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Revisiting the Impact of Social Performance on Financial Performance from a Global Perspective

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Abstract

There is a continuing debate in the Corporate Social Responsibility literature as to whether and how firms' social performance (SP) affects their financial performance (FP). Theoretical arguments as well as empirical measurements point to somewhat contradictory results. Most of the empirical work is predicated on rigid conventional models, expressing constant or strictly monotonic marginal returns in the assumed SP-FP relationship. This paper revisits this relationship from a global perspective, relaxing the range of admissible models. A non-monotonic framework incorporating contextual factors is proposed. Five models are tested over a common 17 years horizon. They yield consistent significant estimates and concur on the existence of such a relationship although the latter has evolved over time. They support the notion of a complex SP-FP impact.

Keywords: social performance, financial performance, contingency factors, industrial context, strategy, valuation

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1 INTRODUCTION

While gaining increasing attention, the concept of Corporate Social Responsibility (CSR) has evolved over recent decades, from "surpassing legal requirements" (Bowen, 1953) to "heeding demands from main stakeholders" (Freeman, 1984; Clarkson, 1995). Over the years, a number of disasters related to the environment (e.g. Exxon Valdez 1989, BP 2010), corporate governance (Enron 2001), social accountability (Rana Plaza 2013) have contributed to increased public awareness of CSR issues. Civil society campaigns against particular practices have developed into organized networks. The years 2000 mark a turning point where social responsibility became more systematically assessed and integrated into firms' valuations. This is exemplified by the development of specific social and environmental indices such as KLD, by the inclusion of social and environmental dimensions into financial analyses and financial information databases, and by the creation of a number of CSR-oriented mutual funds and pension funds.

The impact of social conduct on the firm's strategic posture has long been debated. Supporting organizational theories of the firm have significantly evolved, from a neo-classical outlook (Friedman, 1970) to more descriptive frameworks such as stakeholder theory (e.g. Freeman 1984), and financial strategy or specific managerial theories (Merton, 1987; McGuire et al., 1988; Waddock and Graves, 1997).

In parallel to this evolving theoretical perspective, numerous empirical studies have examined the impact of SP on FP. The results of these studies are largely contradictory, however. Some (e.g. Kurtz and DiBartolomeo, 1996) conclude to the inexistence of a SP-FP relationship. Others do detect a significant positive (Wang and Choi, 2010) or negative (Garcia-Castro et al., 2010) relationship in specific circumstances. We hold that these inconsistencies may in large part be attributable to methodological issues. Among these are (i) rigid, simplistic forms for the assumed relationship, (ii) restricted time frames, and (iii) ad hoc associations with specific background variables hampering meaningful comparisons. Thus we deem it important for further empirical work to refine model specifications, to qualify the simultaneous influences of intervening variables, and to test the robustness of results on a longer time frame.

This paper revisits empirically the SP-FP relationship from a global perspective, based on a large sample and identical SP and FP measures over 17 years, incorporating contextual factors and lending a particular attention to the form of this relationship. Our main conclusions are that (i) it has a non-monotonic form, (ii) contextual factors seem to intervene significantly, with a synergistic effect (iii) such a relationship does seem to exist although it has evolved over time.

2 LITERATURE REVIEW

The SP-FP relationship can be analyzed from the standpoint of industrial organization, encompassing economic and managerial theories of the firm and of its institutional (e.g. markets) environment (Table 1). In the neo-classical framework, the profit-maximising firm merely balances costs and benefits of its SP posture. The latter thus does not deserve any special strategic status.

By contrast, stakeholder theory (e.g. Freeman, 1984) views the firm in symbiotic exchange (an implicit, open contracting mode) with multiple parts of its environment, in a more or less direct way. Customers, suppliers, employees, shareholders, neighborhood communities exert direct influences on the firm's options. More mediated influences may originate in the evolving institutional environment (laws and norms, regulators, social groups, information and communication structures…). Stakeholder theory thus emphasises the variety of actors and of points of view that must be dealt with. Prominent examples of evolving multiple stakeholder demands are found in the mining industry.

Some organisational theories focus on the firm's financial strategy. The risk management perspective views SP as its systematic risk (Boutin-Dufresne and Savaria, 2004; Lee and Faff, 2009), as well as a means of preserving reputation and goodwill (Godfrey, 2005; Godfrey et al., 2009). In a context of imperfect information, attention to CSR is viewed as favouring transparency and expanding the investor base (Merton, 1987; Barnea et al., 2005; Mackey et al., 2007).

Finally, less testable theories focus on managerial discretion or the lack thereof. For instance, slack resources theory suggests that profitable firms can improve their SP through CSR investments, whereas others cannot (McGuire et al., 1988; Waddock and Graves, 1997). The theory of managerial opportunism, in a vein similar to agency theory, suggests that managers extract personal benefits from CSR investments by enhancing their own managerial reputation at the expense of shareholders' interests (Barnea and Rubin, 2010; Cespa and Cestone, 2007).

Although none of these theories leads to a direct prediction as to a possible SP-FP relationship, they rest on incompatible premises.

Table 1: Organizational Theories

Theory	Rationale
Neo-classical (Friedman, 1970)	SP is a cost to be compensated
Stakeholder theory (Freeman, 1984)	The firm is embedded in a transactional network with multiple stakeholders such as customers, investors, regulators, etc.
Risk management (Godfrey, 2005)	SP serves as an insurance mechanism to preserve rather than generate FP
Reputation and Investor base (Merton, 1987)	Firm expands its investor base from conventional to more idiosyncratic.
Slack resources theory (McGuire et al., 1988)	SP results from organizational slack, e.g. excess resources
Managerial opportunism	SP as private benefits that managers extract at the expense of shareholders

Source: Bouslah et al., 2013

Similarly, a large number of empirical studies have taken place over the recent years, yielding a wide variety of results, which may in part be due to several methodological choices (Tebini, 2012). Two main streams must be distinguished: one is concerned with the impact of SP on companies' returns, the other with the impact on companies' risk.

The first stream is mostly concerned with testing a linear SP-FP relationship. The results are not univocally conclusive. This work is summarized in Table 2.

Table 2: Empirical Tests of the Relationship between SP and Return on Assets

Form of relation	Sign	Authors
FP = *f*(SP) linear	+	Bragdon & Marlin (1972); Belkaoui (1976); Shane & Spicer (1983); McGuire et al. (1988); **Luck & Pilotte (1993)** *; Hart & Ahuja (1996); **Griffin** & **Mahon (1997); Waddock et Graves (1997)**; Vershoor (1999)**; Berman et al. (1999); Graves** & **Waddock (2000);** Jones & Murrell (2001); **Ruf et *al.*, (2001);** Simpson & Kohers (2002); **Verschoor** & **Murphy (2002); Tsoutsoura (2004); Goukasian** & **Whitney (2007) ; Siegel** & **Vitaliano (2007); Garcia-Castro et al. (2008);** Lankoski (2008); **Choi** & **Wang (2009); Hull** & **Rothenberg (2008); Callan** & **Thomas (2009);** Choi et al. (2010); **Wang** & **Choi (2010);** Kapoor & Sandhou (2010); Mishra & Suar (2010)
FP = *f*(SP) linear	–	Bradgon et Marlin (1972); Vance (1975); Langbein & Posner (1980) ; Freedman & Jaggi (1982); Ingram & Frazier (1983); Aupperle et al. (1985); Freedman & Jaggi (1992); Meznar et al. (1994); Wright & Ferris (1997); Cordeiro & Sarkis (1997); Ogden & Watson (1999); Knoll (2002); Paten (2002); Wagner et al. (2003); Brammer et al. (2005); Brammer et al. (2006); Hill et al. (2007); Lopez et al. (2007)**; Garcia-Castro et al. (2008);** Lee et al. (2009); **Garcia-Castro et al. (2010)** ; Cardebat et Sirven (2010)
FP = *f*(SP) linear	Neutral	Alexander & Buchholz (1978); Abbott & Monsen (1979); Chen & Metcalf (1980); Freedman & Jaggi (1986); Mahoney & Shanley (1990); Greening (1995); **Kurtz** & **DiBartolomeo (1996); Guerard (1997); Berman et al. (1999); Graves** & **Waddock (1999); McWilliams** & **Siegel (2000); Waddock et al. (2000)**; D'arcimoles & Trebucq (2003); Seifert et al. (2004); Mill (2006); Murray et al. (2006); Renneboog et al. (2008); Kapoor & Sandhou (2010); **Surroca et al. (2010); Garcia-Castro et al. (2010); Choi et al. (2010);** Lee et al. (2010)
SP = *f*(FP) linear	+	McGuire et al. (1988); Corttrill (1990) ; Dooley & Lerner (1994); Preston & OBannon (1997); Lerner & Fryxell (1988); Cowen et al. (1987); Kraft & Hage (1990); Robert (1992); **Waddock** & **Graves (1997);** Stanwick & Stanwick (1998); Verschoor (1998); Adamas & Hardwick (1998); **Johnson** & **Greening (1999);** Buchholz et *al.* (1999); Seifert et al. (2004); Elsayed (2006); **Bird et al. (2006); Nelling** & **Webb (2008)**
SP = *f*(FP) linear	–	Lerner & Fryxell (1988); McGuire et al. (1990)**; Johnson** & **Greening (1999)**
SP = *f*(FP) linear	Neutral	Cowen et al. (1987); Lerner & Fryxell (1988); McGuire et al. (1990); Patten (1991); **Johnson** & **Greening (1999)**
SP = *f*(FP) convex		Barnett & Salomon (2006) **; Bouquet** & **Deutsch (2007);** Brammer & Millington (2008); **Sun-Young** & **Lee (2009);**
SP = *f*(FP) concave		Bowman & Haire (1975) Sturdivant & Ginter (1977); Stanwick & Stanwick (2000); Lankoski (2000); Moore (2001); Schaltegger & Synnestvedt (2001); Wagner (2005); Wang et al. (2008); Elsayed & Paton (2009);

Note. Authors in bold use a measure based on the KLD database. Source : Tebini, 2012

More recently, a second stream aims at assessing the impact of SP on the firm's risk. The latter is being recognised by analysts as "extra-financial risk", as it may affect the firm's reputational capital (Fombrun *et al.*, 2000) or its moral capital and goodwill (Godfrey *et al.*, 2009).

Table 3: Empirical Tests of the Impact of SP on Risk

Authors	Context	SP measure	Risk Measure	Results(sign)
Boutin-Dufresne & Savaria (2004)	Canada	Canadian Social Investment Database (CSID)	Idiosyncratic risk	(–)
Lee & Faff (2009)	International	Dow Jones Sustain-ability Index (DJSI)	Idiosyncratic risk	(–)
Luo & Bhattacharya (2009)	US	*Fortune*'s Most Admired Companies	Idiosyncratic risk (systematic risk)	(–)
Salama, Anderson & Toms (2009)	UK	Community and environment	Systematic risk	(–)
Oikonomou, Brooks & Pavelin (2010)	US (S&P500 firms)	MSCI ESG STATS (KLD)	Systematic risk	(–)
Goss (2011)	U.S. (all KLD firms)	MSCI ESG STATS (KLD)	Idiosyncratic risk	(–)
Bouslah *et al.* (2013)	U.S. (all KLD firms)	All KLD dimensions	Idiosyncratic risk (+total+systematic)	Depends on dimension

Source: Bouslah et al., 2013

In summary, both theoretical and empirical literatures indicate divergent conclusions as to the existence and form of a SP-FP impact. In addition, the empirical literature points to several company characteristics that may affect this relationship.

Some authors have introduced size (Waddock and Graves, 1997; McWilliams and Siegel, 2000; Hillman and Keim, 2001), risk (Pava and Krausz, 1996; Hillman and Keim, 2001; Orlitzky and Benjamin, 2001; Boutin-Dufresne and Savaria, 2004; Luo and Bhattacharya, 2009), R&D and advertising expenditures (Hart and Ahuja, 1996; Konar and Cohen, 2001; Wagner, 2003; Husted and Allen 2007a, b; Porter and Kramer, 2006; Padgett and Galan, 2010), and industrial sector as control variables. However, the effect of these factors may be more complex. Orlitsky et al., (2003) for example maintain that they should also be introduced as moderating variables. Indeed, they state that the high residual variance obtained as a result of their meta-analysis is due to the omission of numerous moderating variables that may indirectly influence the SP-FP relationship. The specification of the relationship must therefore include these interactions, wherein their impact of SP upon FP, via indirect transmission channels, can be increased or decreased. This change of models is a hallmark of recent literature that has empirically demonstrated that company characteristics such as R&D spending (Hull and Rothenberg, 2008; Wang and Choi, 2013), life-cycle (Elsayed and Paton, 2009) and size (Ioannou and Serafeim, 2010) have an effective moderating effect.

Several authors suggest that size affects FP just as much as SP (Ullmann, 1985; Graves and Waddock, 1994; 1999; Russo and Fouts, 1997; Johnson and Greening, 1999; Simpson and Kohers, 2002; Ruf et al., 2001; Wu, 2006; Van Beurden and Gossling, 2008). The studies that examine the SP-FP relationship equally attest to the importance of size as a factor affecting SP (Orlitzky, 2001; Wu, 2006; Amato and Amato, 2007; Van Beurden and Gossling, 2008; Ioannou and Serafeim, 2010). The most common assertion is that size can have a positive effect on SP. Large companies attracting more public attention and facing more pressure from stakeholders have less scope for eluding social responsibilities (Ullmann, 1985; Burke et al., 1986; Adams and Hardwick, 1998; Amato and Amato, 2007; Rojas et al., 2009). Additionally, large companies have greater financial resources, allowing them to respond to higher stakeholder demands (Ullmann, 1985; Brammer and Millington, 2006). The size effect is usually captured via control variables (Waddock and Graves, 1997; McWilliams and Siegel, 2000; Hillman and Keim, 2001). The introduction of size as a control variable allows its possible effect on FP to be measured, rather than on the intensity of the relationship. Nevertheless, SP level may be conditioned by size, as has been suggested in recent studies (Van Beurden and Gossling, 2008; Ioannou and Serafeim, 2010). In this case, size would play the role of a moderating factor in the FP-SP relationship (Ioannou and Serafeim, 2010).

Systematic risk is another determining influence on FP. It has been introduced in most previous studies as a control variable. The two proxies used to assess risk are the company's systematic risk or «beta coefficient» (McGuire et al., 1988; Pava and Krausz, 1996; Hillman and Keim, 2001; McAlister et al., 2007; Luo and Bhattacharya, 2009) and its financial leverage (Waddock and Graves, 1997; Tsoutsoura, 2004; Choi and Wang, 2009; Kapoor and Sandhun, 2010). Other studies have empirically validated the influence of risk upon SP (McGuire et al., 1988; Waddock and Graves, 1997; Orlitzky and Benjamin, 2001). Indeed, according to Orlitzky

and Benjamin (2001), companies undertaking high-risk operations are incited to act in a responsible manner so as to reduce their level of risk in a pro-active way. Conversely, Zyglidopoulos (1999) has shown that companies faced with an elevated level of risk have fewer resources to devote to innovation and to CSR. SP level could thus be affected by the company's level of risk.

Other studies suggest that the FP-SP relationship is influenced by certain intangible company investments such as R&D and advertising (Hart and Ahuja, 1996; McWilliams and Siegel, 2000; Konar and Cohen, 2001; King and Lenox, 2002; Wagner, 2003; Husted and Allen 2007a, b; Porter and Kramer, 2006; Paton and Elsayed, 2005; Strike et al., 2006; Brammer and Millington, 2008; Callan and Thomas, 2009; Padgett and Galan, 2010; Surroca et al., 2010; Ioannou and Serafeim, 2010). The studies that examine the financial impact of SP have introduced these variables in order to control the effect of innovation on FP. They support the idea that the intensity level of R&D and advertising reinforces the company's capacity for innovation and improves the investor's assessment of the company (Cohen and Levinthal, 1989; Chauvin and Hirschey 1993; Gruca and Rego, 2005). Nevertheless, other studies have shown a correlation between these factors and SP (Berrone et al., 2007; Wang et al., 2008). Some papers have considered their moderating effect (Luo and Bhattacharya, 2006; Mackey et al., 2007; Bouquet and Deutsch, 2007; Siegel and Vitaliano, 2007; Hull and Rothenberg, 2008). It could thus be relevant to take into account the influence of investment in R&D or advertising on SP and FP.

It must be noted that many of the studies cited above are limited in scope as to factors being considered. The present research addresses three main issues: (1) what is the type of relationship between SP and FP? (2) How do contingency factors such as risk and R&D expenses moderate this link? (3) Has the nature of the relationship changed over time? These questions are formulated in the next section, wherein our research hypotheses are presented. Section 4 presents data, measures, and samples. Section 5 formulates estimation models, section 6 presents our findings. We then conclude in section 7.

3 RESEARCH HYPOTHESES

The literature offers several perspectives on the formalisation of the SP-FP relationship. Linear specifications – positive or negative – seem inappropriate given the complexity of the link. Tebini et al., (2014), distinguish two main streams in the literature. One, comprising Barnett and Salomon (2006), Bouquet and Deutsch (2008), Lankoski (2008), Brammer and Millington (2008), Elsayed and Paton (2009), underscores the limitations of linear models for representing a SP-FP relationship. The second stream (Moore, 2001; Marom, 2006; Callan and Thomas, 2009) questions the monotonicity hypothesis in this relationship.

This questioning of model specifications has led to the emergence of non-linear models, in particular of concave or convex forms (Lankoski, 2008; Wang et al., 2008; Elsayed and Paton, 2009; Sun-Young and Lee, 2009). Although such models are untenable outside a finite domain, they provide a stepping stone to a more global view, leading to the idea of a non-uniform relationship. A specification by stages, as suggested by Johnson (2003), allows the marginal impact of SP on FP to depend on SP intensity. To this effect, we propose to test the following hypothesis:

H1: The impact of SP on FP depends on SP levels. Under low SP, the marginal SP impact tends to be low (catching up is not much rewarded), whereas under high SP, it tends to be positive (continuous pro-activeness is recognized).

In modeling the FP-SP relationship, size has at times been considered a control variable (Waddock and Graves, 1997; McWilliams and Siegel, 2000; Hillman and Keim, 2001); or, along a suggestion by Orlitsky et al. (2003) treated as a genuine moderating variable (Ioannou and Serafeim, 2010; Van Beurden and Gossling, 2008). In addition to such considerations, other authors (Ullmann, 1985; Adams and Hardwick, 1998; Amato and Amato, 2007; Rojas et al., 2009) assert that an enterprise's large size in itself makes it more exposed to various stakeholders' demands and to militant shareholders' pressures, whereas others remind us that size has a positive effect on FP. In summary, as seen in the literature review, size affects FP, and its effect on the SP-FP relationship is somewhat controversial. Hence:

H2a: Company size has a moderating effect upon the financial impact of SP.

FP is negatively affected by risk. However, SP may also be dependent on risk. Introducing the effect of risk solely as a control variable implies that the effect of SP on FP is constant whatever the level of risk. Once again, conclusions from various studies on this question diverge. Whereas Waddock and Graves (1997) and Orlitzky and Benjamin, (2001) argue that the most risky firms should be more CSR responsive (in order to limit their overall risk), Zyglidopoulos (1999) finds that riskiest firms are unable to fund CSR projects. Therefore risk affects SP, and it becomes relevant to test its moderating effect:

H2b: Risk has a moderating effect on the financial impact of SP. The negative effect of risk is amplified when it is not compensated by active social involvement. A better SP may lead to a lower perceived risk which may enhance the firm' relationship with the government, investors and debtors and may reduce the cost of capital.

Some studies conclude that R&D and advertising reinforce the company's FP (Cohen and Levinthal, 1989; Gruca and Rego, 2005), while others have shown a correlation between these factors and SP (Berrone et al., 2007; Wang et al., 2008) and some other studies have considered their moderating effect (Luo and Bhattacharya, 2006; Hull and Rothenberg, 2008). It could thus be relevant to take into account the influence of investment in R&D or advertising on SP and FP. We therefore propose to test the following hypothesis:

H2c: Company spending on R&D, advertising and technical capital has a moderating effect on the financial impact of SP.

Evolving demands and collective organisation of consumers and responsible investors stakeholder (Rojas et al., 2009; By et al., 201) may explain divergent conclusions noted in several meta-analyses (Orlitzky and Benjamin, 2001). The SP-FP relationship thus depends on continuous developments in the domain of CSR, on the evolution of market preferences and on technological advances. It seems therefore necessary to distinguish between epochs of this relationship:

H3: The SP-FP relationship is not stable over time as it has evolved along historical stages of CSR recognition.

4 DATA AND SAMPLE SET

Two types of data are necessary: social and financial. Social data have been taken from the MSCI ESG STATS (known under the name KLD Research & Analytics Inc.) database. Financial data have come from the database of Research Insight Compustat, which offers a large database for analysis of the American market.

From 1991 to 2000, KLD has rated approximately 650 US firms, 2000 firms in 2002 and more than 3000 in 2003. The rated firms are mainly American companies, among which those present in the S&P500 reference index as well as the Russell3000. KLD is considered a reference in research matters in the domain of socially responsible investment (Margolis et al., 2007). Most studies on the subject of CSR use measurements derived from the KLD database (Waddock and Graves, 1997; Griffin and Mahon, 1997; McWilliams and Siegel, 2000; Hillman and Keim, 2001; Becchettil et al., 2007; Nelling and Webb, 2009; Callan and Thomas, 2009; Choi and Wang, 2009). To date, KLD is considered the largest and most complete source of information regarding CSR (Waddock, 2003; Mattingly and Berman, 2006; Harjoto and Jo, 2011). The KLD system allows American companies to be rated according to 13 SP dimensions. Qualitative issues make up seven dimensions that are related to key stakeholders, namely: (1) employees, (2) community, (3) diversity, (4) environment, (5) governance, (6) products and (7) human rights. Each of these dimensions is evaluated on two criteria, namely strengths and concerns. Strengths and concerns are both rated on binary scales, where "1" signifies "existing" and "0", "not applicable". The remaining six dimensions relate to controversial activities and constitute a series of exclusion criteria.

The KLD database effectively omits all criteria of financial evaluation. The KLD data-collection process and information criteria ensure that rated CSR strategies have actually been put in place (Ioannou and Serafeim, 2010).

After merging social data from KLD and financial data from Compustat, our final sample set is a non-balanced panel of 21172 company-year observations over the period 1991-2007.

5. ESTIMATING THE SP-FP RELATIONSHIP

5.1. Dependent variable: Financial Performance

The return on asset (ROA) measured by the ratio «Net income/ total asset» is used as a proxy for FP. This financial indicator is often used in the literature on the SP-FP relationship (McGuire et *al*., 1988; Waddock and Graves, 1997; Simpson and Kohers, 2002; Nelling and Webb, 2009; Mishra and Suar, 2010; Garcia-Castro et *al*., 2010) and given preference over measures derived from the stock market (Margolis and Walsh, 2003; Orlitzky et *al*., 2003).

5.2. Independent variables: Social Performance

There is no consensus to-date about a definite measure of social performance. A majority of references use various *proxies* based on aggregates of KLD indices or variants thereof (Waddock and Graves, 1997; Hillman and Keim, 2001; Becchetti et *al*., 2007; Callan and Thomas, 2009; Choi and Wang, 2009).

The measurement we choose for the exogenous SP variable is based on simple averages of KLD strengths and of KLD concerns. Our choice to assign equal weights to KLD strengths (concerns) is consistent with the theoretical literature on stakeholder management and follows most empirical reference studies (Sharfman, 1996; Johnson and Greening, 1999; Hillman and Keim, 2001; Siegel and Vitaliano, 2007; Callan and Thomas, 2009; Wang and Choi, 2010; Surroca et *al*., 2010). No preference ordering over these KLD categories is theoretically conceivable (Mitchell et *al*. 1997).

The sets of strengths and concerns vary across KLD dimensions and across time periods. In order to construct our SP measure, we first compute average scores of strengths and of concerns for each dimension (Harjoto and Jo, 2008); the difference between these averages is a dimension-specific rating. Our SP measure is a simple average of these ratings over all dimensions. Formally:

$$SP_t = \frac{1}{N}\sum_{n=1}^{N}\left(\frac{1}{T_{nt}^{p}}\sum_{i=1}^{T_{nt}^{p}} Strenghts_i - \frac{1}{T_{nt}^{q}}\sum_{j=1}^{T_{nt}^{q}} Concerns_j\right)$$

where N is the total number of KLD dimensions, T_{nt}^{p} is the total number of strengths for dimension n in year t, T_{nt}^{q} the total number of concerns for dimension n in year t. As in Hillman and Keim (2001), and Callan and Thomas (2009), our SP measure does not take into account KLD exclusion criteria.

5.3. Control variables

The most commonly-used control variables found in the literature are: size, risk, spending on R&D, and industry (Ullmann, 1985; Aupperle et *al.*, 1985; Waddock and Graves, 1997; Mc Williams and Siegel, 2000; Hillman and Keim, 2001; Andersen and Dejoy, 2011). All are considered in this research.

We measure firm size through the logarithm of the market value of its shares. This logarithmic transformation alleviates the problem of *skewness* caused by the presence of extreme values.

Two measurements have been considered to control the effect of risk upon the SP-FP relationship: (1) the beta coefficient, and (2) the financial leverage, Systematic risk is measured by the market beta through use of the CAPM. Financial leverage is the ratio of long-term net debt over the market value of shares. Including separately these two risk measures in the analysis of the SP-FP relationship allows us to control for differing risk profiles present in our sample set.

Three *proxies* have been considered to account for the effects of investment; those of spending on R&D, advertising and fixed assets. The 'spending on investment' variable, invoked by the ratio of total spending on R&D, advertising and fixed assets divided by the total of assets, allows us to assess the effect of the different investment forms on FP.

Several studies assess the effect of 'industry' on the SP-FP relationship (Aupperle et *al*., 1985; Waddock and Graves, 1997; Pava and Krausz, 1996; Hillman and Keim, 2001). Economies of scale, intensity of competition seem to account for some variation in FP between different sectors of activity (McWilliams and Siegel, 2000). Following most researchers, we have considered a control variable to assess the affiliation of each company to an activity sector through binary variables representing the 48 industries identified in the Fama and French (1997) classification system.

Table 4 summarizes the variables retained in this study.

Table 4: Variables and Measurements

Key variables	**Measurements**
Financial performance	Rate of return on asset: ROA
Social performance	Equally-weighted SP: SP
Size	Logarithm of market value of shares: size
Systematic risk	Market beta: beta
Financial leverage	Long-term debt - (cash+tradable securities)/ market value of shares: levnet
Industry	SIC according to Fama and French (1997) classification system: sec
Investment	(spending on R&D + spending on advertising + spending on fixed assets)/total assets: invest

Lastly, in order to identify possible moderating effects (Orlitsky et *al*., 2003; Lankoski, 2008; Van Beurden and Gossling, 2008), we have introduced interaction terms into our model. The combined effect of certain company-specific factors such as size, risk and investment with SP, is likely to reinforce or temper any impact upon FP. For example, the introduction of the interactive term (SP*size) allows us to assess the combined effect of SP and size on FP. This term serves to evaluate the way in which the impact of SP on FP is influenced by size. In the same way, in order to evaluate the moderating effect of risk on the relationship, we have added the interactive term (SP*beta). Introducing the crossed term (SP*invest) has allowed us to assess a possible variation in SP impact on FP following a change in spending on investment.

5.4. Multivariate analysis

Staring from the highlighted points in the literature and by considering the different variables retained as determiners of FP, several models were examined. In order to appreciate the impact of SP on FP in the setting of a cross-sectional analysis, we consider the following regression model on the pooled data:

$$\begin{aligned} ROA_{i,t} &= \alpha_1 + \beta_1 SP_{i,t-1} + \beta_2 size_{i,t-1} + \beta_3 beta_{i,t-1} + \beta_4 levnet_{i,t-1} + \beta_5 invest_{i,t-1} \\ &+ \sum_{j=1}^{47} \delta_j D\sec_j + \sum_{k=1}^{16} \rho_k Dan_k + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where *i* and *t* are company and year indices, $Dsec_j$ and Dan_k represent dummy variables for the effects of industry and of time respectively and ε is the error term.

In order to test the effect of moderating variables upon the SP-FP relationship, we propose an extension to model (1) that introduces the interactive terms SP*size, SP*risk and SP*invest. The model becomes:

$$\begin{aligned} ROA_{i,t} &= \alpha_1 + \beta_1 SP_{i,t-1} + \beta_2 size_{i,t-1} + \beta_3 beta_{i,t-1} + \beta_4 levnet_{i,t-1} + \beta_5 invest_{i,t-1} \\ &+ \beta_6 PS_{i,t-1} \times size_{i,t-1} + \beta_7 SP_{i,t-1} \times beta_{i,t-1} + \beta_8 SP_{i,t-1} \times invest_{i,t-1} \\ &+ \sum_{j=1}^{47} \delta_j D\sec_j + \sum_{k=1}^{16} \rho_k Dan_k + \varepsilon_{i,t} \end{aligned} \quad (2)$$

The new specification (2) has allowed us to detect a possible moderating effect of size, risk and investment. The evaluation of this model allows hypotheses 2a, 2b, and 2c to be tested. In fact, by using model (2) we have identified an indirect effect of SP upon FP, conditioned by company size, its degree of risk and its investment level. The sign and significance of coefficients $\beta_7, \beta_8 et \beta_9$ determine whether the effect of size, investment and risk have a tempering (i.e. significantly negative) or a reinforcing (significantly positive) effect on the impact of SP on FP.

In order to assess the sensitivity of the relationship at different *SP* levels, and therefore to test hypothesis 1, three formulations have been considered. The first one, proposed in model (3), allows for asymmetry in the relationship to be analysed:

$$\begin{aligned} ROA_{i,t} &= \alpha_1 + \beta_{11} SPn_{i,t-1} + \beta_{12} SPp_{i,t-1} + \beta_2 size_{i,t-1} + \beta_3 beta_{i,t-1} + \beta_4 levnet_{i,t-1} \\ &+ \beta_5 invest_{i,t-1} + \beta_{61} SPn_{i,t-1} \times size_{i,t-1} + \beta_{62} SPp_{i,t-1} \times size_{i,t-1} \\ &+ \beta_{71} SPn_{i,t-1} \times beta_{i,t-1} + \beta_{72} SPp_{i,t-1} \times beta_{i,t-1} + \beta_{81} SPn_{i,t-1} \times invest_{i,t-1} \\ &+ \beta_{82} SPp_{i,t-1} \times invest_{i,t-1} + \sum_{j=1}^{47} \delta_j D\sec_j + \sum_{k=1}^{16} \rho_k Dan_k + \varepsilon_{i,t} \end{aligned} \quad (3)$$

where $SPn_{i,t-1} = \Pi_{SP_{t-1}<0} SP_{i,t-1}$, $SPp_{i,t-1} = \Pi_{SP_{t-1}>0} SP_{i,t-1}$, and $\Pi_B = 1$ if statement *B* is true, $\Pi_B = 0$ otherwise.

The relationship is asymmetric if equal variations in *SPn* and *SPp* lead to different variations in FP (i.e. if the coefficients β_{11} and β_{12} differ).

The second formulation proposed to test hypothesis 1, namely model (4), allows for a possible effect of SP on FP in stages, as suggested by Johnson (2003). Three stages are considered, according as a company's *SP* is low, medium or high:

$$\begin{aligned} ROA_{i,t} &= \alpha_1 + \beta_{11} SPf_{i,t\text{-}1} + \beta_{12} SPm_{i,t\text{-}1} + \beta_{13} SPe_{i,t\text{-}1} + \beta_2 size_{i,t\text{-}1} + \beta_3 beta_{i,t\text{-}1} \\ &+ \beta_4 levnet_{i,t\text{-}1} + \beta_5 invest_{i,t\text{-}1} + \beta_{61} SPf_{i,t\text{-}1} \times size_{i,t\text{-}1} + \beta_{62} SPm_{i,t\text{-}1} \times size_{i,t\text{-}1} \\ &+ \beta_{63} SPe_{i,t\text{-}1} \times size_{i,t\text{-}1} + \beta_{71} SPf_{i,t\text{-}1} \times beta_{i,t\text{-}1} + \beta_{72} SPm_{i,t\text{-}1} \times beta_{i,t\text{-}1} \\ &+ \beta_{73} SPe_{i,t\text{-}1} \times beta_{i,t\text{-}1} + \beta_{81} SPf_{i,t\text{-}1} \times invest_{i,t\text{-}1} + \beta_{82} SPm_{i,t\text{-}1} \times invest_{i,t\text{-}1} \\ &+ \beta_{83} SPe_{i,t\text{-}1} \times invest_{i,t\text{-}1} + \sum_{j=1}^{47} \delta_j D\sec_j + \sum_{k=1}^{16} \rho_k Dan_k + \varepsilon_{i,t} \end{aligned} \quad (4)$$

where $SPf_{i,t-1} = \Pi_{SP_{i,t-1} \le 0,25} SP_{i,t-1}$, $SPm_{i,t-1} = \Pi_{0,25 < SP_{i,t-1} \le 0,75} SP_{i,t-1}$, $SPe_{i,t-1} = \Pi_{SP_{i,t-1} > 0,75} SP_{i,t-1}$.

This formulation is all the more justifiable as Johnson (2003) suggests that the impact of SP on FP varies as a function of the different states of SP developed by the company. According to the author, this impact only seems to be noted at extreme SP levels; negative for irresponsible companies, positive for proactive companies and neutral for intermediate SP levels. The argument corroborates that of Lankoski (2000), who proposes that when SP costs are relatively weak compared to production costs, their impact on FP is negligible. As a consequence, for medium SP levels, the intensity of the relationship is so weak that it is difficult to evaluate it empirically. However, if SP is sufficiently high the financial impact may become more pronounced.

A last specification has been added to distinguish between four SP levels obtained as a function of quartiles, namely first (25%), second (50%) and third (75%). Contrarily to model (4), this specification allows us to split the middle SP range. This would induce a refinement to stages proposed by Johnson (2003), namely (1) irresponsibility, (2) regulatory CSR, (3) fragmented CSR and (4) strategic CSR.

$$\begin{aligned} ROA_{i,t} &= \alpha_1 + \beta_{11} SP1_{i,t\text{-}1} + \beta_{12} SP2_{i,t\text{-}1} + \beta_{13} SP3_{i,t\text{-}1} + \beta_{14} SP4_{i,t\text{-}1} + \beta_2 size_{i,t\text{-}1} \\ &+ \beta_3 beta_{i,t\text{-}1} + \beta_4 levnet_{i,t\text{-}1} + \beta_5 invest_{i,t\text{-}1} + \beta_{61} SP1_{i,t\text{-}1} \times size_{i,t\text{-}1} \\ &+ \beta_{12} SP2_{i,t\text{-}1} \times size_{i,t\text{-}1} + \beta_{63} SP3_{i,t\text{-}1} \times size_{i,t\text{-}1} + \beta_{64} SP4_{i,t\text{-}1} \times size_{i,t\text{-}1} \\ &+ \beta_{71} SP1_{i,t\text{-}1} \times beta_{i,t\text{-}1} + \beta_{72} SP2_{i,t\text{-}1} \times beta_{i,t\text{-}1} + \beta_{73} SP3_{i,t\text{-}1} \times beta_{i,t\text{-}1} \\ &+ \beta_{74} SP4_{i,t\text{-}1} \times beta_{i,t\text{-}1} + \beta_{81} SP1_{i,t\text{-}1} \times invest_{i,t\text{-}1} + \beta_{82} SP2_{i,t\text{-}1} \times invest_{i,t\text{-}1} \\ &+ \beta_{83} SP3_{i,t\text{-}1} \times invest_{i,t\text{-}1} + \beta_{84} SP4_{i,t\text{-}1} \times invest_{i,t\text{-}1} + \sum_{j=1}^{47} \delta_j D\sec_j \\ &+ \sum_{k=1}^{16} \rho_k Dan_k + \varepsilon_{i,t} \end{aligned} \quad (5)$$

with $SP1_{i,t-1} = \Pi_{SP_{i,t-1} \le 0,25} SP_{i,t-1}$, $SP2_{i,t-1} = \Pi_{0,25 < SP_{i,t-1} \le 0,5} SP_{i,t-1}$, $SP3_{i,t-1} = \Pi_{0,5 < SP_{i,t-1} \le 0,75} SP_{i,t-1}$ and $SP4_{i,t-1} = \Pi_{PS_{i,t-1} > 0,75} PS_{i,t-1}$.

To test hypothesis 3, the previous models were estimated over several sub-periods. To detect any significant change in the time of impact of SP on FP, following the example of Baron et *al*. (2009), our sample was divided into the two sub-periods 1991-2000 and 2001-2007. The models were also assessed over 3-, 4- and 5-year windows, allowing us to see any significant change over time of the coefficients of the explanatory variables.

The analysis of the five models was carried out using *Pooled time-series cross-section* regression models applied to the *panel* data and evaluated by the method of ordinary least squares (MCO). The evaluation of the *Pooled time-series cross-section* model allows the use of a double dimension: individual and temporal. The standard errors are adjusted for heteroscedasticity and corrected according to the segmentation (*cluster*) method. In order to avoid potential distortions caused by the presence of extreme values, all models use *winsorised* variables (except for the measurement of SP). The appraisals made in the setting of this study rest on the non-balanced sample set of *panel* data made up of 21172 company-year observations in the period 1991-2007. In addition, in order to verify the possible co-linearity between the explicative variables (including retarded variables), the indicator of variance inflation (*Variance Inflation Factor*, VIF) has been calculated using the

program STATA. A value less than 10 indicates that co-linearity between the variables is tolerable. Overall, co-linearity does not appear to introduce significant biases into our estimation.

6. EMPIRICAL RESULTS

6.1. Descriptive statistics

Table 5 displays descriptive statistics for FP, SP and other explanatory variables. The companies in our sample have a median SP score of –0.017 and standard deviation of 4.3%. On average, they are profitable (i.e. Average ROA = 7.8%). The sample set includes companies of large size with a high risk level. The average size (coefficient of variation) is 7.544 billion dollars (150%) and the average risk level (coefficient of variation) is 1.137 (84.8%). This means that the sample exhibits disparities and heterogeneity as far as risk is concerned.

Table 5: Summary of Descriptive Statistics

Variable	N	Mean	Standard Deviation	Min	Max
ROA	21917	.078	.107	–.412	.359
SP	21917	–.017	.043	–.278	.199
SPp	21917	.008	.017	.000	.199
SPn	21917	–.025	.034	–.278	.000
SPf	21917	–.018	.036	–.278	.000
SPm	21917	–.006	.011	–.037	.008
SPe	21917	.007	.017	.000	.199
SP1	21917	–.018	.036	–.278	0
SP2	21917	–.006	.010	–.037	0
SP3	21917	–.000	.002	–.012	.007
SP4	21917	.007	.016	.000	.199
size	21870	7.544	1.504	2.204	13.138
beta	21625	1.137	.848	–.180	4.234
levnet	21901	.146	.268	–.831	2.592
Invest	21901	.092	.097	.000	1.500

Notes: Table 5 shows the descriptive statistics of the different variables used for a non-balanced panel of 21172 company-year observations over the period 1991-2007. ROA is the indicator of FP, measured by the rate of return of the asset. SP is the measurement of global SP that combines strengths and concerns. SPp represents a positive SP score. SPn is the score of a negative SP. SPf is the score of the SP belonging to the 25% percentile. SPm is the score of the SP above the 25% percentile and below the 75% percentile, and SPe is the score of the SP belonging to the 75% percentile. SP1 is the SP score from the first quartile. SP2 is the SP score from the second quartile. SP3 is the SP score from the third quartile. SP4 is the SP score from the fourth quartile. Beta is the systematic risk, measured by the market beta derived from CAPM. Size is measured by the market value of shares logarithm. Levnet, financial leverage, is measured by comparison of the long-term net debt on the market value of shares. Invest is the measurement of spending on R&D and advertising, calculated by the ratio of the sum of spending on R&D, advertising and in investment (fixed assets), divided by total assets.

Table 1A in the appendix presents the correlation matrix for variables used in the regression models. It shows that SP correlates positively with ROA and that investment correlates negatively with size and financial leverage. What is particularly interesting is that the sign of the correlation between ROA and SP changes as a function of the level of SP. For companies with a positive or medium SP (SPp, SPm, SP2 or SP3), the correlation with ROA is positive. However, the correlation is negative at low SP levels (SPn or SPf). This result corroborates the central argument of this research, that the relationship is non-linear and varies as a function of SP level. The correlation between SP and risk also varies as a function of SP level. The correlation is negative for high SP levels and positive for low SP levels.

6.2. The impact of SP on FP is not monotonic

Tables 6 and 7 present the estimates obtained from models (1) through (5).

Table 6: Pooled Regression of Models (1) and (2) over the Period 1991-2007

	Model 1	**Model (2)**
Dependent Variable	**ROA**	**ROA**
SP	.216*** (.027)	–.017 (.145)
Beta	–.028*** (.001)	–.031*** (.001)
Size	.019*** (.001)	.020*** (.001)
Levnet	–.047*** (.006)	–.048*** (.006)
Invest	–.205*** (.024)	–.197*** (.025)
SP*size		.038** (.016)
SP*invest		.631 (.472)
SP*beta		–.140*** (.033)
Intercept	.038 (.024)	.035 (.023)
Industry dummies	Yes	Yes
Year dummies	Yes	Yes
Observations	21172	21172
R^2	.299	.302

*Note. ***significant at the 1% level (p<0.01); **significant at 5% (p<0.05); *significant at 10% (p<0.1)*

Table7: Analysis of the Pooled Regression of Models (3), (4) and (5) over the Period 1991-2007

	Model (3)	**Model (4)**	**Model (5)**
SPn	–.336* (.184)		
SPp	.807** (.376)		
SPf		–.348* (.183)	
SPm		–.497 (.504)	
SPe		.829** (.383)	
SP1			–.353* (.184)
SP2			–.461 (.503)
SP3			–1.874 (1.780)
SP4			.838** (.385)
Beta	–.031*** (.002)	–.033*** (.002)	–.033*** (.002)
Size	.023*** (.001)	.024*** (.001)	.0244*** (.001)
Levnet	–.047*** (.006)	–.047*** (.006)	–.047*** (.006)
Invest	–.268*** (.031)	–.262*** (.033)	–.265*** (.034)
SPn*size	.102*** (.020)		
SPp*size	–.150*** (.042)		
SPn*invest	–1.473** (.666)		
SPp*invest	5.753*** (.987)		
SPn*beta	–.133*** (.040)		
SPp*beta	–.076 (.100)		
SPf*size		.104*** (.020)	
SPm*size		.153** (.062)	
SPe*size		–.158*** (.043)	
SPf*invest		–1.336** (.659)	
SPm*invest		–1.110 (1.480)	
SPe*invest		5.497*** (.997)	
SPf*beta		–.141*** (.040)	
SPm*beta		–.379*** (.110)	
SPe*beta		–.012 (.101)	
SP1*size			.105*** (.020)
SP2*size			.148** (.062)
SP3*size			.379* (.217)
SP4*size			–.160*** (.043)
SP1*invest			–1.383** (.662)
SP2*invest			–1.133 (1.478)
SP3*invest			–3.937 (5.139)
SP4*invest			5.574*** (1.010)
SP1*beta			–.140*** (.040)

	Model (3)	**Model (4)**	**Model (5)**
SP2*beta			–.380*** (.110)
SP3*beta			–.313 (.417)
SP4*beta			–.013 (.101)
Intercept	.038 (.024)	.009 (.025)	.009 (.025)
Industry dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Number of observations	21172	21172	21172
R2	0.299	0.310	.310

Model (1), without interactions, displays a strong SP-FP association. In model (2), this direct association is replaced by strong interactions of SP with size and with risk. Models (3) to (5) display locally strong associations, depending on SP ranges. However, the most novel observation is a confirmation of the asymmetry in the SP-FP relation. It appears indeed that the marginal impact of SP on FP depends on the SP range, with similar sign reversals across all three models. There is thus a strong presumption in favour of Hypothesis 1. We now discuss each model in more detail.

The results of model (3) indicate that the effect of SP on FP varies according to whether SP is positive or negative. The financial impact is significantly positive for companies with a positive SP, significantly negative for companies with a negative SP. Thus companies enjoying a positive SP may profit from a positive effect of their social actions. Conversely, the effect of socially responsible actions is negative for companies with inferior social performance. This result agrees with that of Moon (2007) who showed that positive social actions and negative social actions affect FP in an asymmetric manner.

The estimation of model (4), which examines the effect of three SP levels, is along the same lines. The effect of SP is negative for companies with a low SP score, more or less neutral for companies with medium levels of social engagement, and positive for companies with a high SP. This result corroborates those of Bouquet and Deutsch (2008), who propose that companies with an intermediate level of SP and which display a minimal conformity to regulations and to stakeholder pressure do not benefit from a positive financial impact. And that actually achieving the financial benefits of SP requires a genuinely proactive approach that goes above and beyond mere conformity to regulations.

The dependence of the SP-FP relationship as a function of the level of social engagement is also supported by the results of model (5). Companies with a low (1st quartile) SP rating undergo a negative SP-FP relationship, whereas those with a high (4th quartile) SP rating experience a positive one. The relationship is indeterminate over intermediate SP ranges. In the same vein, Johnson (2003) asserts that being socially responsible does not necessarily offer financial benefits to companies who simply adhere to regulations, or to those who engage in CSR in a fragmented way. Conversely, FP can be improved for companies who opt to implement CSR strategically.

6.3. Significance of control and moderating variables

Table 8 indicates a significant direct impact of most control variables. Company size (resp. risk, spending on R&D and advertising) is positively (negatively) related to ROA, implying that large companies (the least risky, least innovative) appear to generate more FP that small (riskier, more innovative) companies. These effects are consistent across all models. It must however be noted that industry never appears as a significant factor.

Company size, beta and spending on R&D and advertising are also used as moderators in models (2)-(5). Table 8 summarises significant interaction terms.

Table 8: Significant interactions with SP

	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Size	+	+ for low SP – for high SP	+ for low SP – for high SP	+ for low SP – for high SP
Invest		– for low SP + for intermediate SP	– for low SP + for high SP	– for low SP + for high SP
Beta	–	– for low SP	– for low and intermediate SP	– for low and intermediate SP

Notes: +/– : sign of interaction coefficient. Reported effects are significant at a 5% level or better.

The direct SP-FP impact seen in model (1) loses its significance when interactions are introduced in model (2). The interaction of SP with size and risk is significant and suggests that these factors play a moderating role on the SP-FP relationship. The significant positive coefficient of the cross term (SP*size) shows an amplifying effect of size. That is, large companies benefit more (financially) from their social engagement than small companies. This conclusion concurs with Ioannou and Serafeim (2010), who demonstrated the occurrence of a

moderating effect of size, as a *proxy* for visibility. CSR strategies of the most visible companies is said to affect positively the perceptions of financial analysts, and therefore their FP.

The coefficient of the interaction term (SP*beta) in model (2) is significantly negative. This shows a dampening effect of risk. High-risk companies benefit less from the financial advantages of their social engagements than those with lower risk. The interaction term (SP*invest) is not significant: spending on R&D and advertising R&D and advertising does not have a moderating effect, thus confirming Wang and Choi (2013).

In summary for model (2), while SP does not seem to directly affect FP, it is in fact the indirect effect of SP, via size and risk level, that affects FP. It is important to note that this is a pure moderating effect because the SP-FP relationship is not significant. The variable size (risk) has thus a pure positive (negative) moderating effect upon the financial impact of SP. This means that the greater the company size (risk level), the stronger (weaker) the SP-FP relationship. Our explanation for the neutrality of the direct SP-FP relationship furthers the analysis of Surroca et *al*. (2010), for whom the positive impact of SP upon FP is deceptive.

In order to test the moderating effect of size, risk level and spending on R&D and advertising while taking into account a possible non-linear SP-FP relationship, models (3), (4) and (5) have been used. The results obtained from these alternative models support our conclusions as to the importance of introducing size, risk level and spending on R&D and advertising as moderating factors.

The results of model (3) show that the factor of size has a reductive effect, whereas risk level and spending on R&D and advertising exert an amplifying effect on the relationship. The significant negative coefficient of the interaction term (SPp*size) means that the marginal positive effect of SPp on FP decreases with size. Thus size attenuates the positive impact of SP upon FP for companies with a positive SP. For companies with negative SP, the coefficient of the cross-term (SPn*size) is significant and positive), which suggests also that size attenuates the marginal negative effect of SPn on FP.

The results from model (3) also indicate that the effect of risk depends upon the level of SP. The moderating effect of risk is significant and negative for sampled companies with negative SP. This result implies that risk amplifies the negative effect of SP on FP for companies with a negative social side. In effect, companies with a negative social rating and a high level of risk are more financially penalised than companies with a low risk level. The moderating effect of risk is however not significant for companies with a positive SP rating.

The significant positive coefficient of the interaction term (SPp*invest) supports a amplifying effect of spending on R&D and advertising for companies with positive SP. For such companies, the positive financial effect of SP is stronger for the most innovative companies. The significant negative coefficient interaction term (SPn*invest) shows that spending on R&D and advertising also amplifies the negative effect of SPn on FP. This result suggests that the negative financial impact of SP for companies with a negative social rating is all the greater for the most innovative companies.

In summary, model (3) highlights two opposing effects: risk, which plays an attenuating role, and size and spending on R&D and advertising that exert an amplifying effect. The existence of these indirect effects of SP on FP, by the bias of the factors of size, risk level and spending on R&D and advertising, demonstrates the contingent character of the relationship, but it also takes into account the non-linear dynamic of this link.

Models (4) and (5) highlight the attenuating effect of size, regardless of SP level. They also indicate that the effect of risk depends on the SP level. The level of risk amplifies the negative financial impact of social actions for companies of low or medium SP level. For companies of high SP, the level of risk has no bearing whatsoever on the SP-FP relationship.

Models (4) and (5) also indicate an amplifying effect of spending on R&D and advertising at low or high SP levels. The negative financial impact of SP for irresponsible companies is all the greater when these companies are innovative.

The following general conclusions can be reached regarding moderating effects: (i) Our results are broadly consistent across models. (ii) They indicate significant moderating effects of risk, size and spending on R&D and advertising, thus adding credibility to hypotheses 2a, 2b and 2c. (iii) They indicate that these effects also depend significantly on the level of SP. This accentuates the picture of a complex set of associations between variables.

6.4. The impact of SP on FP varies with time

In order to test hypothesis 3, which states that the impact of SP on FP is stable over time, we shall use the results of models (2), (3) and (4) applied to the entire period of study (1991-2007) as a basis for comparison. We then apply the same models on two time divisions: division 1 consists in the two sub-periods 1991-2000 and 2001-2007. Division 2 consists in 4 sub-periods: 1991-1994, 1995-1999, 2000-2002 and 2003-2007. The latter division enables us to isolate the effect of the period 2000-2002, corresponding to the burst of the Internet bubble, and to distinguish the period of growth experienced in the 90's (1991-1999) from the period of economic slowdown 2001-2007.

The results summarised in tables 9, 10 and 11 show that the impact of SP on FP varied over time, regardless of the model. In early years, the SP-FP relationship was not significant in general. In more recent times, the impact of SP on FP increased. The results from model (2) (table 9) suggest that the impact of SP on FP is only significant and negative at the 10% threshold over the period 2003-2007. When we distinguish the negative impacts from the positive impacts of SP on FP (model (3)), the variation in behaviour of the relationship becomes clearer. The impacts of SPn and of SPp on FP over the total sample set are negative at the 5% threshold and positive at the 10% threshold respectively. They become non-significant over the sub-period 1991-2000, and significant at the 1% threshold over 2001-2007. These results are confirmed by the second time division, in which the relationship is only significant on the sub-period 2003-2007.

Table 9: Analysis of the *Pooled* Regression of Model (2) over Time

Period	**1991-2000**	**2001-2007**	**1991-1994**	**1995-1999**	**2000-2002**	**2003-2007**	**1991-2007**
SP	.012 (.225)	–.205 (.148)	.179 (.304)	–.283 (.250)	.361 (.252)	–.296* (.152)	–.017 (.145)
Beta	–.008** (.003)	–.030*** (.002)	–.007 (.006)	–.006 (.005)	–.052*** (.004)	–.027*** (.002)	–.031*** (.001)
Size	.014*** (.001)	.020*** (.001)	.014*** (.002)	.015*** (.001)	.016*** (.001)	.020*** (.001)	.020*** (.001)
Levnet	–.085*** (.012)	–.042*** (.007)	–.098*** (.018)	–.079*** (.015)	–.072*** (.013)	–.039*** (.007)	–.048*** (.006)
Invest	.114*** (.038)	–.275*** (.029)	.094** (.042)	.106** (.049)	.047 (.052)	–.295*** (.031)	–.197*** (.025)
SP*size	.012 (.022)	.065*** (.017)	.005 (.030)	.032 (.027)	–.01 (.025)	.073*** (.017)	.038** (.016)
SP*invest	.453 (.527)	.13 (.579)	.11 (.594)	1.079 (.823)	1.168 (.953)	–.179 (.597)	.631 (.472)
SP*beta	.017 (.063)	–.130*** (.037)	–.038 (.091)	.061 (.087)	–.143 (.094)	–.092** (.038)	–.140*** (.033)
Constant	.088*** (.013)	–.009 (.021)	.110*** (.018)	.068*** (.017)	–.039** (.015)	.015 (.023)	.035 (.023)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# observations	5800	15372	2309	2899	2651	13313	21172
R^2	.356	.339	.399	.361	.366	.354	.302

Table 10: Analysis of the *Pooled* Regression of Model (3) over Time

Period	**1991-2000**	**2001-2007**	**1991-1994**	**1995-1999**	**2000-2002**	**2003-2007**	**1991-2007**
SPn	–.339 (.326)	–.515*** (.173)	–.233 (.467)	–.610 (.387)	–.385 (.294)	–.521*** (.174)	–.336* (.184)
SPp	.519 (.451)	1.088*** (.358)	.911 (.600)	.241 (.444)	1.722*** (.495)	.851** (.359)	.807** (.376)
Beta	–.009* (.005)	–.029*** (.002)	–.006 (.007)	–.008 (.007)	–.047*** (.004)	–.027*** (.002)	–.031*** (.002)
Size	.017*** (.002)	.0238*** (.001)	.016*** (.002)	.018*** (.002)	.022*** (.002)	.023*** (.001)	.023*** (.001)
Levnet	–.083*** (.012)	–.041*** (.007)	–.097*** (.018)	–.076*** (.015)	–.069*** (.013)	–.040*** (.007)	–.047*** (.006)
Invest	.141*** (.045)	–.334*** (.033)	.124** (.055)	.127** (.054)	.005 (.062)	–.341*** (.035)	–.268*** (.031)
SPn*size	.051 (.031)	.120*** (.019)	.0454 (.0461)	.075** (.038)	.078** (.031)	.118*** (.019)	.102*** (.020)
SPp*size	–.059 (.047)	–.163*** (.044)	–.079 (.067)	–.057 (.052)	–.190*** (.052)	–.138*** (.044)	–.150*** (.042)
SPn*invest	1.259 (.769)	–1.617** (.706)	.911 (1.050)	1.813* (1.086)	.352 (1.283)	–1.739** (.727)	–1.473** (.666)
SPp*invest	–.414 (.900)	6.572*** (1.480)	–.965 (1.116)	.571 (1.177)	4.307** (1.944)	6.359*** (1.524)	5.753*** (.987)
SPn*beta	.022 (.091)	–.104** (.044)	–.0030 (.132)	.0462 (.126)	.004 (.108)	–.073 (.045)	–.133*** (.040)

Period	**1991-2000**	**2001-2007**	**1991-1994**	**1995-1999**	**2000-2002**	**2003-2007**	**1991-2007**
SPp*beta	.073 (.136)	–.242** (.113)	–.0628 (.170)	.168 (.182)	–.559* (.293)	–.209* (.113)	–.076 (.100)
Constant	.066*** (.017)	–.033 (.022)	.088*** (.025)	.043* (.022)	–.081*** (.019)	–.008 (.022)	.011 (.024)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# observations	5800	15372	2309	2899	2651	14353	21172
R^2	.359	.344	.401	.366	.373	.351	.310

This result is also supported by model (4), according to which the coefficients of SPf, SPm and SPe are not significant over the period 1990-2000, in contrast to the period 2001-2007.

Table 11: Analysis of the *Pooled* Regression of Model (4) over Time

Period	**1991-2000**	**2001-2007**	**1991-1994**	**1995-1999**	**2000-2002**	**2003-2007**	**1991-2007**
SPf	–.408 (.313)	–.538*** (.174)	–.278 (.461)	–.753** (.365)	–.381 (.292)	–.559*** (.183)	–.348* (.183)
SPm	.877 (.896)	–1.089** (.537)	.526 (1.507)	1.134 (1.165)	–.547 (1.124)	–1.142** (.557)	–.497 (.504)
SPe	.416 (.433)	1.218*** (.366)	.827 (.597)	.112 (.414)	1.730*** (.514)	.994*** (.384)	.829** (.383)
Beta	–.012** (.005)	–.030*** (.002)	–.005 (.008)	–.015* (.008)	–.048*** (.005)	–.028*** (.002)	–.033*** (.002)
Size	.016*** (.002)	.024*** (.001)	.016*** (.003)	.017*** (.002)	.022*** (.002)	.024*** (.001)	.024*** (.001)
Levnet	–.083*** (.012)	–.041*** (.007)	–.097*** (.018)	–.076*** (.015)	–.069*** (.013)	–.038*** (.007)	–.047*** (.006)
Invest	.164*** (.050)	–.341*** (.036)	.130** (.061)	.160*** (.060)	.013 (.068)	–.359*** (.039)	–.262*** (.033)
SPf*size	.058* (.030)	.123*** (.019)	.051 (.046)	.090** (.036)	.079** (.031)	.123*** (.020)	.104*** (.020)
SPm*size	–.070 (.098)	.219*** (.068)	–.029 (.175)	–.062 (.124)	.106 (.139)	.217*** (.072)	.153** (.062)
SPe*size	–.049 (.046)	–.184*** (.045)	–.074 (.068)	–.049 (.052)	–.195*** (.055)	–.161*** (.048)	–.158*** (.043)
SPf*invest	1.221 (.768)	–1.483** (.701)	.858 (1.047)	1.809* (1.092)	.264 (1.257)	–1.626** (.741)	–1.336** (.659)
SPm*invest	5.096** (2.265)	–2.669* (1.527)	2.200 (2.792)	7.262** (2.923)	1.684 (3.917)	–3.250** (1.595)	–1.110 (1.480)
SPe*invest	–.905 (.932)	6.662*** (1.498)	–1.043 (1.164)	–.197 (1.228)	4.104** (2.013)	6.059*** (1.627)	5.497*** (.997)
SPf*beta	.025 (.090)	–.109** (.043)	.006 (.131)	.0350 (.124)	–.011 (.109)	–.091** (.046)	–.141*** (.040)
SPm*beta	–.365 (.247)	–.240** (.114)	.067 (.336)	–.925** (.406)	–.148 (.400)	–.166 (.114)	–.379*** (.110)
SPe*beta	.128 (.133)	–.194* (.114)	–.055 (.173)	.298 (.185)	–.491 (.309)	–.110 (.116)	–.012 (.101)
Constant	.071*** (.018)	–.037* (.022)	.088*** (.026)	.052** (.024)	–.082*** (.021)	–.009 (.024)	.0097 (.025)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5800	15372	2309	2899	2651	13313	21172
R^2	.362	.345	.403	.372	.373	.360	.310

In summary, the examination of the impact of SP on FP over different sub-periods confirms the hypothesis that the relationship is not stable over time. This result agrees with the conclusion of certain recent studies that suggest the relationship varies over time (Lankoski, 2008; Paton and Elsayed, 2005; Barnett, 2007; Bird et *al*., 2007; Brammer and Millington, 2008; Ioannou and Serafeim, 2010). Our results demonstrate that the impact of

SP on FP has been more significant during recent periods than during previous periods. On fact, during recent periods, the market seems to have been sensitive to different SP levels. Only those companies who are proactive in terms of their CSR practises benefit from a positive financial return. Companies with a medium or low level of SP are penalised by the market. For previous periods, the direct impact of SP on FP was non-significant. However, the effect of SP combined with other financial variables such as size, level of risk and spending on R&D and advertising does affect FP. It must also be noted that the significance of these moderating factors changes over time. For example, in the period 1991-2000, size, risk and R&D and advertising factors, which play no role in the SP-FP relationship, were significant over the most recent period 2001-2007.

These results demonstrate the evolution of the CSR concept, which has grown in credibility and legitimacy in recent years and in which social engagement is seen as being positive by the market. The institutionalisation of CSR, the evolution of stakeholders' perceptions and of social standards as well as the accessibility of social and environmental information are all factors explaining the evolution of the relationship dynamic. Our explanation of these results furthers the work of Lankoski (2008), for whom the exogenous factors that determine the SP-FP relationship are not necessarily stable. The author thus opts for a relationship of retarded effect that depends on the evolution of a combination of company-specific factors and social issues. Barnett and Salomon (2006) highlight also that this relationship is not stable given the fact that market preferences for certain CSR dimensions change over time. The great change in stakeholder characteristics and preferences, in different contexts and at different times, is another explanation for the instability of the relationship (Griffin, 2000).

7. CONCLUSION

Several social, environmental and governance crises have fostered concerns about corporate social responsibility. CSR is nowadays an established expectation of stakeholders, and its neglect is considered a source of extra-financial risk. However, the nature of the impact of SP on FP remains subject to debates both in academic and managerial circles.

The present study rests on a sample of 21 172 observations with coherent SP and FP measures over the entire 17 years horizon. The recent literature suggests that the linear SP-FP relations are inappropriate and that some firm characteristics (size, risk, particular SP components) cannot be treated as control variables. In the spirit of suggestions by Orlitsky et al. (2003), we consider a non-linear dependency between SP and FP and introduce size (Ioannou and Serafeim, 2010), risk (Orlitzky and Benjamin, 2001; Zyglidopoulos, 1999), and R&D (Luo and Bhattacharya, 2006; Hull and Rothenberg, 2008) as moderating variables.

Our conclusions are several. First, the relation between SP has a non-monotonic form, as SP's impact depends on its level: i.e., the marginal effect of SP on FP is negative at low levels of SP, positive at higher levels. Second, in agreement with aforementioned studies, some contextual factors have a moderating effect. Thus, size (risk, R&D) has a positive (negative) effect on FP, and tends to attenuate (reinforce) the SP-FP relation. Third, a SP-FP relation exists throughout the horizon of reference, even though it seems to have evolved with the perceived importance of CSR by stakeholders and financial analysts.

This study has several limitations. One stems from the composition of our sample. Our present sample includes American firms embedded in similar markets, this not include small businesses. Given that industrial sectors are variously affected by specific CSR components (Shalchian et al., 2006), it would be interesting to focus on individual industries, such as mining, "dirty" or "sin" industries, distribution, textile. As these sectors have been subject to consumer and investor campaigns, they may provide better clues as to the evolution of the CSR concept. Another limitation is about econometrics. We used a pooled panel. Alternative approaches could have been GMM regressions with fixed effects, or an inter-temporal model.

This study nonetheless points to some significant managerial implications. It seems less and less tenable for a firm to ignore the CSR context, particularly under conditions of high intrinsic risk, small size, and reduced R&D investment. It is in the firm's interest to identify specific CSR components relevant to its strategic positioning. Furthermore, the evolving character of CSR issues makes it imperative for the firm to maintain an active watch on its environment, to anticipate future stockholder demands and regulatory practices, so as to proactively guide its long term strategic orientations.

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APPENDIX

Table 1A. : Correlation Matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. ROA	1														
2. PS	.017*	1													
3. PSp	.085*	.649*	1												
4. PSn	-.018*	.930*	.326*	1											
5. PSf	-.025*	.856*	.227*	.956*	1										
6. PSm	.029*	.098*	.279*	-.010	-.302*	1									
7. PSe	.083*	.643*	.998*	.319*	.221*	.268*	1								
8. PS1	-.025*	.856*	.227*	.956*	1*	-.302*	.221*	1							
9. PS2	.026*	.103*	.254*	.010	-.280*	.974*	.248*	-.280*	1						
10. PS3	.013*	-.020*	.110*	-.079*	-.099*	.115*	.088*	-.099*	-.111*	1					
11. PS4	.083*	.643*	.998*	.319*	.221*	.268*	1*	.221*	.248*	.088*	1				
12. beta	-.246*	.000	-.051*	.023*	.038*	-.053*	-.051*	.038*	-.052*	-.010	-.051*	1			
13. taille	.283*	-.133*	.088*	-.208*	-.218*	.073*	.086*	-.218*	.069*	.017*	.086*	-.148*	1		
14. levnet	0.010	-.096*	-.010	-.115*	-.111*	.000	-.010	-.111*	.000	.015*	-.010	-.246*	.143*	1	
15. Invest	-.184*	.041*	.029*	.036*	.037*	-.010	.028*	.037*	-.010	.00	.028*	.276*	-.0762	-.228*	1