DOES ENVIRONMENTAL STRATEGY IMPROVE FINANCIAL PERFORMANCE?
A META-ANALYTICAL REVIEW

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Abstract:
The relationship between corporate environmental and financial performance has received a high degree of attention in research literature and the results are still contradictory. Empirical research has revealed that companies have implemented different types of environmental strategies in order to improve their environmental performance and, as a result, their financial performance. We conducted a meta-analysis and a meta-regression of 52 prior studies which confirms a significant and positive relationship between pro-active environmental strategy and financial performance, and between environmental disclosure and financial performance. This meta-analysis answers the question: ‘Does it pay to be green?’ in the affirmative.
There is an ongoing debate over the impact of corporate pro-environmental strategies on the corporate financial performance of firms. Historically, corporate environmental policies were designed primarily to meet regulatory requirements and to appease shareholders, largely as a reactive effort. In recent decades, environmental proactivism by corporations has increased due to the impact of: increasing regulatory expenses; stringent disclosure requirements for shareholders, governments, and the public; escalating civil and financial prosecutions and the increasing cost and scope of environmental liability (Freeman, 1994). However, corporate environmental strategies are also considered as a way to obtain competitive advantage. Pollution can also be regarded as the sign of an incomplete, inefficient, or ineffective use of resources (Porter & van der Linde, 1995a). Through pollution prevention, companies can realize significant savings, resulting in a cost advantage relative to competitors. Product stewardship, integrating the ‘voice of environment’ into the product design and development processes can lead to a competitive advantage through a ‘first mover’ strategy in the market of green products (Hart, 1995).

A number of studies have proposed conceptual frameworks or explanations for the existence of a causal relationship between corporate environmental performance (CEP) and corporate financial performance (CFP). Most of the research has proved that the high environmental performance of firms will enhance CFP (Al Tuwaijri, Christensen, & Hughes, 2004; Hart & Ahuja, 1996; Judge & Douglas, 1998; Montabon, Sroufe, & Narisimhan, 2007; Russo & Fouts, 1997; Sroufe, 2003; Stanwick & Stanwick, 1999) following Porter’s (1995) ‘win-win’ argument and the Natural-Resource-Based View (NRBV) of the Firm (Hart, 1995). Nevertheless, other research has concluded that CFP is negatively associated with pollution performance over a short period of time (Blacconiere & Patten, 1994; Jaggi & Freedman, 1992) or with corporate environmental proactivism over a longer period of time (Cordeiro & Sarkis, 1997; McPeak, Devirian, & Seaman, 2010; Yu, Ting, & Wu, 2009). Other studies have established that the relationship between CEP and CFP is not proved (King & Lenox, 2001; Lorraine, Collison, & Power, 2004; Murray, Sinclair, Power, & Gray, 2006).

The results of this empirical research remain conflicting, limiting the development of theory in this field. Research findings are influenced, among others factors, by sampling size across studies; industrial context; inconsistent measurement of CEP and CFP; different research methodologies and varying procedures for data collection and analysis. Most research on the relationship between CEP and CFP has used market-based or accounting-based measures of financial performance; some has used organizational-measures of financial performance such
as product stewardship, eco-design, environment-related product or processes, environmental innovation and environmental investments (Hassel, Nilson, & Nyquist, 2005). Most studies have used negative externalities such as pollutant emissions to measure CEP (Earnhart & Lizal, 2007), others have used data of the Toxic Release Inventory (Clarkson & Li, 2004; Dooley & Lerner, 1994; Hamilton, 1995) while yet others have used environmental voluntary disclosure (Blacconiere & Northcut, 1997; Cohen, Fenn, & Konar, 1997).

Thus, a close examination of research findings is critical for furthering knowledge in this area. This meta-analysis aims to gain further insights into corporate environmental practices implications on CFP. The profitability of these environmental strategies is not obvious since they involve significant investments in order to measure the pollution, or important modifications of the manufacturing process in order to reduce energy consumption or to use renewable instead of fossil sources of energy. These environmental investments increase production costs that cannot be reported in the price of these products, they thus impact negatively the companies’ margin. Otherwise, environmental proactivity can lead to a reduction in the use of toxic inputs during the manufacturing process and thus produce less pollutant products. This strategy allows companies to gain a leading position in the green product market and thereby maintain their legitimacy in the eyes of stakeholders.

Meta-analysis is a quantitative review method for standardizing and aggregating findings across empirical studies (Greenberg, 1992) that has proved to be a useful technique in many areas where multiple individual studies have yielded inconclusive and conflicting results (Damanpour, 1991). Meta-analysis is a set of statistical techniques that has been developed to identify and quantify associations drawn from an existing body of literature (Hunter & Schmidt, 1990; Stanley, 2001; Wolf, 1986). It determines whether differences in results are primarily due to differences in research setting, measurement scale, CFP ou CEP variables or sampling error. This technique enables clearer and more consistent conclusions to be drawn for past research by systematically bringing about commonalities which are not possible using descriptive analysis. By statistically aggregating results across individual studies and correcting statistical artifacts, such as sampling error and measurement error, meta-analysis allows for much greater precision than other forms of research review (Hunter, Schmidt, & Jackson, 1982).

The specific objectives of this meta-analysis are to: 1) provide a statistical integration of the accumulated research on the relationship between CEP and CFP; 2) assess the relative predictive validity of NRBV theory on this relationship; and 3) examine the effect of moderators, such as the operationalization of CEP and CFP, environmental strategies,
industry context and time period. This meta-analysis includes organizational measures of CFP in addition to accounting and market return, and includes an environmental proactivity measure of CEP in addition to disclosure environmental reporting. It also responds to Orlitzky et al (2003) calling for research on CEP as a Corporate Social Performance measure. By integrating empirical results across different study contexts, it enables us to explore theoretical moderators and statistical artifacts that might explain the inconsistent results across previous research.

The remainder of the paper is organized as follows: The following section reviews the background literature on the overall relationship between CEP and CFP, presents the hypotheses of this research and outlines the influence of possible moderators. Next, the meta-analysis technique, the procedures used in this paper and the results of meta-analytic investigation are provided. Finally the theoretical and managerial implications resulting from the findings are discussed and the limitations and the recommendations for future research are presented.

THEORY AND HYPOTHESES

Overall CEP and CSP relationship

As argued by Porter and van der Linde (1995a), pollution is a form of economic waste as harmful substances or energy forms are discharged into the environment. Pollution is a sign that resources have been used incompletely, inefficiently or ineffectively during the manufacturing process. Resource inefficiencies are obvious in a company which has an insufficient material utilization and poor process controls. It results in unnecessary waste, defects and stored material. Most of the first environmental improvement efforts have focused on pollution measure using end of pipe techniques that make possible the reporting of the toxic and hazardous emission during the manufacturing process. Being aware of their level of pollution, some companies have tried to control and reduce it, embracing the concept of pollution prevention. It appears to save the cost of installing and operating end of pipe pollution control techniques and increases productivity and efficiency: less waste means a better utilization of inputs resulting in lower raw material and waste disposal costs (Schmidheiny, 1992; Young, 1991). After having constrained companies to report their pollutant emissions, regulators have challenged them to reduce their pollution. Thus,
Proactive strategies offer the potential to cut emissions below the level required by law, reducing the firms’s compliance and liability costs (Rooney, 1993). Furthermore, Hart (1995) predicts that, due to increasing awareness of constraints imposed by the natural environment, pollution prevention, product stewardship, and sustainable development will increasingly be a source of competitive advantage. There are at least two types of competitive advantage - cost advantage and differentiation advantage - that can emerge from environmental strategies. Cost advantage results from environmental production processes that include redesigning production to be less polluting using energy-saving appliances or manufacturing process (Ashford, 1993; Dechant & Altman, 1994; Porter & van der Linde, 1995a). Such practices are intended to reduce the production cost by increasing the efficiency of production processes and reducing input and waste disposal costs (Hart, 1995; Shrivastava, 1995; Stead & J.G., 1996). Differentiation advantage results from best practices of environmental management that focus on product characteristics and the product market. These product-focused aspects include redesigning packaging and products in more environmentally responsible ways, developing new environment-friendly products that can be sold at a higher price, which results in higher revenues (Dechant & Altman, 1994; Reinhart, 1999; Stead & J.G., 1996).

H1: Corporate Financial Performance is positively associated with Corporate Environmental Performance across a variety of industry and study contexts.

Pro-Environmental Strategies and CFP

Academic research has often pointed out that pro-environmental strategies range from ‘non-compliance’ or ‘deny’ to ‘compliance’ or ‘concerned citizen’, and finally to ‘excellence’ or ‘proactivist’ (Christmann & Taylor, 2002; Hart, 1995; Hunt & Auster, 1990; Montabon et al., 2007; Nadler, 1998) A ‘deny’ strategy reflects a less aware attitude than ‘compliance’ or ‘tolerance’ strategy. It is pursuing environmental policies to a minimum level, in order to avoid legal penalties or lost market share. To satisfy government and stakeholder requirements, companies implement environmental reporting that indicates air, water and land pollution resulting from the manufacturing process. The first goal of the compliance strategy is to measure the emission level and to control it by ‘end of pipe’ techniques. Hence, in a compliance strategy environmental performance is measured by pollution control indexes or negative externality
indicators reported, for example, in the Toxic Release Inventory (TRI) database from the US Environmental Protection Agency (Cordeiro & Sarkis, 1997; Dooley & Lerner, 1994; Freedman & Patten, 2004; Hamilton, 1995; Hart & Ahuja, 1996; King & Lenox, 2001, 2002; Sarkis & Cordeiro, 2001).

The ‘concerned citizen’ strategy (Hunt & Auster, 1990) and ‘accommodative’ strategy (Christmann & Taylor, 2002) focus on reducing waste and toxic emissions, reducing and recycling solid waste, conserving energy and other natural resources and reducing business impact on ecosystems. Companies intend to go further than regulators’ requirements, implementing a voluntary environmental program. In this strategy, environmental performance is often measured by a pollution prevention program such as environmental objectives and progressions rather than an ‘end of pipe’ control measure.

The ‘proactivity’ or ‘environmental leader’ last stage of pro-environmental strategies see companies becoming aware of the potential for business advantages offered by the environment. They have implemented Environmental Management System (EMS), often certified ISO 14001, developing emerging capabilities such as waste minimization, green product design, and product stewardship (Ann, Zailani, & Wahid, 2006; Hart, 1995; Melnyck, Sroufe, & Calantone, 2003). These strategies allow cost and differentiation advantages that involve higher revenues for the firms reducing the cost of production or the amount of sales.

To study these ‘proactive’ strategies, researchers often use organizational indicators to measure environmental performance, such as ‘environmental best practices’: voluntary involvement in 33/50 program (Khanna & Damon, 1999), the amount of environmental investments (Mahapatra, 1984), part of output realized with less polluting production processes (Hassel et al., 2005; Sharma & Vredenburg, 1998).

*H2: A proactive environmental strategy will be more positively correlated with Corporate Financial Performance than a compliance strategy.*
Environmental Disclosure and CFP

Institutional theory argues that organizations try to enhance or protect their legitimacy (Scott, 1995) by conforming to the expectations of institutions and stakeholders (Aldrich & Fiol, 1994; DiMaggio & Powell, 1983). Moreover, legitimacy theory posits that organizations continually seek to ensure that they operate within the bounds and norms of their respective societies. These shareholders’ expectations force firms to adopt managerial practices that are expected to have high social value (Meyer & Rowan, 1977). Firms in polluting industries are all subject to increasing regulatory requirements. They have to face intense media attention, growing community concerns and changes in consumer preferences. Therefore, companies in a strong institutional field will gain legitimacy by exhibiting good environmental performance (Bansal, 2005; Bansal & Clelland, 2004). As argued by Deegan and Rankin (1996), if an organization cannot justify its legitimacy, the community may revoke its ‘licence to operate’. An increase in environmental legitimacy brings several advantages: environment-friendly companies have better exchange conditions with partners and better access to financial resources. These increasing resources can be allocated by firms to improve environmental performance and at the same time increase their legitimacy.

Firms that limit impact on the natural environment decrease stakeholder scrutiny and reduce the risk of social sanctions (Oliver, 1991). Legitimacy theorists (Lindblom, 1994; O'Donovan, 1999; Patten, 1991, 1992) argue that companies use environmental disclosure as a tool to address their exposure to social and political pressures. As proposed by Blacconiere and Patten (1994), firms with more extensive environmental disclosure in their financial reports experienced a less negative market reaction to bad environmental events such as Bhopal’s chemical leak. Environmental disclosure is a positive signal concerning a firm’s exposure to regulatory cost. Higher extensive environmental reports disclose more information to shareholders and financial partners about the future regulatory cost that companies will have to face (Blacconiere & Northcut, 1997).

H3: Environmental disclosure is positively correlated with Corporate Financial Performance.
Organizational Performance as a measure of CFP

Financial performance is a meta-construct emphasizing profitability and growth of the firm. To measure this construct, numerous environmental studies have often used accounting-based or market-based measures and some studies have used more specific measures such as competitive advantage. Accounting-based indicators often use earnings per share (EPS), return on equity (ROE), return on assets (ROA) (Russo & Fouts, 1997), return on sales (ROS) (Hart & Ahuja, 1996), return on investment (ROI) (Khanna & Damon, 1999) to measure the financial performance of the firm. ROA and ROE are generally accepted standard measures of financial performance found in strategy research. In addition to ROA or ROE, Tobin’s \( q \) reflects the inherent value of the firm and the expected future gains of the firm in accordance with ‘[it] pays to be green’ studies (Dowell, Hart, & Yeung, 2000). Other studies used market-based indexes such as a price-earning ratio, market share, sales growth and profitability (Menguc & Ozanne, 2005) to underline the improvement of economic performance of the firm. These measures focus only on the economic performance of a firm without taking into account the specific consequences of pro-environmental strategies on financial performance. In fact, environmental proactive strategies involve organizational process measured by other indicators than accounting-based or market-based indexes. Cost advantage involved in pollution control equipment, (Christmann, 2000) or differentiation advantage due to ‘green product’ sales or due to a firm’s reputation enhanced by good environmental performance (Morris, 1997), are used to measure financial performance. Hart (1995) and Porter and van der Linde (1995a) have presented the argument of innovation offsets and specific capabilities developed by proactive companies. Green product innovation and environmental process innovation are seen to be good proxies for the evaluation of competitive advantage in the natural-resource-based research (Judge & Douglas, 1998).

\[ H4: \text{Among all measures of CFP, organizational performance will have the strongest positive effect in the relationship between CEP and CFP.} \]
Potential moderators of the relationship between CEP and CFP

Pro-environmental strategies are mostly implemented by industrial companies since they are concerned with toxic emissions resulting from their manufacturing process and therefore constrained by regulations to reduce pollution. Even if all industrial companies pollute to a greater or lesser degree, some firms can be responsible for environmental disasters, hazardous pollution or chemical leaks, such as Union Carbide in Bhopal in 1984 (Blacconiere & Patten, 1994). Whereas some empirical studies have explored specific industrial sectors such as manufacturing, pulp and paper, steel, oil and chemicals, other studies have collected data from the multi-industrial sector in order to allow for a generalization of the results. As a result, the difference between an industry’s study context can explain variation in the strength of the relationship between CEP and CFP.

Governments began to address environmental issues in the 1970’s with the creation of the Environmental Protection Agency (EPA) in the USA and Environment Ministries in Europe and Japan.

From 1970 to 1995, major restricting environmental laws came into effect in the USA, in Europe and Japan, constraining firms to be more and more proactive addressing increasing environmental regulation. In the USA, the Clean Air Act (1963), the first major environmental law to include a provision for citizen suits, was significantly amended in 1970, 1977 and 1990, proposing emissions trading, adding provisions for addressing acid rain, ozone depletion and toxic air pollution control. In 1980, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, named as Superfund) authorized the EPA both to identify parties responsible for the contamination of industrial sites by hazardous substances and to compel the parties to clean up the sites. The Superfund Amendments and Reauthorization Act (SARA) in 1986 made several important changes to CERCLA, increasing the funding of Superfund and providing the use of new technologies. In Japan, the government reorganized the environmental law system in 1993. The Basic Environmental Law included the restriction of industrial emissions and waste; the promotion of recycling, dealing with environmental pollution, offering relief to victims and making provision for sanctions. In Europe, the Single European Act (1986) marked the beginning of a prominent role for environmental protection, that has been substantially expanded by the Treaties of Maastricht (1992) and Amsterdam (1997). Sustainable development is considered to be one of the EU’s central objectives, and environmental legislation aims at improving the air and water
quality, controlling pollution, assuring the safety of chemicals, setting standards for waste disposal.

From 1996 to 2008, different initiatives from voluntary organizations or conferences addressed the environmental issue collectively and internationally, while environmental regulations were amended slightly. Firms implemented more and more Environmental Management Systems (EMS) in order to address environmental issues in a proactive way. To reduce the heterogeneity of these EMS, some voluntary organizations drew up guidelines to certify the efficiency of these EMS such as the ISO 14001 certification (1996), the Global Reporting Initiative (GRI-1997), and the Eco-Management and Audit Scheme (EMAS-2001). Major international treaties aimed to achieve the stabilization of greenhouse gas concentration to prevent climate change. The Kyoto Protocol (1997) signed by 191 states entered into force in 2005 and targeted greenhouse gas reduction by 5.2% by the year 2012. While they did not sign the Kyoto Protocol, the USA implemented a less restrictive program (Clear Skies and Global Climate Change) to progressively reduce greenhouse emissions. Regulations were amended slightly in Europe (2002, creation of the Emissions Trading System), in Japan (2001, creation of a fully fledged Ministry of the Environment), and in France (2001, New Economic Regulations on Environmental Reporting). Thus, the observation date and the geographic area of the studies can explain the difference in the results of the relationship between CEP and CFP.

**H5: Possible moderators influencing the relationship between CEP and CFP are different country studies, different industrial sectors and dates of observation studies.**

As argued by Hart (1995), a framework of three interconnected environmental strategies: pollution prevention, product stewardship and sustainable development can increase significantly the CFP. Through pollution prevention, companies save the cost of installing and operating end-of-pipe pollution control investments and increase productivity and efficiency (Schmidheiny, 1992). As pollution is a sign of inefficient utilization of inputs, reducing it can lead to decrease the outputs’ production cost (Young, 1991). Pollution prevention can also result to simplify the manufacturing process and therefore enhance the efficiency and the profitability of the firm. Porter (1995) argued that stringent regulation can produce greater environmental innovations than lax regulation. As environmental regulations force companies to report their toxic and hazardous emissions, firms can measure the environmental improvement they have to do for reducing the pollution they are responsible for. Relatively
soft regulation can be met with ‘end of pipe’ investments, otherwise more stringent regulation need numerous environmental solutions like modifying manufacturing process and creating more environment-friendly product. Furthermore, during the transition period to innovation-based solutions, stringent regulation ensures that one company cannot gain position by avoiding environmental investments. Through product stewardship, firms can minimize the life-cycle environmental costs of their product systems. To achieve this goal, designers have to reduce the use of toxic or nonrenewable materials and replace them by environment-friendly resources. Hence, these products have a low environmental impact and are easily composted, reused or recycled at the end of their life. The market of ‘green product’ is currently increasing, and firms offering this kind of product have a real competitive advantage as the first mover in this market (Hart, 1995). Therefore, these ‘green’ companies are in position of establishing rules, regulations or standards in this market for years before competitors can compete with them (Porter & van der Linde, 1995). Firms that have implemented proactive strategy avoid compliance cost as they participate in the regulation process as experts. Thus, for all these reasons, proactive environmental strategies can enhance profitability and cash flow of environmental-friendly firms.

H6: Proactive strategy moderate the relationship between CEP and CFP.

METHODS

Meta-analysis is a set of statistical techniques that have been developed to identify and quantify associations drawn from an existing body of literature (Hunter & Schmidt, 2004; Stanley, 2001; Wolf, 1986). Meta-analysis is a quantitative method that allows a rigorous integration of findings of previous studies on a particular topic in order to assess the overall effect of the existing studies and to evaluate the effect of different data characteristics on results (Hunter & Schmidt, 1990; Rosenthal, 1991; Wolf, 1986). Meta-analysis involves statistical analyses which reveal associations or relationships that are less obvious in other approaches used to summarize research. Consequently, this research method is approriate to investigate the relationship between CEP and CFP, as (1) it will compute an estimate of the mean effect size for this hypothesized relationship on the basis of all available prior studies, (2) test for the significance and generalizability of the discovered mean effect size by computing its confidence interval, (3) assess whether there is heterogeneity in the effect size.
distribution and, if heterogeneity is found, (4) investigate and model this heterogeneity through further moderator analyses (Hedges & Olkin, 1985; Lipsey & Wilson, 2001)

**Sample and coding**

In order to construct a comprehensive database, computer searches were conducted on different combinations of keywords (environmental performance / disclosure / strategy / compliance / regulations, pollution, green marketing, financial performance, profitability, corporate social performance … ) on ScienceDirect, EJS Ebsco, EconLit, JSTOR, Emerald, SSRN, AoM, and Cairn databases. In addition, rigorous manual searches were also performed to identify additional articles using the reference lists of each study collected. We also consulted the major academic journal that publishes this kind of research. To be included in this meta-analysis, econometric studies needed to provide a statistical measure of the relationship between environmental performance or environmental disclosure and financial performance. Meta-analysis requires statistically independent samples (Cheung & Chan, 2004; Hunter & Schmidt, 2004). As a result, studies based on the same data-set are excluded from this meta-analysis to avoid the ‘over-representation’ bias. This meta-analysis does not include studies that do not provide enough data to calculate a common measure of ‘effect size’ or use very different statistical research methods, such as results from logit or probit regression or multivariate analysis (Doucouliagos & Laroche, 2003; Hunter & Schmidt, 2004). Event studies are not comparable as they study the reaction of the stock market value due to a specific event, such as environmental disclosure, and they do not conduct econometric analysis that controls the relationship between CEP and CFP. As argued by Hart (1995), pro-environmental strategies are usually implemented over a relatively long period of time, because specific organizational capabilities are needed. Some important manufacturing process modifications often result from the environmental proactivity of the firm. Pro-environmental strategies are expected to influence CFP positively or negatively after a few years and cannot be considered as ‘events’. Their financial consequences cannot be measured over a « disclosure event ». Hence, for reasons of comparability, we chose to exclude the probit and event studies from our meta-analysis.

These searches yielded a total of 52 independent studies from 1975 to 2011 that explored the relationship between CEP and CFP. Appendix A lists the studies included in the meta-analysis. Data coding has focused on several sample and design characteristics such as the date of observation study, country (United-States & Canada, Europe, and rest of world), industrial context (multi-industrial sector, pulp & paper, manufacturing, steel, oil & petrol),
CEP measurement (pollution externalities, prevention pollution, proactive strategy, environmental disclosure), CFP measurement (accounting-based measure, market-based measure, organizational-based measure, abnormal variation of stock value).

The principal unit of analysis in meta-analysis is the individual study (Hedges & Olkin, 1985). Since some studies contain measurements of several focal effects and as some studies report more than one sub-relationship within a given focal effect, the total number of effect sizes exceeds the number of studies. The two general approaches for dealing with multiple measurements within studies are (1) using the complete set of measurements and treating them as independent and (2) representing each study by a single value. Monte Carlo simulations have shown that meta-analytical procedures using a complete set of measures from each study outperform single-value approaches (Bijmolt & Pieters, 2001). The results of the meta-analysis will be too conservative and underestimate the degree of generalizability across studies (Hunter & Schmidt, 2004). Consequently, from the 52 studies, we extracted information on the 205 effect-sizes, sample sizes, statistical artifacts, and moderator variables.

**Meta-analytic procedures:**

Our meta-analysis uses Hunter and Schmidt’s (1990) statistical aggregation techniques for cumulating correlations and correcting for various study artifact in order to estimate the common measure of effect-size between CEP and CFP. In the meta-analysis literature, the term effect size is used to denote the magnitude of the relationship between the dependent variable (for example, CFP) and a specific independent variable (industrial context, CEP measurement, CFP measurement, country, date of observation … ). In this study, the $r$ statistic is computed to determine the effect size for each pair of variables from each study. Whenever a study reported the $r$ statistic, that is, a coefficient of correlation between CEP and CFP, it is used as a measure of effect size. When the $r$ statistic was not reported, but other statistics transformable into $r$ statistic were presented, formulas given by Rosenthal (1991) or Wolf (1986) were used to transform $t$-test, $Z$-test into an $r$ statistic.

Following Hunter and Schmidt (1990), for each association between CEP and CFP, we first calculate the weighted mean correlation coefficient ($\bar{r} = \sum N_i r_i / \sum N_i$), the total observed variance ($S^2_r = \sum N_i (r_i - \bar{r})^2 / \sum N_i$) and the sampling error variance ($S^2_e = (1 - \bar{r}^2) k / \sum N_i$), where $N_i$ is the number of observations in each sample, $r$ the effect size for sample $i$, and $k$ the number of effect sizes.

In order to determine whether the empirical correlations are homogeneous, we use two tests: (1) the 75 % rule according to which, if 75% of the observed variance across studies can be
explained by sampling errors, we can conclude that the association is considered unmoderated and homogeneous (Pearlman, Schmidt, & Hunter, 1980); and (2) a Chi-square test to assess the significance of the null hypothesis \( H_0: \rho = 0 \) (Hunter & Schmidt, 1990). In addition to estimating the measure of an effect size, meta-analytical procedures facilitate the determination of other factors influencing the relationship between those two variables. Moderators analyses are conducted by separating the samples into relevant subgroups.

To test hypothesis 6, we used meta-analytic regression (Lipsey & Wilson, 2001), a special type of weighted least squares regression analysis, designed to assess the relationship between effect size and moderator variables by modeling heterogeneity in the effect size distribution (Lipsey & Wilson, 2001). The use of a special macro published by Lipsey and Wilson prevents data analysis software from interpreting these weights as ‘representing multiple effect sizes rather than weightings of single effect sizes’ (Lipsey & Wilson, 2001).

In the overall meta analysis as in all moderators meta-analyses, an effect size ‘file drawer analysis’ was performed to address the possibility of publication bias, which is that published studies will report larger and more positive effect sizes than unpublished studies. File drawer analysis addresses this issue by computing the number of additional unknown studies needed to widen the reported confidence interval enough to include zero (Hunter & Schmidt, 1990; Rosenthal, 1978). Thus, the file drawer can be interpreted as an indication of the stability of the relationship.

RESULTS

Overall CEP-CFP relationship

Using the meta-analytical techniques described above, we investigated the relationship between CEP and CFP as well as the moderating effects on the CFP. As table 1 shows, the mean correlation of the relationship between CEP and CFP is positive (0.080) with a 95% confidence interval of (0.073 – 0.088) for the total set 205 effect sizes and a total sample size \( N \) of 63,782 observations. This holds for all different measures of CEP and all different measures of CFP, and in different industrial contexts. Furthermore, the confidence interval does not include zero, providing evidence that there is a significantly positive relationship between CEP and CFP. As shown in Table 1, 1,001 additional studies are necessary to change the overall substantive conclusions of this meta-analysis. Results of our study confirm the Meta-Analysis of Orlitzky et al (2003) which argued that the Corporate Social Performance (CSP) is positively correlated with CFP across a wide variety of industry and study contexts.
Our results are also consistent with Allouche and Laroche (2005) who found that CEP, as a measure of CSP, has a positive relationship with CFP just as all other measures of CSP. Results indicate a positive overall relationship between CEP and CFP supporting hypothesis 1.

In order to detect possible publication bias, a funnel plot was constructed with estimate on the x-basis and sample size on the y-basis. As seen in Figure 1, the funnel plot appears to be relatively symmetrical indicating little or no publication bias (Laroche, 2007; Lipsey & Wilson, 2001).

**Pro-Environmental Strategies and CFP**

The relationship between the pro-active environmental strategy and the CFP is positive (0.26 see table 2) with a 95% confidence interval of (0.24 – 0.27) for a total sample size $N$ of 12,111 observations. As the ‘interval of confidence’ does not include zero, the relationship between pro-active environmental strategy and CFP is truly positive, supporting hypothesis 2. Research has often used negative externality and pollutant emission indicators to measure the environmental performance of a compliance strategy. One of their first goals is to measure the emission level and to control it by end of pipe techniques. The relationship between a compliance strategy measured by negative externalities and pollutant emission is less positive (0.04) with a 95% confidence interval of (0.03 – 0.05) for a total sample size $N$ of 35,230 observations. As the confidence interval does not include zero, the relationship is truly positive. Environmental engagement is often used to measure the ‘concerned citizen’ strategy (Hunt & Auster, 1990) or ‘accommodative strategy’ (Christmann & Taylor, 2002) focusing on the reduction of waste and toxic emissions, reducing and recycling solid waste, conserving energy and other natural resources, or participating voluntarily in environmental programs. The relationship between environmental engagement and CFP is weakly positive (0.03) with a 95% confidence interval of (0.01 – 0.011) for a total sample size $N$ of 12,827 observations. To conclude, the relationship between CEP and CFP is more positively correlated for ‘proactive environmental strategy’ than for ‘compliance and ‘environmental engagement’ supporting H2.
Environmental Disclosure and CFP.
The relationship between the environmental disclosure and the CFP is positive (0.04) with a 95% confidence interval of (0.01 – 0.08) for a total sample size $N$ of 3,614 observations. As the confidence interval does not include zero, the relation is positive, supporting Hypothesis 3.

Organizational Performance as a measure of CFP
As Table 2 shows, the CFP measured by organizational indicators is positively influenced (0.13) by CEP with a 95% confidence interval of (0.12 – 0.15) for a total sample size of 21,433 observations partially supporting hypothesis 4. However, the CFP measured by accounting based indicators is the most positively correlated (0.25) with a 95% confidence interval of (0.22 – 0.27) for a total sample size $N$ of 6,017 observations. Nevertheless, as the confidence interval of these two CFP indicators does not include zero, the relationship is truly positive. The CFP measured by stock price variation is the less influenced by CEP as its estimate is 0.011 with a 95% confidence interval of (-0.03 – 0.05) for a total sample size $N$ of 2,339 observations. As the confidence interval includes zero, we cannot conclude that the relation is truly positive. We can observe that market based measure of CFP is the less positively influenced by CEP (0.02) with a 95% confidence interval of (0.01 – 0.03) for a total sample size $N$ of 33,993 observations. This data confirms the Orlitzky et al (2003) results that found that accounting measures were more highly correlated with CSP than market-based measures.

Moderating effect.
As Table 2 shows, the relationship between CEP and CFP is deeply influenced by moderating factors considering the unexplained variance of this meta-analysis for the overall relationship (0.89) and for each hypothesis. The results indicate that moderating factors significantly influence CEP and CFP relationships examined in this study, supporting hypothesis 5. To test the moderating effects, we proceeded by sub-grouping the studies according to their coded research contexts, then we compared the combined effect size that are calculated within each group.
First of all, there is a significant difference between the results of the analysis in USA-Canada and Europe. The relationship between CEP and CFP is significantly positive for ‘USA-Canada’ with (0.07 see table 2) with a 95% confidence interval of (0.06 – 0.08) for a total sample size \(N\) of 40,725 observations. The relationship between CEP and CFP in Europe is weakly positive with (0.04) with a 95% confidence interval of (0.01 – 0.06) for a total sample size \(N\) of 6,161 observations. The relationship between CEP and CFP for the ‘Rest of World’ is higher than in Europe with (0.12) with a 95% confidence interval of (0.11 – 0.14) for a total sample size \(N\) of 16,896 observations.

Furthermore, the industrial context is an important moderating factor as Table 2 shows. The relationship between CEP and CFP is significantly positive for the ‘Chemical & oil’ sector with (0.12) with a 95% confidence interval of (0.08 – 0.15) for a total sample size \(N\) of 3,313 observations. The relationship between CEP and CFP is weakly positive for the ‘Manufacturing’ sector with (0.03) with a 95% confidence interval of (0.01 – 0.05) for a total sample size \(N\) of 9,586 observations. The ‘unexplained variance’ for this industrial context is less than 75% (0.67); thus, in this case, there are probably not many other moderating factors.

The relationship between CEP and CFP for ‘Steel industry’ sector is less positive with (0.08) with a 95% confidence interval of (0.07 – 0.09) for a total sample size \(N\) of 34,867 observations than for the ‘Multi-industrial sector’ analysis with (0.11) with a 95% confidence interval of (0.09 – 0.12) for a total sample size \(N\) of 16,016 observations.

As Table 2 shows, the date of observation studies is a moderating factor since the relationship between CEP and CFP is more significantly positive for studies whose data have been collected between 1972 and 1995 with (0.08) with a 95% confidence interval of (0.07 – 0.09) for a total sample size \(N\) of 19,041 observations. The relationship measured in the second period of time is less positive with (0.08) with a 95% confidence interval of (0.07 – 0.09) for a total sample size \(N\) of 44,741 observations for studies whose data have been collected between 1997 and 2008. The relationship between CEP and CFP for non-longitudinal studies is more positive (0.13) with a 95% confidence interval of (0.01 – 0.11) than those of longitudinal studies (0.06) with a 95% confidence interval of (0.01 – 0.04). As shown in table 3, the results support hypothesis 6. The environmental proactive strategy positively moderates CFP. Investments in environmental practices enhance profitability and cash flow of the firms through reduced costs of regulatory compliance, lower waste disposal, energy and material savings.
DISCUSSION

The goal of this meta-analysis was to critically examine the relationship between CEP and CFP within a large sample of studies. The study’s results provide overall evidence of a significantly positive relationship across different industry and study contexts consistent with hypothesis 1.

Results suggest a stronger relationship between CEP and CFP for organizations that have implemented a ‘proactive environmental strategy’ than for companies with a ‘compliance strategy’ and ‘environmental engagement’. Environmental regulations have often been viewed as weak for competitiveness, because prevention investments and clean-up costs could lead to product price increase. Regulation has first focused on control and measurement of pollutant emissions generated by industrial activities, and as this meta-analysis has shown, a ‘compliance strategy’ measured by negative externalities and pollution indexes are weakly positively correlated with CFP. In recent decades, regulation has concentrated on the production of more environment-friendly products by industrial companies. They have limited the use of hazardous material in output or during the production process. This change of regulation focus has triggered environmental innovations to face the increasing pressure of law, customers and competitors (Porter & van der Linde, 1995a). Many industrial companies have invested in successful incremental green innovations. These include the increasing use of existing key dimensions of green products such as eco-efficiency (e.g., incremental improvement of fuel efficiency in vehicles), substitution of conventional materials by those with a lower environmental impact (e.g., replacement of virgin materials with recycled ones), or the design of recyclable products (e.g., designed for disassembly). Other companies have invested in successful radical green product innovations: These include the use of new technologies (e.g., hybrid or hydrogen vehicles) or the replacement of one critical component with a completely new one that significantly reduces the overall environmental impact of the product. (Dangelico & Pujari, 2010). Moreover, companies anticipating the direction of future environmental regulations have been more likely to seize opportunities to introduce environmental improvements before their competitors (Dechant & Altman, 1994).
Companies introducing green products and environment processes that result in a cleaner environment often set the benchmark for future regulations.

As table 2 shows, the relationship between CEP and CFP is more positive during the 1972-1995 period, when governments implemented restrictive environmental regulations that encouraged firms to reduce their pollution and at the same time to reduce waste and inefficient uses of inputs during the manufacturing process. During the 1996-2008 period, national environmental regulations were less numerous, treaties and conferences addressed the issue internationally, and the relationship between CEP and CFP is less positive. Thus CEP is more significantly positively associated with CFP in a context of institutional pressures that force firms to improve their CEP and consequently their CFP. Environmental regulations that focus on the reporting of pollutant and toxic emissions make companies understand the full costs of the incomplete utilization of resources during the manufacturing process. These regulations encourage firms to be more aware of pollution and conceive new approaches to minimize discharges and eliminate hazardous substances. Relatively lax regulation can be met by firms without environmental innovations and often with ‘end of pipe’ solutions. However, more stringent regulations encourage firms to pay greater attention to discharges and toxic emissions. To be compliant with these stringent regulations, companies must find more fundamental solutions like reconfiguring products and processes (Porter & van der Linde, 1995b).

As shown in table 3, organizational performance is a positively associated measure of financial performance in the relationship between CEP and CFP. Firms that have implemented a proactive environmental strategy need to develop particular organizational capacities within an EMS, often ISO 14001-certified. This type of environmental management deeply transforms the organization, modifying the manufacturing process, integrating environmental management into day-to-day operations. Environmental performance improvement becomes an objective of a firm’s strategy just as financial profitability is. The goal of an environmental-proactive strategy is to significantly reduce pollution through well-defined environmental objectives rather than just control emissions through ‘end-of-pipe’ investments. This kind of strategy is ‘people intensive’ and depends on tacit skill development through employee involvement (Hart, 1995). The life-cycle analysis of products needs close working relationships between environmental, marketing and manufacturing departments. Product stewardship implies an organizational ability not only to coordinate these departments in the firm, but also to integrate the point of view of external stakeholders –environmentalists, community leaders, media, regulators- into decisions about
product development. Thus moving up the ‘Green Stairway’ from ‘Denial’ to ‘Sustainable Competitive Advantage’ has allowed companies to be leaders on green market products and obtain a competitive advantage by producing goods at a lower cost due to pollution reduction (Nadler, 1998). As shown by this meta-analysis, environmental investments, even expensive ones, are worth making insofar as proactive strategies are more positively correlated with CFP than other environmental strategies. Firms developing these resources both address the constraints imposed by the natural environment, and capture the opportunities offered by it. They are likely to yield higher performance.

Furthermore, as shown by this meta-analysis, environmental disclosure is positively correlated with CEP, consistent with hypothesis 3. Many industrial companies have published voluntary annual environmental reports detailing emissions, spills, accidents, fines and penalties as well as their improvements in pollution prevention. Managers have used environmental disclosure to maintain or increase the legitimacy of their firms, in order to reassure stakeholders and make them approve their activities since the stock market reactions seem to be positively linked to this kind of disclosure, confirming results of Cormier et al (2004) or Cho and Patten (2007) or Aerts et al (2009). Good environmental performers disclose more pollution-related environmental information than do poor performers, thus firms often use voluntary disclosure to project a proactive environmental image by providing ‘green washing’ information regarding their environmental performance. Due to increased regulatory costs, some pollutant firms have an overall negative reaction to announcements of specific environmental legislative actions. Thus, firms with more extensive disclosures have a less negative reaction to the legislative announcements. Further, firms with more extensive prior environmental disclosures in their financial reports experienced a less negative market reaction to the Bhopal chemical leak. Firms tend to disclose ‘good news’ and suppress ‘bad news’ concerning their exposure to environmental risk, thus investors may interpret these disclosures as a positive signal concerning the firm’s exposure. In response to the strengthening of environmental regulations during the years 1972-1995, firms have significantly increased their environmental disclosure in order to minimize the market reactions or maintain their legitimacy.

As table 2 shows, the relationship between CEP and CFP is more positive in non-longitudinal studies than in longitudinal studies. During the first years of a proactive strategy, environmental performance improves significantly and quickly, with large reductions of pollutant emissions involving a decrease in the manufacturing cost. The early stage of proactive environmental strategy is based on investments that measure, control and reduce
pollution. However, the proactive environmental strategies are implemented over a long period of time and, as the firm’s environmental performance improves, further reductions in pollutant emissions become progressively more difficult to obtain (Hart & Ahuja, 1996; Rooney, 1993). Further stages of proactive environmental strategy often require significant changes in manufacturing processes or, possibly new environment-friendly production technology. Moreover, the profitability of these further stages of environmental strategy depends on higher financial and physical assets as well as employees’ skills and organizational processes (Hart, 1995). As a result, the highest environmental and financial performances generated by first years of proactive environmental strategy are mixed with lower environmental and financial performance of the following years in a longitudinal study.

**Theoretical Implications**

Our meta analysis answers the question ‘Does it pay to be green?’ affirmatively (Hart & Ahuja, 1996) and shows that ‘Proactive environmental strategy’ is more significantly positively correlated with CFP than ‘Compliance strategy’ than with ‘Environmental engagement’. Results confirm the Natural-Resourced-Based View theory suggesting that firms can improve their profits by implementing a proactive strategy. As Porter’s (1995a) ‘win-win’ hypothesis is confirmed, companies can be ‘Green and Competitive’. Pollution really seems to be a kind of economic waste and reducing it can enhance resource productivity making companies more competitive. Our meta-analysis confirms that properly designed environmental standards can trigger innovations that lower the total cost of the product or improve its value and enhanced resource productivity, making companies more competitive, not less (Porter & van der Linde, 1995a)

Overall results of this meta-analysis reject notions developed by neo-classical economists that CEP, as a part of CSP, is necessarily inconsistent with shareholders’ wealth maximisation (Friedman, 1970). All of CEPs’ measures used in our study are positively correlated with CFP, confirming that different kinds of pro-environmental strategies implemented by firms do not minimize the profit for companies and shareholders. Companies implementing a pro-environmental strategy can maximise the interests of both stakeholders and shareholders.
Managerial Implications

As market forces generally do not penalize companies which have high levels of CEP, managers can afford to care about the environment. They may be more likely to pursue CEP as a part of their strategy for increasing CFP. Strategic leaders need to legitimize environmental issues as an integral part of corporate identity, allowing managers time and resources they can apply at their discretion to manage the environmental issue (Sharma, 2000). A high allocation of investment in environmental technologies towards pollution prevention, product stewardship and life cycle analysis is necessary. To make such investments, firms must develop strategic organizational resources to enable recognition and deployment of environmental strategy at plant level (Klassen & Whybark, 1999). The adoption of innovative environmental technologies would be enhanced if managers interpreted environmental issues as opportunities rather than as threats (Delmas et al., 2011; Sharma, 2000). A clear and fully integrated environmental strategy should not only guide competency development, but also shape the company’s relationship to customers, suppliers, other companies, policymakers, and all its stakeholders.

Knowledge, practices, systems and routines at the business and natural environment interface must be enhanced to increase proactive strategy results on both economic profit and environmental protection. To attain this goal, environmental departments must play a major role in developing environmental awareness across the organization. Training on an ongoing basis can help employees to address new regulations and community concerns. Educated employees can be a source of innovative ideas in pollution prevention technology and processes (Dechant & Altman, 1994). Taking a strong stand in acquiring, assimilating, transforming and exploiting knowledge seems a valuable precondition to realize benefits from a proactive environmental strategy (Delmas et al., 2011). As argued by Sharma et al (1999) organizations creating a context within which their employees are influenced to embrace environmental issues as opportunities, stand to realize significant benefits from a number of sources – lower costs of input materials, higher process efficiencies, lower energy use, waste re-use and recycling, differentiated products, and higher levels of corporate reputation and goodwill. Companies often consider environmental issues as strictly the environmental department’s job and not as an inherent part of every employee’s job. To change this way of thinking, companies can calculate the
incentives of their operational managers on, among other things, how well they meet environmental goals (Dechant & Altman, 1994).

Limitations
The results of this study need to be interpreted with caution. First, CFP and CEP are meta-constructs which can be operationalized in a variety of ways. The ‘estimate’ calculated in this meta-analysis depends on the researchers’ choices of CEP and CFP measures and on their theoretical meaningfulness. Furthermore, this ‘effect size’ is calculated from different studies, countries, periods, operational definitions used in measuring the explanatory variables, and from a wide variety of research methods. This heterogeneous analysis is often criticized in meta-analysis studies (Laroche & Schmidt, 2004). Despite these limitations and concerns, meta-analysis is a well established social science technique for aggregating test statistics, and the inclusion criteria used in this paper are consistent with the literature.

Furthermore, some CEP indicators are operationalized in a heterogeneous manner as for ‘Environmental engagement’. Some of these studies measured the improvement of environmental performance through the participation of the companies in different programs that aim to reduce pollution over a long period of time, and sometimes in a voluntary way, such as the 33/50 program. These studies take place over a longer period of time than studies which examine the companies’ pollutant emissions over one year. Results of ‘Environmental engagement’ are often calculated over a few years thus the CEP can be impacted by the growth of the firm that results in an increase of pollutant emissions even if this company participates in a voluntary environmental program to reduce pollution caused by its activity.

Conclusion
Our meta-analysis has shown an overall positive relationship between CEP and CFP, across studies in the industrial sector. Results show that a proactive environmental strategy is more positively correlated with CFP than compliance strategy. Furthermore, environmental disclosure is positively correlated with CFP. Different industrial sectors and the date of observation appear to be some important moderating factors of the relationship. This meta-analysis clarifies the relationships between CEP and CFP and assesses the relative predictive validity of NRBV theory in this context.

Our meta-analysis results suggest that not all CEP dimensions are influenced by the same factors and that CEP dimensions do not affect financial performance in a similar manner. Rather, environmental strategies vary from compliance, to legitimacy, to proactivity. These
different environmental strategies affect the CFP in different ways and future research should consider the timing of their implementation in order to verify if their effects are simultaneous on CFP. Are companies compliant with regulations in the first stage before disclosing more environmental information to maintain their legitimacy, and finish by implementing proactive environmental strategy to improve their profitability? It seems that ‘compliance strategy’ has less effect on CFP than ‘proactive strategy’ and the profitability of an environmental strategy seems to be higher in the short term. Thus, future research should verify the impact of these different environmental strategies on CFP over a longer period of time in order to show the progressiveness of their financial consequences, and further of their organizational capabilities. A proactive environmental strategy impacts differently on companies: manufacturing process modification, environmental innovations, specific capabilites, tacit skills, competitive advantage … These organizational transformations are difficult to measure and future research should consider these different aspects of financial performance. Future research could also usefully consider the development of this relationship over time and in the institutional context to clarify the causal structure of the relationship between CEP and CFP.
Bibliographie


TABLE 1
Overall Meta-analytic findings

<table>
<thead>
<tr>
<th>title</th>
<th>K</th>
<th>N</th>
<th>estimate</th>
<th>sd</th>
<th>CI 95%</th>
<th>chisq</th>
<th>p</th>
<th>star</th>
<th>Exp var</th>
<th>Unexp var</th>
<th>File Drawer</th>
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<tr>
<td>Correlations-based</td>
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<td>0.00</td>
<td>0.07/0.08</td>
<td>545.43</td>
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<td>***</td>
<td>0.10</td>
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<tr>
<td>Partial</td>
<td>52</td>
<td>16,763</td>
<td>0.07</td>
<td>0.01</td>
<td>0.05/0.08</td>
<td>123.69</td>
<td>0</td>
<td>***</td>
<td>0.14</td>
<td>0.85</td>
<td>1001</td>
</tr>
</tbody>
</table>

K= Number of effect-sizes; N= total sample size; estimate = weighted mean correlation coefficient;

FIGURE 1
Funnel plot of included studies
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<tr>
<th>Moderator</th>
<th>K</th>
<th>n</th>
<th>Mean</th>
<th>Std wavg</th>
<th>lower</th>
<th>upper</th>
<th>chisq</th>
<th>p</th>
<th>star</th>
<th>Exp var</th>
<th>Unexp var</th>
<th>U</th>
</tr>
</thead>
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<tr>
<td>Proactive strategy</td>
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<td>12,111</td>
<td>0.26</td>
<td>0.01</td>
<td>0.24</td>
<td>0.27</td>
<td>254.61</td>
<td>0</td>
<td>***</td>
<td>0.08</td>
<td>0.91</td>
<td>1,129.31</td>
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<td>Compliance</td>
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<td>35,230</td>
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<td>0.03</td>
<td>0.05</td>
<td>138.65</td>
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<td>0.21</td>
<td>0.79</td>
<td>353.88</td>
</tr>
<tr>
<td>Envtal Engagmt</td>
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<td>0.01</td>
<td>0.01</td>
<td>0.05</td>
<td>108.49</td>
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<td>0.86</td>
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<td>47</td>
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<td>170.91</td>
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<td>***</td>
<td>0.08</td>
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<td>0.17</td>
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<td>Org fin perf</td>
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<td>162.68</td>
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<td>511.56</td>
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<td>CAR</td>
<td>22</td>
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<td>0.01</td>
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<td>0.05</td>
<td>39.46</td>
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<td>0.25</td>
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<td>Envtal disclosure</td>
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<td>3,614</td>
<td>0.05</td>
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<td>0.08</td>
<td>43.34</td>
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<td>0.25</td>
<td>0.75</td>
<td>100.17</td>
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<td>USA Canada</td>
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<td>40,725</td>
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<td>0.01</td>
<td>0.06</td>
<td>0.08</td>
<td>352.03</td>
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<td>0.13</td>
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<td>1,346.32</td>
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<td>Europe</td>
<td>31</td>
<td>6,161</td>
<td>0.04</td>
<td>0.01</td>
<td>0.01</td>
<td>0.06</td>
<td>43.63</td>
<td>0.0</td>
<td>5</td>
<td>*</td>
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<tr>
<td>Rest of world</td>
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<td>0.01</td>
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<td>0.14</td>
<td>149.62</td>
<td>0</td>
<td>***</td>
<td>0.04</td>
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<td>Multi sector</td>
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<td>16,016</td>
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<td>0.01</td>
<td>0.10</td>
<td>0.12</td>
<td>192.56</td>
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<td>***</td>
<td>0.13</td>
<td>0.87</td>
<td>681.41</td>
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<td>Manufact</td>
<td>58</td>
<td>9,586</td>
<td>0.03</td>
<td>0.01</td>
<td>0.01</td>
<td>0.05</td>
<td>89.22</td>
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<td>0.33</td>
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<td>Steel industry</td>
<td>48</td>
<td>34,867</td>
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<td>0.07</td>
<td>0.09</td>
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<td>***</td>
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<td>Chemical Oil</td>
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<td>0.12</td>
<td>0.02</td>
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<td>0.15</td>
<td>56.50</td>
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<td>0.156</td>
<td>0.84</td>
<td>302.17</td>
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<tr>
<td>Date :72-95</td>
<td>108</td>
<td>19,041</td>
<td>0.08</td>
<td>0.01</td>
<td>0.07</td>
<td>0.1</td>
<td>248.72</td>
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<td>0.15</td>
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<td>Date :96-08</td>
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<td>296.62</td>
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<td>0.08</td>
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<td>342.46</td>
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<td>Longitudinal</td>
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<td>42,137</td>
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<td>0.05</td>
<td>0.07</td>
<td>202.87</td>
<td>0</td>
<td>***</td>
<td>0.13</td>
<td>0.87</td>
<td>871.08</td>
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### TABLE 3

Meta-analytic regression analysis results

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<thead>
<tr>
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<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
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<tr>
<td>Proactive strategy</td>
<td>3.14 (0.77) ***</td>
<td></td>
</tr>
<tr>
<td>Accounting fin perf</td>
<td>0.63 (0.12) ***</td>
<td></td>
</tr>
<tr>
<td>USA-Canada</td>
<td>3.02 (0.07) ***</td>
<td>2.34 (0.11) ***</td>
</tr>
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<td>Date : 72-95</td>
<td>-0.14 (0.069) **</td>
<td>0.28 (0.08) ***</td>
</tr>
<tr>
<td>Constant</td>
<td>3.78 (0.046) ***</td>
<td>1.81 (0.60) ***</td>
</tr>
<tr>
<td>R²</td>
<td>0.2039</td>
<td>0.4339</td>
</tr>
<tr>
<td>k</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>QModel (p)</td>
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<td>5,471.45</td>
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<td>QResidual (p)</td>
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<td>7,138.02</td>
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*** p < .001, ** p < .01, * p < .05
### APPENDIX A
Overview of studies included in this meta-analysis

<table>
<thead>
<tr>
<th>Authors</th>
<th>Sample Size</th>
<th>Number of 𝑟 reported</th>
<th>Average effect-size : 𝑟</th>
<th>CEP Indicator</th>
<th>CFP Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Alvarez-Gil, Burgos-Jimenez, &amp; Cespedes-Lorente, 2001)</td>
<td>71-112</td>
<td>4</td>
<td>0.163</td>
<td>Seven different environmental practices</td>
<td>Profit of the year and of the last 3 years</td>
</tr>
<tr>
<td>(Al Tuwaijri et al., 2004)</td>
<td>198</td>
<td>4</td>
<td>0.237</td>
<td>Toxic Waste Recycled / Total Waste Generated and environmental disclosure in annual report</td>
<td>Industry-adjusted annual return – adjusted for dividends</td>
</tr>
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<td>(Ann et al., 2006)</td>
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