to, social responsibility at firm level. Baucus and Near (1991) found that differences in industry culture predicted illegal behavior, as actors within industries tended to look to each other to determine standards of behavior.

Furthermore, stakeholders normally advocate industry-wide compliance mechanisms, as these lower their contract writing and monitoring costs, but firms require stakeholders to be strong (power, legitimacy and urgency, Mitchell *et al.*, 1997) to provide a counterbalance to corporate self-interest power (Campbell, 2007). In fact, firms tend to imitate the visible and well-defined activities of relevant competitors to gain legitimacy in the eyes of institutional investors and other important stakeholders. Accordingly, shared industry characteristics such as market structure, public visibility, media attention, scrutiny from government, culture and configurations of stakeholders lead to a convergence of CSR among firms in the same industry and differences across industries. Therefore, the shared competitive context and institutionalist mimicry support our expectations that CSR varies systematically with differences in industry-level characteristics.

Just as certain factors may be relevant in one industry but not in another, they can be relevant at one given moment but not at another. In other words, in explaining performance, transient effects must be distinguished from stable effects (Rumelt, 1991). Accordingly, most studies investigating the relative size of industry and firms' effects have incorporated variance over time into their analyses, and have tried to capture year effects, or the macroeconomic fluctuations in firms' activity (Hawawini *et al.*, 2003, 2004; McGahan and Porter, 1997; Roquebert *et al.*, 1996; Rumelt, 1991), as they have attempted to examine transient industry effects (e.g. Hawawini *et al.*, 2003, 2004; Rumelt, 1991; Roquebert *et al.*, 1996). We therefore include year and the interaction of year and industry as independent variables in our models in order to observe the effect of macroeconomic fluctuations in firm activity and transient industry effects, respectively.

3. Method

3.1 Data and sample

The company industry classification, diversification degree and financial performance data were obtained from the Worldscope database. CSR data were extracted from the KLD (Kinder, Lydenberg and Domini) database. KLD is a reliable source for CSR measures and has been widely used by previous researchers (see Orlitzky *et al.*, 2003; Margolis *et al.*, 2007), and the database is in many respects the best instrument currently available for measuring the CSR of US firms (Márquez and Fombrun, 2005). Its methodology rates companies in a range of dimensions that reflect how well they cater for the community, corporate governance, diversity (to proxy for minorities), the natural environment, product quality (to proxy for customers), human rights and whether their operations are related to alcohol, tobacco, gambling, firearms, nuclear

power, military contracting and others. We believe that the KLD measure is more suited to our analysis than any expenditure measure of social responsibility, since Mauri and Michaels (1998) report that their results suggest that firm-level proxies like R&D and advertising expenditures capture broad classes of resources, not idiosyncratic firm resources or resource development processes, whereas the KLD measure of social responsibility is the result of firms' resources (financial or not) and capabilities.

The KLD data are available only at company level. There is no information on social performance at business level. Our sample therefore proceeds along the lines of Hawawini *et al.* (2003, 2004), who used a database that did not provide business level data. The lack of specificity has consequences for our research. The firm effects in this study are likely to reflect both corporate- and business-level effects and we will not be able to distinguish between them. Our interest focuses particularly on the relative importance of industry vs. firm effects, and any corporate-level effects will add to the firm effect variable.

The sample compiled of US firms is unbalanced and covers the five-year period from 2003 to 2007, coinciding with a time of economic stability in the USA. They are non-diversified firms, classified into industries based on the SIC system at the three-digit level. The sample was screened in various ways. We excluded firms that did not contain a primary SIC designation, or were identified by SIC as "miscellaneous,' "not elsewhere classified," "non-classifiable establishments," and "government." The data were also screened to identify firms that were not reported to be active in the same industry classification over the data period available. We also discarded firms that did not have at least two years' observations or an industry classification that did not have at least ten firms/year observations. The final sample contains 2,200 observations for 495 firms across 19 industry classifications.

3.2 Measures

In this study, the main dependent variable CSR is a composite of six dimensions (corporate governance, community, minorities, employees, the natural environment, and customers), consistently reported between 2003 and 2007 and selected because they reflect corporate attention to primary stakeholders that exert considerable influence on corporate strategy (Prahalad and Hamel, 1994). For each dimension, strengths and concerns are measured to evaluate positive and negative aspects of corporate action toward stakeholders. KLD's dataset is designed as a binary system. For each strength or concern, a rating of 1 indicates the presence of that rating and 0 indicates its absence. Authors use different methodologies to apply the ratings to their specific research objectives. We added all the strengths and subtracted the concerns of each dimension to construct the six dimensions of CSR, and to construct the CSR proxy we converted each CSR dimension using the five-point Likert-type scale adopted by Hillman and Keim (2001), and then added the six dimensions. Thus, the six dimensions have the same influence on CSR proxy. This same CSR proxy has been used before by: Backhaus *et al.* (2002); Bouquet and Deustsch (2008); Choi and Wang (2009); Padgett and Galan (2010).

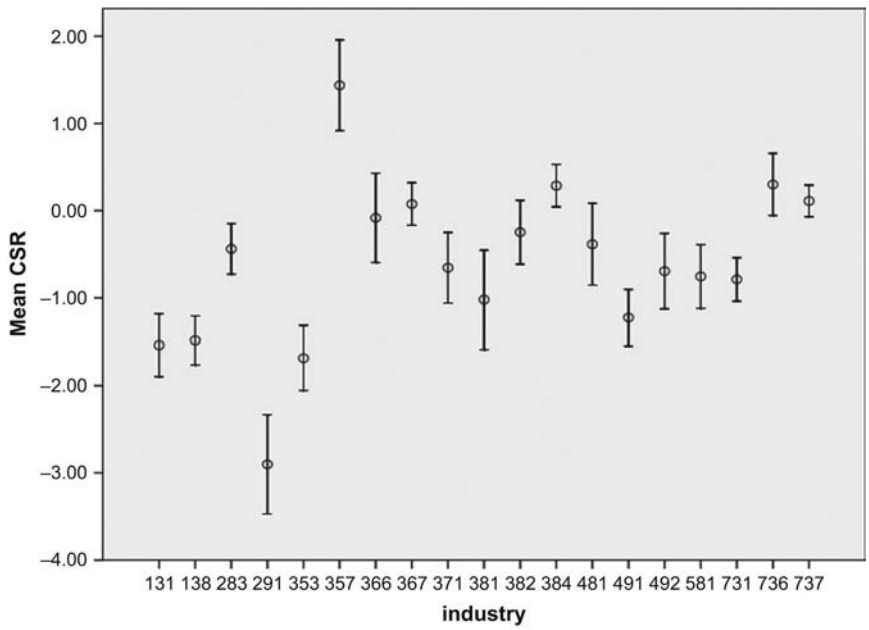
In order to compare the results of the CSR variation between industry and firm level, following the research by Mauri and Michaels (1998), we also test the sample using return on assets (ROA) calculated as net income divided by total assets. ROA yields the

most direct information about the results in the allocation of resources by a firm as it seeks competitive advantage (Hull and Rothenberg, 2008). Furthermore, as Beurden and Gössling, 2008 stated, accounting-based measures, such as ROA, reflect an organization's internal efficiency, which is influenced by the organization's social performance.

ROA has commonly been used as a financial performance measure in the strategy literature and, in particular, it has widely been used in the earnings decomposition studies (e.g. McGahan and Porter, 1997; Misangyi *et al.*, 2006; Rumelt, 1991; Schmalensee, 1985). Furthermore there is an extensive use of ROA as financial performance measure in CSR literature (e.g. Brammer and Pavelin, 2006; Bouquet and Deustsch, 2008; Johnson and Greening, 1999; Moura-Leite *et al.*, 2011; Padgett and Galan, 2010; Reverte, 2009; Turban and Greening, 1997). Before proceeding to the model specification, we should describe the final sample. Table I presents the mean CSR and ROA by industry for the period 2003-2007 and the number of firms in each industry is reported. Moreover, Figure 1 shows the difference in CSR (our main dependent variable) between industries in the sample. As we can see in Table I and Figure 1, CSR mean and within-industry homogeny differ by industry, thereby fortifying the relevance of the variance analysis. The descriptive statistics and correlation between the variables tested is shown in Table II. A significant correlation was observed between most of them, albeit with a relatively low coefficient on average, for example, (0.17) between Community and Environment. This result reinforces the suggestion that the level and the relative importance of firm and industry effects would be different across the different measures of social responsibility. It is also relevant to

SIC	Industry name	$N_{f(1)}$	CSR	ROA
131	Crude petroleum and natural gas	117	−1.5385	7.8476
138	Oil and gas field services	95	−1.4842	9.1364
283	Drugs	171	−0.4386	7.1895
291	Petroleum refining	50	−2.9020	10.5398
353	Construction, mining, and materials handling	54	−1.6852	8.0021
357	Computer and office equipment	87	1.4368	6.7704
366	Communications equipment	73	−0.0822	5.3653
367	Electronic components and accessories	277	0.0758	5.9513
371	Motor vehicles and motor vehicle equipment	58	−0.6552	8.3596
381	Search, detection, navigation, guidance, aeronautical, and nautical systems, instruments, and equipment	50	−1.0200	8.0584
382	Laboratory apparatus and analytical, optical, measuring, and controlling instruments	101	−0.2475	5.9062
384	Surgical, medical, and dental instruments and supplies	157	0.2866	8.4980
481	Telephone communications	57	−0.3860	6.6457
491	Electric services	160	−1.2250	4.0153
492	Gas production and distribution	98	−0.6939	4.6018
581	Eating and drinking places	114	−0.7544	8.3919
731	Advertising	52	0.1111	7.0277
736	Personnel supply services	50	−0.7885	6.3035
737	Computer programming, data processing, and other computer	378	0.3000	4.7092

Table I.
Mean CSR and ROA by industry for the period 2003-2007



Notes: SIC 3-digit-code reference on Table I. 95% confidence interval for means

Figure 1.
Bar graph of mean CSR by industry

	Mean	SD	1	2	3	4	5	6	7
CSR	−0.42	2.03							
Community	0.07	0.56	0.4246[a]						
Governance	−0.36	0.75	0.3017[a]	−0.0886[a]					
Minority	0.48	1.41	0.5386[a]	0.2301[a]	−0.1032[a]				
Employee	−0.11	0.92	0.6065[a]	0.1806[a]	−0.0886[a]	0.2301 [a]			
Environment	−0.17	0.91	0.2438[a]	0.1722[a]	0.0607[a]	0.0558[a]	0.1644[a]		
Consumer	−0.20	0.69	0.2438[a]	−0.1059[a]	0.0966[a]	0.0966[a]	0.0619[a]	0.1821[a]	
ROA	6.86	6.14	0.0692[a]	0.0140	−0.0045	0.0202	0.1043[a]	0.0204	0.0450[b]

Notes: [a] and [b] indicate that the correlation coefficient is significantly different from zero at a 99 and 95 per cent level of confidence, respectively

Table II.
Descriptive statistics and correlation matrix

study the CSR proxy, since the sum of each CSR dimension reflects the role of firms' social actions and allow us to understand the impact that industry-level has on this strategic asset.

3.3 Model specification

The primary goal of this study is to determine the relative importance of industry-level, firm-level, and year-level factors on corporate social responsibility in US firms. In order to do so, we employ a variance decomposition methodology. The methodology estimates the proportions explained by each independent variable in the variation of

the dependent variable. Our model is based on the following descriptive model, which is similar to that of Schmalensee (1985) and Rumelt (1991), but the dependent variable is corporate social responsibility instead of financial measure:

$$rij\,t = \mu\ldots + ai + \beta j + \gamma t + (a\gamma)i\,t + \varepsilon ij\,t \quad (1)$$

In this equation, the dependent variable, *rijt*, is corporate social responsibility, where $\mu\ldots$ is a constant equal to the overall mean (the three dots indicate that it is an average over the *i*, *j*, and *t* index); αi is a random industry effect where $i = 1\ldots r$ denotes any one industry as *i*; βj is a random firm effect where $j = 1\ldots ni$ denotes any one firm as *j*; ni is the number of firms within industry *I,* where *i* denotes any one industry as *i*; γt is a random year effect where *t* denotes any one year as *t*; $(\alpha\gamma)it$ is a random industry-year interaction effect; and $\varepsilon ij\ t$ is a random error term.

The main effects (αi, βj, and γt) and the interaction effect $(\alpha\gamma)it$ follow a normal random distribution with mean zero and variance σ^2_{α}, σ^2_{β}, σ^2_{γ}, and $\sigma^2_{\alpha\gamma}$, i.e. $\varepsilon(0, \sigma^2)$. The model specifies five sources of variation in corporate social responsibility: stable and transient industry factors, stable firm effects, the effects of yearly macroeconomic fluctuations, and random error. Firm effects include both corporate and business unit effects and reflect the influence of firm specific factors such as heterogeneity among firms in organizational culture, managerial skills, tangible and intangible assets. Stable industry effects reflect the influence of structural characteristics of industries on the social responsibility of firms, while the transient component of industry effects measures the sensitivity of corporate social responsibility to the impact of business cycles on the industry. The impact of factors with broader social or economic significance is captured by the year effect.

Past studies use various forms of variance decomposition methods. Early studies in the earnings variance decomposition literature employed mostly nested ANOVA techniques that consider the effects to be fixed (e.g. McGahan and Porter, 1997; Rumelt, 1991), and variance components analysis (VCA) (e.g. Hawawini *et al.*, 2003, 2004; Mauri and Michaels, 1998; Roquebert *et al.*, 1996). The variance component models are a special type of ANOVA model: the random effects ANOVA in which the independent variables are assumed to be random in nature (see Neter *et al.*, 1996: Chapter 24). Thus, following the studies that have sought to VCA, the equation for the estimation of variance components is developed based on the descriptive statistical model of equation 1 by decomposing the total variance in the dependent variable (corporate social responsibility) into its components as follows:

$$\sigma^2_r = \sigma^2_a + \sigma^2_{\beta} + \sigma^2_{a\gamma} + \sigma^2_{\varepsilon} \quad (2)$$

The dependent variable *rij t* in the previous model has constant variance and is normally distributed because they are linear combinations of independent normal random variables. The variance components estimation is particularly suited to studies such as the present one since it does not require a dataset covering the whole population, while at the same time allowing the results to be generalized. This is useful since it is impossible to construct a dataset that covers all industries and all firms in each industry.

We use the maximum likelihood option, which is the method recommended by Searle *et al.* (1992), and the VARCOMP procedure to estimate the different variance components

(Hawawini *et al.*, 2003, 2004, Roquebert *et al.*, 1996). When maximum likelihood estimation techniques are used, standard linear model significance testing techniques may not be applicable. ANOVA techniques such as decomposing sums of squares and testing the significance of effects by taking ratios of mean squares are appropriate for linear methods of estimation, but are not generally appropriate for quadratic methods. When ANOVA methods are used for estimation, standard significance testing techniques can be employed, with the caveat that any confusion between random effects must be taken into account. However, asymptotic tests of significance of maximum likelihood variance component estimates can be constructed for the parameter estimates from the asymptotic covariance matrix. The square roots of the diagonal elements of the covariance matrix are standard errors of the parameter estimates, which can be used to create asymptotically valid confidence limits on the parameters. In other words, we can estimate the significance levels of the resulting *t*-values. Following Roquebert *et al.*, 1996, we argue that the magnitude of the parameter, expressed as a percentage of the total variance explained, can be used as an indicator of the likelihood that the underlying value of the parameter is nonzero. This means that, the greater the parameter, the more likely the basic assumption will be fulfilled. Here the main indicator that should be taken into consideration for analysis is the percentage of the total variance explained. The use of these standard errors for testing the hypothesis where the parameter equals zero is not valid for hypothesis testing.

Results

Table III shows the results for CSR and ROA, including the parameter estimates for the various effects and the percentage of total variance for each parameter presented. Furthermore, Table IV shows only the parameter estimates for the various effects on behalf of the six dimensions individually, and Table V the percentage of total variance each parameter presented. The value of the diagonal of the asymptotic covariance matrix and the estimated significance level of all measures are shown in the Appendix (see Tables AI-AIII).

As can be seen from Table III, CSR and ROA are influenced mainly by firm-level factors. Nonetheless, CSR recorded a percentage of variance estimates in industry-levels that was considerably higher than ROA. Year and industry-year effects are low on CSR, while on ROA the industry-year effects explain a little more (4 per cent). The result for ROA variation in firms and industry levels is similar to those presented by Mauri and Michaels (1998), though our sample was chosen very differently. Using a five-year period, Mauri and Michaels (1998) found that 36.9 per cent of variation was derived from firm factors and 6.2 per cent from industry factors, and using a 15-year period that 25.4 per cent of variation was derived from

Variance component	CSR Variance estimate	(%)	ROA Variance estimate	(%)
Firm effects	2.480744	58.5	11.255707	29.1
Industry effects	0.585021	14.0	1.384624	4.0
Year effects	0.012810	0.3	0.741165	1.9
Industry-year effects	0.054898	1.2	1.424484	4.0
Error	1.101183	26.0	23.373919	61.0

Table III. Absolute values of variance and relative proportions contributed by independent variables for years 2003-2007 across CSR and ROA

Variance component	Variance estimate					
	Governance	Community	Consumer	Environment	Employee	Minority
Firm effects	0.276982641	0.204372381	0.294814029	0.304540847	0.47320072	1.489231497
Industry effects	0.009776121	0.014545257	0.065240712	0.498917652	0.046310277	0.226505307
Year effects	0.013328914	0.000207481	0.000575382	0.000000000 *	0.000000000 *	0.000000000 *
Industry-year effects	0.001538872	0.003100609	0.0016477	0.025379426	0.012428523	0.006537227
Error	0.268017058	0.084607629	0.091682884	0.159155235	0.294401129	0.302702311

Note: *The estimate was not significant

Table IV.
Absolute values of variance contributed by independent variables for years 2003-2007 across the six dimensions of CSR

firm factors and 5.8 per cent from industry factors. Although the core strategies studied by Mauri and Michaels (1998) – R&D intensity (five-year period; 62.2 per cent by industry) and advertising intensity (five-year period; 69.3 per cent by industry) – showed more influence of industry factors than our CSR variance component (14 per cent), we did not use an expenditures measure like Mauri and Michaels (1998) did. These results show that in our sample, firm factors explain most of the variation in CSR across firms, even though the industry explains much more in CSR if compared with ROA variation.

To analyze the difference in variation between the six dimensions of CSR, in Table V we can see that firm effects dominate most of the explained variation, except for the Environment proxy, in which the industry effects explain 50.5 per cent of the variance, while in the firm effects it explains 30.8 per cent. In addition, industry factors explain as follows: 14.4 per cent for Consumer; 11.2 per cent for Minority; 5.6 per cent for Employee; 5.0 per cent for Community; and 2.0 per cent for Governance. We can thus observe a clear difference in explained variation between the dimensions of CSR. Year factors contribute little for explaining the dimension of CSR, while it is not significant in the Environment, Employee and Minority dimensions. The industry-year interaction effect is also small; it is higher for Environment (2.6 per cent).

5. Discussion and conclusion

This study has revisited the relative importance of industry and firm level effects on CSR in several ways. First, we tested for the effects using a composite of the six dimensions of CSR and found large firm-level effects on CSR (58 per cent of the variance in the composite measure). This result attests to the fact that firms retain considerable self-determinism regarding their CSR trajectories. It also supports the resource-based view that social performance is determined by the internal characteristics of firms, since CSR is a strategic asset that presents barriers to imitation. Although consistent with the slack resources perceived, under causal ambiguity, CSR should assume the same variation behavior as financial performance, which in our study is measured as ROA. The ROA variance, like the CSR variance in our study, is larger on firm level than on industry level.

Despite the reduced number of industries in our sample and the classification based on the SIC system at three-digit level, which undoubtedly results in a conservative estimate of the importance of industry-effects (Chang and Singh, 2000), we find a relatively large industry component in CSR decomposition, if compared to ROA

	Variance estimate					
Variance component	Governance (%)	Community (%)	Consumer (%)	Environment (%)	Employee (%)	Minority (%)
Firm effects	48.4	66.6	64.9	30.8	57.2	73.6
Industry effects	2.0	5.0	14.4	50.5	5.6	11.2
Year effects	2.3	0.0	0.1	0.0*	0.0*	0.0*
Industry-year effects	0.2	1.0	0.3	2.6	1.6	0.3
Error	47.1	27.4	20.3	16.1	35.6	14.9

Note: *The estimate was not significant

Table V. Relative proportions of variance contributed by independent variables for years 2003-2007 across the six dimensions of CSR

results. Even though we expected a larger industry-level effect, the results support our core proposition that CSR represents a shared strategic asset, which is consistent with the industry organization view (Rumelt, 1991), whereby common market structure is the explanation for strategic choice, as managers pursuing the Key Success Factors approach adopt strategic benchmarking aimed at decreasing competitive gaps. They are also consistent with the institutional theory perspective (DiMaggio and Powell, 1983) that firms competing in the same industry tend to develop homogeneous competitive strategies, as managers try to reduce the strategic gaps with relevant competitors to gain legitimacy in the eyes of primary stakeholders.

The results for firm and industry effect, considered together, imply that CSR researchers need to examine both levels simultaneously, as we find that CSR can be influenced by both firm-level and industry-level factors. Furthermore, research on CSR issues should not adopt the assumption that it is driven by firm-specific factors only, thus also having to analyze industry factors (McWilliams and Siegel, 2000). For example, the exploration of links between CSR and firms' reputation and/or legitimacy should take the firms' industry into account, as this linkage might be more or less profound in certain industries than in others. One interesting question that this raises, however, is "which industry characteristics influence the improvement of CSR?".

Furthermore, the considerable industry-effect on CSR variation of our results opens the door to an examination of how individual firms may differentiate and exploit their social performance and compete at industry-level, since in industries with strong positive CSR, individual firms can free ride on the CSR efforts of dominant firms, and at the same time firms with weak CSR can damage the industry-level CSR. Another factor that could help to better answer the last question is to measure CSR in a different way; instead of using a real measure of CSR (KLD database), a perceived measure that is based on reputation indices could be used. Liston-Heyes and Ceton (2009) found that these two indices measure different phenomena. Furthermore, Brammer and Pavelin (2006) found that CSR has varying reputation impacts and that these impacts are contingent on each industry. Since the reputation of a firm is largely socially constructed (Hoffman and Ocasio, 2001) and because industry is highly visible, the actions in its industry may weigh heavily on the attributions stakeholders make regarding a firm's corporate social performance. King *et al.* (2002) refer to this phenomenon as the "reputation commons problem".

The paper also finds that each strategic CSR dimension has a different variation between industry and firm levels. However, all dimensions present major variations at firm level, except for the environment dimension, which records a larger industry effect. This reaffirms the institutional theory that firms' legitimacy stems from adherence to social norms and expectations (DiMaggio and Powell, 1983). This dimension has more public visibility, media attention and scrutiny from government, which can help to explain why Environment was the first social responsibility dimension to be addressed by firms.

In addition to the institutional theory approach, other theories can be used to assist managers to make decisions in an ethical context. Donaldson (1982) considered the business and society relationship from the social contract tradition, assuming that there is a sort of implicit social contract between business and society. Donaldson and Dunfee (1994) proposed an Integrative Social Contract Theory in order to take into account the context and also to integrate empirical and normative aspects of

management. They differentiate between macrosocial contracts and microsocial contracts. The macrosocial contract appeals to all rational contractors, and provides rules for any social agreement (these rules are called the "hyper-norms" and should take precedence over other contracts). The microsocial contracts appeal to members of numerous localized communities, show explicit or implicit agreements that are required within an identified community, and have to agree with the "hyper-norms", whatever these may be: industry, companies or economic systems.

Managers have to identify the level of each business's social contracts with each identified community to understand its impact on CSR dimensions. Furthermore, the social contract theory gives primary emphasis to expressed or implied understandings among stakeholders as to proper distributions and uses of property (Donaldson and Preston, 1995). In the same line, Mitchell *et al.* (1997) affirm that it is necessary for managers to identify the characteristics and perceptions of each stakeholder and their relationship with the firm, in order to define how to comply with their expectations, since "stakeholder attributes are socially constructed, not objective, reality" (p. 868).

In addition, the stakeholder theory should be incorporated to support the insight about the difference in variability between firm and industry levels of the strategic CSR dimensions observed on our results. The stakeholder theory implies that it can be beneficial for the firm to engage in certain corporate social responsibility activities that non-financial stakeholders perceive to be important, as without such activities these stakeholders might withdraw their support from the firm (Freeman, 1984; Mitchell *et al.*, 1997). Thus a strategic CSR dimension that makes reference to a stakeholder type can be relevant to a specific firm because of its relationship characteristics or relevance to every firm acting in a given industry, since the relationship characteristics are shared by most of the firms in the same industry.

Our results have many practical implications. The implication for firm management is clear from the statements that have been discussed earlier. While industry factors do influence the context in which social responsibility choices are made, such influences often do not explain the firm's social performance. The fact that firms operate in a particular industry does not automatically imply that they have a greater or lesser social responsibility, as there are internal and other external factors that also influence social responsibility. Thus, CSR should be a good strategy of differentiation for some firms, with the exception of the mature CSR dimension, Environment, which is explained largely by industry components. Therefore, for non-governmental organizations and governmental and regulatory institutions the results of our study suggest that those interested in influencing CSR should note the amount of variance explained by industry effects. In other words, if there are stable differences between industries with regard to CSR, there are opportunities to influence CSR choices.

The findings of this study, however, are subject to limitations. First, our sample is composed only of American firms and future research on the variation in CSR should take into account the firms' geographic location, since country is a key factor in corporate social responsibility intensity (Doh and Guay, 2006). Thus, a comparative study could help understand the impact of a country's characteristics on its firms' social responsibility. Furthermore, the sample should take into account a longer period to improve the analysis of time impact on CSR as well as to observe the difference in the CSR decomposition between stable, growing and recessing economic periods, since CSR activities are a dynamic concern, and their diversity in variance decomposition

should reveal industry and firm-level behavior in each scenario. Therefore, a comparative analysis between countries and period could give a better understanding of the influence that external factors, such as politics, economy and society, have on CSR intensity.

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Appendix

Table AI.
Value of the diagonal of the asymptotic covariance matrix and the estimated significance level of CSR and ROA

	CSR		ROA	
Variance component	Diagonal	Sig. level	Diagonal	Sig. level
Firm effects	0.03161230	13.9525	1.25761093	10.0369
Industry effects	0.05689921	2.4525	0.68413223	1.6740
Year effects	0.00017830	0.9593	0.35876819	1.2373
Industry-year effects	0.00034365	2.9613	0.20350039	3.1577
Error	0.00148320	28.5929	0.71932592	27.5593

Table AII.
Value of the diagonal of the asymptotic covariance matrix of each dimension of CSR

	Estimate variance (diagonal)					
Variance component	Governance	Community	Consumer	Environment	Employee	Minority
Firm effects	0.00048662	0.00021147	0.00042110	0.00049313	0.00123942	0.010235208
Industry effects	0.00006602	0.00006818	0.00069792	0.02868425	0.00058060	0.009712391
Year effects	0.00008818	0.00000019	0.00000041	0.00000000	0.00000000	0.000000000
Industry-year effects	0.00000442	0.00000147	0.00000094	0.00003119	0.00001921	0.000009423
Error	0.00008716	0.00000875	0.00001024	0.00003106	0.00010590	0.000111691

Table AIII.
The estimated significance level of each dimension of CSR

	Significance level					
Variance component	Governance	Community	Consumer	Environment	Employee	Minority
Firm effects	12.5561	14.0540	14.3666	13.7140	13.4411	14.7202
Industry effects	1.2031	1.7615	2.4695	2.9458	1.9219	2.2983
Year effects	1.41942	0.4777	0.8959	–	–	–
Industry-year effects	0.73165	2.5612	1.6970	4.5443	2.8359	1.9762
Error	28.7086	28.6104	28.6470	28.5578	28.6084	28.6421

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