

Has the CSR engagement of electrical companies had an effect on their performance? A closer look at the environment

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ABSTRACT:

Even though electrical companies attain a top ranking in the publication of CSR reports, they are often accused of “green-washing” due to their bad environmental reputation. The current economic crisis is testing their real CSR commitment more than ever, especially when this goes beyond its economic consequences.

Based on a worldwide sample of electrical companies, we are going to study why companies are being socially responsible. We wish to know if it is due to the impact on the firms’ performance or whether there are other motives (legitimation, improving their reputation) that lead companies to carry out these practices. We will also consider if it changes across the kind of CSR actions considered.

The results show that there is an economic justification beyond the socially responsible behaviour of the electrical companies. Additionally, most kinds of CSR actions (community, diversity, corporate governance, product responsibility) are also carried out looking for economic rewards. However, the CSR actions oriented to the environment are mainly motivated by their need to improve their image and reverse their negative impact.

KEY WORDS:

CSR, financial performance, environment, electrical companies.

1. Introduction

The evolution of Corporate Social Responsibility (CSR) in terms of importance and significance over the last decades is undeniable (Schultz and Wehmeier, 2010). It has changed from being an irrelevant or fashionable idea to one of the most widely accepted concepts in the business world (Lee, 2008).

Even though carrying out CSR practices has become a *requirement to be able to operate* (Pelozo, 2006), their widespread use makes researchers consider the reasons why companies are increasingly more engaged with CSR. That is, if this is due to pure altruism or if, in contrast, they are looking for legitimacy or an economic reward according to the arguments of the Legitimacy (Deegan, 2002) and Stakeholder Theories (Freeman, 1984).

Although many researchers have tried to answer if being socially responsible has an effect on a company's performance (Orlitzky *et al.*, 2003; Allouche and Laroche, 2005; Wu, 2006; Fifka, 2013), the results found have not been totally conclusive. This is mainly due to the different approaches (linear vs non-linear), samples, and the CSR/performance measures used (Davidson and Worrell, 1990; Ruf *et al.*, 2001).

Notwithstanding, many researchers (Waddock and Graves, 1997; Margolis and Walsh, 2003) have shown the determinant role that the industry plays in this relationship. They argue that the use of cross-sectional samples could mean the compensation or overlapping of the results, and, therefore, explain the lack of general conclusions. These are based on two arguments. Firstly, the kind of CSR actions carried out by companies depends on their stakeholders' pressures. This would be similar in the case of firms from the same industry (Patten, 2002). Secondly, the opportunity to get financial outcomes from their CSR actions are likely to be determined by industry-specific factors (Endrikat *et al.*, 2014).

Despite the convenience of carrying out studies in specific industries that may clarify the relationship between CSR and Financial Performance (FP) (Griffin and Mahon; 1997; Rowley and Berman, 2000), this has not been extensively investigated in the most controversial or socially/environmentally sensitive sectors. While there are few articles focused on some of the most socially sensitive sectors, such as banks (Pérez-Ruiz and Rodríguez-Bosque, 2012; Escobar and Miras, 2013), and alcohol, tobacco and weapons (Cai *et al.*, 2012), this relationship has not been analyzed in depth in environmentally sensitive sectors.

The electric utilities have a high environmental impact derived from the generation of electricity energy (Hackston and Milne, 1996; Deegan and Gordon, 1996; Pătări *et al.*, 2012). This makes them be considered as "*a dirty sector*" (Mio, 2010; Kerckhoffs and Wilde-Ramsing, 2010). Likewise, they have a strategic and determinant role in the evolution of developed and developing economies all over the world (Sutton, 2007). Hence, we consider it interesting to

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3 study how this relationship between CSR and FP is in one of the most
4 environmentally-concerned sectors.

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6 Moreover, electrical companies have to face the dilemma of disclosing
7 information about CSR, since it could be seen such as an attempt at “window-
8 dressing” or “green-washing” (Vries *et al.*, 2013), legitimising (Deegan, 2002) or
9 improving their reputation (Melo and Garrido-Morgado, 2012), instead of being
10 a reflection of a real engagement (altruistic) with these issues.

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13 Consequently, it is crucial for researchers and society at large to know what the
14 motivations of the CSR engagement of the electricity companies are. In this
15 sense, we could study if there are economic motivations beyond their socially
16 responsible behaviour or not.

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19 Within the general debate about causality in the CSR-FP relationship
20 (Salzmann *et al.*, 2005), we are going to consider the curvilinear approach
21 (Marom, 2006; Barnett and Salomon, 2012). This is because considering the
22 high level of CSR commitment in the electrical sector (Alonso-Almeida *et al.*,
23 2013) could be a better attempt at understanding whether there is an impact of
24 CSR actions on the performance of the companies (Simpson and Kohers,
25 2002).

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28 Nevertheless, several researchers are calling into question the suitability of
29 using a single construct to measure CSR (Marom, 2006; Pelozo, 2009), since it
30 is the result of the aggregation of several unrelated aspects (Rowley and
31 Berman, 2000), such as the environment, the community, diversity,
32 employment, product responsibility, human rights and corporate governance
33 (CSR dimensions according to KLD¹). In this sense, companies from the same
34 sector are going to focus their CSR efforts on the same aspects or dimensions
35 according to their activity and their stakeholders' pressures (Patten, 2002).
36 Hence, they are pointing out the need to also study socially responsible actions
37 considering each different aspect or dimension involved.

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40 Therefore, it is important as well to analyse whether each different CSR
41 dimension has a relationship with corporate performance in order to understand
42 if the motivations for its being carried out are the same. This is especially the
43 case for environmental actions, due to the peculiarities of the electrical industry
44 already outlined.

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47 Regarding the effect of environmentally-responsible actions on corporate
48 performance, traditionally it had been negatively supported by the Trade-Off
49 hypothesis (Friedman, 1970). However, from a revisionist point of view, a
50 positive and a curvilinear relationship have been suggested (Fujii *et al.*, 2013),
51 in consideration of the Win-Win Hypothesis (Porter and Van der Linde, 1995).
52 This defends that environmentally responsible actions can produce cost savings
53 through improving the efficiency and reducing waste and risks (Lankoski, 2008).
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58 ¹ KLD (Kinder, Lyderberg and Domini Stats Database). This is one of the most accepted
59 databases for CSR measures.
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3 Therefore, this paper has a double aim. On the one hand, we would like to know
4 if the CSR actions carried out by electrical companies are looking for an
5 economic reward. On the other hand, we want to analyse whether the CSR-FP
6 relationship changes if we study each CSR dimension, in particular that which is
7 related to the environment.
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9
10 We use an international sample (26 countries) which is composed of 89
11 electrical companies indexed in the stock markets of each country. We have
12 chosen the period between 2008 and 2011 because the current financial crisis
13 provides a very good opportunity to test real CSR motivations, due to there
14 being less resources available (Ducassy, 2013). Our data are provided by the
15 ASSET4 and Datastream databases.
16

17 According to the results, we find that CSR actions have an influence on the FP
18 of the electrical companies. This is explained by a U-shaped curve. So, there is
19 an economic justification behind the highly-extraordinary behaviours although
20 standard actions are not as well rewarded. This could be because companies in
21 the electrical industry are highly committed to CSR and, consequently, they are
22 only rewarded when their behaviour is exceptional.
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25 When we study the relationship between the CSR dimensions and FP, we
26 realise that each of them shows a different impact or even no influence.
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28 In this sense, the results report that actions oriented towards the environment
29 do not show any relationship with corporate performance. This indicates that the
30 motivations for their being carried out by the electrical companies are more
31 related to their need to legitimise, to altruism or to be able to compete, although
32 the high cost of being committed to the environment cannot be forgotten.
33 Regarding the other CSR dimensions, the Community, Diversity, Corporate
34 Governance and Product Responsibility are motivated by their financial
35 rewards. However, the Employment dimension presents a lack of a relationship
36 with the FP, therefore the motives behind them are more related to their
37 concern with the current situation.
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40 The paper is organised as follows. In Section 2, we focus on the debate about
41 the different approaches that try to explain the CSR-FP relationship. In Section
42 3, we look more closely at the sample and variables used as well as the
43 methodologies employed. Section 4 presents the results of our study and the
44 discussion. Finally, in Section 5 we show the conclusions, the limitations of the
45 study and some of the lines of investigation which remain open.
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48 **2. Theoretical framework**

49

50 Although the idea that firms have some responsibilities towards society beyond
51 that of making profits for their owners has been around for hundreds of years
52 (Carroll and Shabana, 2010), only at the end of the last century did CSR
53 become a reality in business and one of the determinant factors which have
54 been taken into account in decision-making (Garriga and Melé, 2004).
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3 Given its current relevance, many researchers (Brammer and Millington, 2005,
4 Fernandez and Luna, 2007; Beurden and Gössling, 2008; Fifka, 2013) have
5 wondered whether socially responsible behaviour involves some *extra* benefits
6 apart from being able to compete in the current business environment
7 (Martínez-Ferrero *et al.*, 2013).
8

9
10 Empirical research about the relationship between CSR and FP started at the
11 beginning of the 1970s (Moskowitz, 1972). Even though almost forty years have
12 passed and there have been a large number of articles written about it, the
13 results continue being heterogeneous (Orlitzky *et al.*, 2003; Allouche and
14 Laroche, 2005; Wu, 2006). This does not allow a conclusion about the direction
15 of the causality (Salzmann *et al.*, 2005) or about the mathematical sign of the
16 relationship (Preston and O'Bannon, 1997).
17

18
19 Therefore, there has been much discussion in the literature (Davidson and
20 Worrell, 1990; Ruf *et al.*, 2001; Godfrey and Hatch, 2007) concerning what the
21 possible causes for those empirical differences are. Most researchers highlight
22 that there is not a unique theoretical framework to explain the relationship
23 between CSR and FP.
24

25
26 Since the aim of this article is to study whether their CSR actions have an
27 influence on the performance of the electrical companies, we focus on the
28 *Hypotheses* or *Theories* which try to explain them. The traditional group of
29 theories which defend the linear influence of CSR on FP (Preston and
30 O'Bannon, 1996) are: the *Social Impact Hypothesis* and the *Trade-off*
31 *Hypothesis* (Figure 1). On the one hand, the *Social Impact Hypothesis*
32 (Freeman, 1984) assumed that the coincidence between the expectations of
33 stakeholders and what the company gives them involved an increase in the
34 performance of firms. However, the *Trade-off Hypothesis* (Friedman, 1970)
35 stated that the costs of carrying out CSR actions are higher than the profits
36 produced. This is putting them at a disadvantage when compared to other firms.
37

38
39 However, according to Simpson and Kohers (2002), the linear approach fails in
40 its aim to give a complete explanation of the CSR-FP relationship, because in
41 some cases an explanation could be the *Social Impact Hypothesis* and the
42 *Trade-off Hypothesis* at the same time. This is why they revealed the need for a
43 theoretical framework which allows us to have a better understanding of this
44 behaviour.
45

46
47 In response to that demand, some researchers have focused on demonstrating
48 that there is not a linear relationship but rather one which is curvilinear (Figure
49 2). Nevertheless, there is no agreement about if it is an inverted U-shaped
50 relationship (Marom, 2006) or a U-shaped relationship (Barnett and Salomon,
51 2012).
52

53
54 Marom (2006) and Lankoski (2008) put together the two previous hypotheses
55 and stated that, at the beginning, the satisfaction of the stakeholders' needs
56 means an increase in the performance of the organisations (*Social Impact*
57 *Hypothesis*). Later, however the costs of the social output are emphasised and
58 reduce the performance (*Trade-Off Hypothesis*). This means that the more
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3 socially responsible the company is, the more profitable it is up to a peak from
4 which the increases in CSR are followed by decreases of performance.
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6 In contrast, Barnett and Salomon (2012) defended that the first part of the curve
7 should have a downward slope, due to the high cost of starting to carry out CSR
8 practices. Nevertheless, this slope goes upwards when the different
9 stakeholders realise and value them (at that point the incomes exceed the
10 costs). So, according to them, this is a U-shaped relationship.
11

12
13 Companies in the electrical industry are widely recognised as being top-ranking
14 in publishing CSR or sustainability reports (Alonso-Almeida, 2013). This is a
15 reflection of their high engagement with the CSR approach. This brings about
16 being committed to CSR having become a requirement in the sector if
17 companies do not want to have major negative effects on their performance
18 (Margolis and Walsh, 2003). Considering this evidence, we predict that:
19

20
21 H1: The impact that CSR actions have on the FP of the electrical companies is
22 explained by a U-shaped curve.
23

24 Additionally, it has been pointed out that a company's CSR policy is composed
25 of several social outputs - each having diverse implications for the different
26 stakeholders- and the great importance of the stakeholder management policies
27 (Marom, 2006). In this sense, both approaches emphasise that each firm should
28 identify those more economically worthwhile stakeholders and focus its CSR
29 activity on them. Therefore, we are going to test the relationship, considering
30 the different CSR dimensions in order to know if each of them has financial
31 returns. In accordance with Barnett and Salomon's (2012) and Michelon *et al.*'s
32 (2013) articles, the most used CSR disaggregate measures are the seven
33 dimensions identified by KLD: (1) community, (2) diversity, (3) employment, (4)
34 product responsibility, (5) environment, (6) corporate governance and (7)
35 human rights.
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37

38 In this regard, empirical evidence cannot be found in the literature about what is
39 the best approach which explains the effect that each CSR dimension has on
40 the firm's performance for multi-sectorial samples.
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43 Regarding the environmental variable, its relationship with corporate
44 performance has been extensively studied, supported by traditional (Trade-Off
45 Hypothesis-Friedman, 1970) and revisionist theoretical framework (Fujii *et al.*,
46 2013). This revisionist point of view defends that the profits may exceed the
47 costs based on the Win-Win hypothesis (Porter and Van der Linde, 1995) since
48 actions oriented to the environment can produce cost savings through
49 improving the efficiency and reducing waste and risks (Lankoski, 2008). This
50 involves both the positive linear and the curvilinear approaches (U-shaped and
51 inverted U-shaped).
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54 The previous evidence shows an effect of this kind of actions on the
55 performance. Some of them present a linear impact (Molina-Azorín *et al.*, 2009;
56 Pérez-Calderón *et al.*, 2011; Guenster *et al.* 2011) and others a curvilinear
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relationship (Wagner *et al.*, 2002; Schaltegger and Synnestvedt, 2002; Dawkins and Fras, 2011; Fujii *et al.*, 2013).

However, due to the singularity of this industry (Deegan and Gordon, 1996; Mio, 2010; Pätäri *et al.*, 2012) and the accusations of carrying out environmental friendly actions to improve their reputation (Vries *et al.*, 2013), we expect that:

H2a: The environmental actions do not have an influence on the financial performance of the company.

Concerning to the other CSR dimensions (Community, Diversity, Employment and Corporate Governance), we can find in the literature those who also support the linear - diversity (Francoeur *et al.*, 2008; Adams and Ferreira, 2009), employment (Deniz-Deniz and De Saa-Perez, 2003), community (Brammer and Millington, 2005; Cabeza-Garcia *et al.*, 2010) and corporate governance (Core *et al.*, 1999)- and the curvilinear approach -diversity (U-shaped- Capar and Kataba, 2003), employment (U-shaped- Sturman, 2003), corporate governance (inverted U-shaped- Andrés and Vallelado, 2008) and community (inverted u-shaped-Wang *et al.*, 2008).

Most empirical evidence found in multi-sectional samples shows a relationship between these dimensions and corporate performance. Moreover, no evidence has been found in the literature about that these relationships having to differ if the focus is on the electrical industry. Therefore, as we can predict that all these dimensions show an impact on the performance, we state the following hypotheses:

H2b: The diversity actions have an influence on the financial performance of the company.

H2c: The employment actions have an influence on the financial performance of the company.

H2d: The corporate governance actions have an influence on the financial performance of the company.

H2e: The community actions have an influence on the financial performance of the company.

3. Methodology.

3.1. Sample.

The sample is composed of companies from the electrical industry which operate worldwide and are listed in the stock markets of 26 different countries. Finally, we found 89 firms² for the period studied 2008-2011.

² The full list of companies is available in Appendix 1

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3 The Social Responsibility data were provided by the ASSET4 database. This
4 has already been used for this purpose by Ioannou and Serafeim (2012), due to
5 their being much employed by investors to build their sustainability reports. It
6 provides a collection of indicators³ (valued from 0 to 100) organised into four
7 pillars: Social Scores, Environmental Scores, Corporate Governance Scores
8 and, finally, Economic Scores. Additionally, the financial data were provided by
9 the DataStream database, one of the largest databases of companies' financial
10 and non-financial data.
11

12 **Dependent variable**

13
14
15 According to the evidence found by Orlitzky *et al.*, (2003) and Wu (2006), the
16 accounting measures are those which better reflect the performance-return of
17 the CSR actions, and, especially, the Return on Assets ratio (ROA). We are
18 going to use the current ROA since the attempts to demonstrate that there is a
19 time lag have not been successful (Orlitzky *et al.*, 2003).
20

21 **Independent variable**

22
23
24 Most articles use an aggregated CSR measure or index based on some of the
25 seven areas of stakeholder management ranked by KLD. While Waddock and
26 Graves (1997) proposed giving different weights to the dimensions in
27 accordance with importance (subjective academic opinions - CSR_nw below)⁴,
28 others suggested assigning equal importance to all the dimensions (Hillman and
29 Keim, 2001; Waldman *et al.*, 2006; Ioannou and Serafeim, 2012).
30

31
32 However, different equal-weights indices could be found in the literature,
33 depending on the number of dimensions included. Thereby, we can see indices
34 which include only two dimensions - social and environment issues, CSR_2
35 below- (Ioannou and Serafeim, 2012); others (Bird *et al.*, 2007), which consider
36 the five dimensions related to primary stakeholders according to Clarkson
37 (1995) -community, diversity, employment, product responsibility, environment;
38 CSR_5 below- or, finally, Kang *et al.* (2010) , among others, which take into
39 account the seven areas identified by KLD -community, diversity, employment,
40 product responsibility, environment, human rights and corporate governance;
41 CSR_7.
42

43
44 Therefore, we are going to consider these four aggregated CSR measures:
45

46 **CSR_nw:** 0.142* Environment + 0.148* Community + 0.089* Diversity + 0.168*Employee +
47 0.154* Product_Responsibility.
48

49 **CSR_2:** 0.5*Social Score + 0.5* Environmental Score.
50

51 **CSR_5:** (Environment+Community+Diversity+Employee+Product_Responsibility)/5
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54
55 ³ The full list of the social indicators provided by the database is in Appendix 2.

56 ⁴ According to Waddock and Graves (1997) the weights should be: Employees (0.168), Product
57 (0.154), Community (0.148), Environment (0.142), Treatment of women and minorities (0.136),
58 Nuclear power (0.0089), Military contracts (0.086), South Africa (0.076).
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3 **CSR_7:**(Environment+Community+Diversity+Employee+Product_Responsibility+Human
4 Rights+Corporate Governance)/7
5

6 Additionally, since one of our aims is to identify the return on the actions made
7 to the different stakeholders, it is also necessary to use disaggregated
8 measures (Inoue and Lee, 2011; Michelon *et al.*, 2013) to study the effects of
9 the seven dimensions of CSR on the FP.
10

11 **Control variables**

12
13 Moreover, we have included several control variables related to the activity of
14 the company, such as the size, the leverage level and the performance of the
15 previous year (to control endogeneity) based on the previous findings. The
16 company size is important because larger firms are more likely to carry out
17 sustainability behaviours (McWilliams and Siegel, 2001; Surroca *et al.*, 2010).
18 This was measured by the logarithm of the total sales (Inoue and Lee, 2011).
19 The company's level of risk tolerance is reflected in their managers' attitudes
20 towards CSR actions, especially to elicit savings, incurring future or present
21 costs and building or destroying markets (Waddock and Graves, 1997). This is
22 measured by the leverage ratio.
23
24

25
26 Additionally, we control our model by three measures which depend on the
27 country of origin of each company. Two of them are related to the legal
28 enforcement of the sustainability reports, and the third one to the market. Firstly,
29 we included a "*report*" variable which indicates if the company has to
30 compulsorily report CSR information⁵. That is, if the sustainability or CSR report
31 is mandatory or voluntary for them (dummy variable)⁶ due to the different
32 patterns identified (Gray *et al.*, 2001). In this sense, in many countries it is even
33 mandatory to publish a CSR report for the main companies which are in their
34 stock indexes (Alonso-Almeida *et al.*, 2013). The advantages or disadvantages
35 of the mandatory publication of CSR reports are not completely clear (Mobus,
36 2005). This could be good since each company has to reveal what they are
37 really doing for society. On the other hand, having to disclose about something
38 that is voluntary could be contradictory.
39
40

41 Furthermore, taking into account that GRI⁷ reporting guidelines had published
42 an adaptative supplement for electric utilities companies in 2009, it is interesting
43 to control if there is any specific adaptation in the regulation for that sector in
44 each country due its specific characteristics (regardless of it being mandatory or
45 voluntary). Therefore, we have introduced this "*special regulation*" variable
46 (dummy)⁶.
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53 ⁵ In "Carrots and Sticks. Sustainability reporting policies worldwide – today's best practice,
54 tomorrow's trends" KPMG (2013), there is a detailed list of all the CSR regulation across all the
55 countries.

56 ⁶ Dummy variables: 0 for voluntary and 1 for mandatory reports; 0 for no adaptation and 1 for
57 specific adaptation; 0 for monopoly and 1 for no monopoly.

58 ⁷ Global Reporting Initiative.
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3 Finally, we include a “monopoly” variable, since many electric companies
4 operate as a monopoly in their countries⁶. This is in order to control if there are
5 some differences between them and those firms which operate in free markets
6 or in oligopolies because of the intensity of the competition affecting the firms’
7 performance (McWilliams and Siegel, 2000). To measure this, we are going to
8 analyse all the electrical companies included in each stock market to see if they
9 have to compete with others or not.
10

11 **3.2. Statistical Techniques**

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14 To achieve our aims, we are going to use two different methodologies. Firstly,
15 we are going to predict the score of the different dimensions that we could not
16 take directly from ASSET4 (Community, Diversity, Employment, Product
17 Responsibility and Human Rights) using PLS methodology (Partial Least
18 Square) because we have the scores of different indicators for each CSR
19 dimension (Appendix 2). Once we have the dimensions scores, we have
20 constructed the different CSR aggregate measures, and, finally, we estimate
21 several panel data regression models.
22

23 **Prediction of Dimension Scores by PLS**

24
25
26 Structural equation modelling (SEM) is a multivariate technique which combines
27 aspects of multiple regression and factor analysis to simultaneously estimate a
28 series of interrelated dependence relationships. The data analysis through SEM
29 has expanded rapidly in recent years in many fields of social sciences but not in
30 the accounting field (Lee *et al.*, 2011), due to a certain reluctance of
31 researchers.
32

33
34 According to Roldán and Sánchez-Franco (2012) SEM analysis can be carried
35 out through two different statistical techniques: covariance-based methods
36 (LISREL, AMOS) and variance-based methods (PLS). Taking into account that
37 our aim is to predict the dimensions’ scores, PLS is more suitable (Chin, 2010).
38

39
40 According to Lee *et al.* (2011), in order to predict the value of the dimensions,
41 the PLS algorithm is based on two matters: the indicators and the relationship of
42 the dimensions with the financial measure in the model. This process has three
43 different stages, although we are only going to focus on stage 1 (Figure 3).
44

45
46 The dimensions have been built by the consideration of the indicators provided
47 by ASSET4 for each dimension as formative indicators. This is why we have to
48 carry out several tests of collinearity between the indicators included in each
49 dimension to remove those which reveal this problem ($FIV > 30$ and two or more
50 correlations over 0.5). The eliminated indicators are crossed out in Appendix 2.
51

52
53 Once this was solved, the programme gave us the predicted scores for each
54 dimension. These allow us to form the aggregated measures.
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Data Panel Regressions

We are going to estimate random effects models since we are not interested in the company effect, assuming that the variation across entities is random. Therefore, we estimate two models for testing the linear relationship and two models for the curvilinear one:

- (1) $ROA_t = \beta_1 + \beta_2 \text{Aggregated CSR}_t + \beta_3 \text{Ln Sales}_t + \beta_4 \text{Leverage}_t + \beta_5 \text{Report}_t + \beta_6 \text{Special_Regulation}_t + \beta_7 \text{Monopoly} + \beta_8 \text{ROA}_{t-1} + \varepsilon$
- (2) $ROA_t = \beta_1 + \beta_2 \text{Environment}_t + \beta_3 \text{Community}_t + \beta_4 \text{Diversity}_t + \beta_5 \text{Employment}_t + \beta_6 \text{Product_Responsibility}_t + \beta_7 \text{Human_Rights}_t + \beta_8 \text{Corporate Governance}_t + \beta_9 \text{Ln Sales}_t + \beta_{10} \text{Leverage}_t + \beta_{11} \text{Report}_t + \beta_{12} \text{Special_Regulation}_t + \beta_7 \text{Monopoly} + \beta_8 \text{ROA}_{t-1} + \varepsilon$
- (3) $ROA_t = \beta_1 + \beta_2 \text{Aggregated CSR}_t + \beta_3 (\text{Aggregated CSR}_t)^2 + \beta_4 \text{Ln Sales}_t + \beta_5 \text{Leverage}_t + \beta_6 \text{Report}_t + \beta_7 \text{Special_Regulation}_t + \beta_7 \text{Monopoly} + \beta_8 \text{ROA}_{t-1} + \varepsilon$
- (4) $ROA_t = \beta_1 + \beta_2 (\text{CSR dimension}_t) + \beta_3 (\text{CSR dimension}_t)^2 + \beta_4 \text{Ln Sales}_t + \beta_5 \text{Leverage}_t + \beta_6 \text{Report}_t + \beta_7 \text{Special_Regulation}_t + \beta_7 \text{Monopoly} + \beta_8 \text{ROA}_{t-1} + \varepsilon$

4. Results and discussion

Descriptive Statistics

Figure 4 presents an overview of the evolution of the scores for each dimension (2008-2011). From that figure, we can deduce that the main concern for electric utilities companies is the environment. This obtains the best score every year. Additionally, the tendency seems to be increasing year by year, with the exception of 2009. The corporate governance score presents a similar behaviour and the employment score shows a completely opposite tendency. For the other dimensions, there is not a significant evolution during the period studied and their scores are very similar.

We report the sample descriptive statistics (Table 1) and the bivariate correlations between all the variables included in the study (Table 2). From the statistics shown in Table 1, we identify that “CSR_{nw}” is the CSR aggregate measure with a lower variability, while the dimensions that show a higher variability are the environmental and corporate governance ones.

As there is a considerable variation in firm size and leverage, it is necessary to include these variables in the study to control those aspects. Additionally, we find that CSR reporting is mandatory for 73% of the companies, the report only being voluntary in 10 countries (Brazil, Chile, the Czech Republic, Hong Kong, India, New Zealand, the Russian Federation, Saudi Arabia, South Korea and Switzerland). However, only three countries (Brazil, China and Poland) have a specific CSR regulation for their electric companies (11% of the sample) and 71% of the firms operate in free markets.

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3 From Table 2, we observe that a significant positive correlation between the
4 CSR aggregate measures and ROA is reported (except for the “CSR_7”).
5 Regarding the CSR dimensions, some of them report a positive correlation with
6 the ROA (Community, Diversity, Employment and Product Responsibility), while
7 others show a negative one (Human Rights and Corporate Governance).
8

9
10 Additionally, Table 2 shows that the Human Rights dimension is highly
11 correlated to the other CSR dimensions, so we do not include it in the CSR
12 disaggregated models.
13

14 15 **Multivariate tests**

16
17 Our results are summarised in Tables 3 and 4. In Table 3, the regressions for
18 the CSR aggregated measures are shown, while the results for the CSR
19 dimension are presented in Table 4.
20

21
22 From Table 3, firstly, we can deduce that all the aggregated CSR measures
23 have similar results (the coefficients and their significance) as do the
24 adjustments of the models. Regardless of the specific CSR aggregated
25 measure used, the results demonstrate that CSR actions have the same effect
26 on the performance of the firms. This means that the problem is not related to
27 the aggregation method used.
28

29
30 Therefore, we can deduce that the relationship is better explained by a
31 curvilinear approach, specifically by one that is U-shaped. This means that
32 there is an economic justification behind the highly-extraordinary or the initial
33 behaviours although the standard actions are not as well rewarded. This could
34 be because companies in the electrical industry are highly committed to CSR
35 (Alonso-Almeida *et al.* 2013) and, consequently, they are only highly rewarded
36 when the behaviours are exceptional or when they started to be engaged with
37 CSR due to the high cost of not being committed (Margolis and Walsh, 2003).
38

39
40 Once we have tested the aggregated CSR measure models, we are going to
41 focus on the performance output of the different CSR dimensions. At this point,
42 we realised that each of them shows a different impact or even no influence on
43 the FP.
44

45
46 Firstly, the non-existing relationship between the environment and the FP
47 reported in both models (linear and non-linear) agrees with our hypothesis
48 (H2a). These results also contrasts with previous evidence (Wagner *et al.*,
49 2002; Molina-Azorín *et al.*, 2009; Pérez-Calderón *et al.*, 2011; Fujii *et al.*, 2013)
50 which defended the impact of environmental actions on the performance in
51 multi-sectorial samples.
52

53
54 This leads us to confirm the distinctive purpose of the environmental actions
55 carried out in the electrical sector since there are no rewards associated with
56 behaving in an environmental friendly way despite being their greater concern
57 according to Figure 4. This could be because the motivations of the
58 environmental engagement of the electrical companies are more related to their
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3 need to legitimise (Deegan, 2002) and, in this way, to reverse the negative
4 environmental impact of their regular activities (Vries *et al.*, 2013).

5
6 Another CSR dimension shows no relationship with the performance:
7 employment. This result disagrees with the positive linear relationship found by
8 Deniz-Deniz and De Saa-Perez (2003) and Michelon *et al.* (2013) and the U-
9 shaped one found by Sturman (2003). Due to this, we can conclude that the
10 CSR actions oriented to employment may be carried out by the electrical
11 companies only because of their concern about the current economic situation.
12

13
14 From the results of the other dimensions, we can report that CSR actions
15 oriented to the community, diversity, corporate governance and product
16 responsibility have an impact on the performance, so they are likely to be
17 carried out to obtain financial rewards.
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19
20 In this regard, it seems there is a positive linear relationship between the
21 community dimension and corporate performance. This is contrary to previous
22 evidence found by Brammer and Millington (2005), Wang *et al.* (2008), Cabeza-
23 Garcia *et al.*, 2010) who defended a negative relationship. Furthermore, it has
24 to be considered that the importance of the community actions in the electrical
25 industry is not very high. In fact, this kind of CSR actions are the next-to-last
26 according to Figure 4.
27

28
29 In addition, we can report that the diversity and corporate governance
30 dimensions display a positive linear effect on the ROA, so they are explained by
31 the *Social Impact Hypothesis*. These results agree with the evidence found by
32 Core *et al.* (1999) and Adams and Ferreira (2009). They argue that having a
33 good corporate governance policy generates a better FP.
34

35
36 Nevertheless, another dimension' relationship is better explained by a U-shaped
37 relationship: product responsibility - although this can be also explained by the
38 positive-linear approach in line with Ionue and Lee's (2011) results.
39

40
41 Finally, the tests of the control variables are statistically significant for the
42 mandatory CSR report, the special electricity CSR regulation and the previous
43 performance of the firm. Nevertheless, the existence of competition or
44 monopoly in the electricity sector does not influence the relationship.
45

46
47 In light of these results, policy makers in some countries have to consider if
48 publishing CSR reports should be mandatory, because in some cases this
49 obligation may not help the CSR commitment as has been shown in our results.
50 They should also value the positive influence of having a specific CSR
51 regulation for the electrical sector due to its peculiarities.
52

53 **5. Conclusions**

54
55 This research aims to find out if the motivation for the socially responsible
56 behaviour of the electrical companies is the FP associated with it, as well as to
57 analyse if the relationship changes in the case of each CSR dimension being
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3 considered. That is, if the CSR actions are paying off (how those relationships
4 are) or whether there are other motives to be carried out (legitimation, "green-
5 washing" or pure altruism), with a special reference to the environmental actions
6 due to their importance in this industry.
7

8
9 We are able to conclude that the CSR actions are carried out by the electrical
10 companies looking for performance rewards (in the form of profits or cost
11 savings). Additionally, this relationship between the CSR and FP is explained by
12 a U-shaped curve which means that the larger performance rewards are
13 attained by the utilities companies which get the lowest and the highest CSR
14 scores, while those with less extreme scores are not so well rewarded. In this
15 sense, CSR behaviours are usual in this industry, therefore customers are only
16 going to value those which are incipient (in the case of CSR actions not being
17 carried out) or extraordinary (for those firms which have been committed to the
18 CSR for years).
19

20
21 Although no significant relationship with the performance of the company has
22 been identified, the environmental issues are the main concern of the electrical
23 firms because they get the better scores year after year. This confirms that they
24 are making a big effort in this area. Likewise, their environmental behaviour
25 does not aim to gain rewards, but is rather a way to legitimise and improve the
26 "dirty sector" image which is due to their negative environmental impacts.
27

28
29 On this point, the other CSR dimensions are also motivated by economic
30 rewards. Additionally, this allows us to conclude that each CSR dimension has
31 its own behaviour and all the hypotheses and theories developed serve to
32 explain almost all of them. As long as diversity, corporate governance and the
33 community present a linear relationship with the performance, the product
34 responsibility dimension is explained by both approaches.
35

36
37 The contribution of this study has been to show that the motivations of the CSR
38 engagement of the electrical companies are not always linked to "window-
39 dressing" or improving their image, but rather are often carried out for their
40 positive effect (via cost savings or benefits) on the financial performance of
41 companies. In this sense, it seems that only the environmental friendly
42 behaviours in electrical companies are motivated by that need to clean their
43 image and in some way to reverse their negative impact.
44

45
46 This work highlights the need to study this relationship in other industries with
47 some peculiarities (highest or lowest scores in a particular CSR dimension), as
48 well as the advantages of analysing disaggregated CSR measures. This is
49 because the motivations of each aspect or dimension could be completely
50 different among them and regarding CSR aggregated measures.
51

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53 Additionally, our results could be used by the managers of companies to know
54 which the most strategic and worthwhile CSR actions are and take them into
55 consideration in their decision-making processes in accordance with their
56 priorities.
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As a limitation of the paper, we should not forget that it has been based on the information disclosed by companies, and it would be a challenge in the future to study whether this agrees with the real actions carried out by them. Finally, the results obtained are hardly comparable, except in the case of some industries with many similarities to the electrical utilities.

For Peer Review

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Table 1: Descriptive statistics

	N	Mean	Standard deviation
CSR_nw	356	40.57	3.967
CSR_2	356	60.67	26.330
CSR_5	355	54.28	5.448
CSR_7	356	54.09	6.656
Environmental	356	62.82	24.535
Community	356	51.56	0.232
Diversity	356	52.01	0.989
Employment	356	54.07	7.363
Product_responsibility	356	51.07	0.524
Human_rights	356	52.68	0.336
Corporate_governance	356	54.43	30.791
Sales	353	6.65e+08	4.02e+09
Leverage	353	138.64	104.062
Report	356	0.27	0.444
Special_regulation	356	0.11	0.316
Monopoly	356	0.29	0.455
ROA	340	47.53	13.521

Table 2: Bivariate correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) CSR_nw	1																
(2) CSR_2	0,91**	1															
(3) CSR_5	0,99**	0,91**	1														
(4) CSR_7	0,77**	0,73**	0,77**	1													
(5) Environmental	0,95**	0,92**	0,96**	0,77**	1												
(6) Community	0,27**	0,24**	0,26**	0,11*	0,17**	1											
(7) Diversity	0,15**	0,08	0,14**	-0,01	0,05	0,38**	1										
(8) Employment	0,51**	0,32**	0,48**	0,29**	0,22**	0,31**	0,20**	1									
(9) Product_responsibility	-0,04	-0,06	-0,04	-0,16**	-0,07	0,21**	0,06	-0,01	1								
(10) Human_rights	-0,38**	-0,36**	-0,37**	-0,17**	-0,27**	-0,55**	-0,35**	-0,36**	-0,41**	1							
(11)Corporate_governance	0,28**	0,29**	0,29**	0,83**	0,32**	-0,06	-0,13*	0,02	-0,20**	0,05	1						
(12) Sales	0,08	0,10	0,08	-0,07	0,09	0,13*	-0,07	-0,01	-0,06	-0,08	-0,17**	1					
(13) Leverage	-0,09	-0,11*	-0,09	-0,03	-0,09	-0,02	0,06	-0,04	0,06	0,01	0,03	-0,06	1				
(14) Report	-0,03	0,02	-0,04	-0,35**	-0,08	0,08	0,14**	0,09	0,11*	-0,11*	-0,49**	0,22**	-0,34**	1			
(15) Special_regulation	-0,00	-0,03	-0,01	-0,23**	-0,07	0,13*	0,32**	0,14**	0,09	-0,10	-0,33**	-0,05	0,07	0,19**	1		
(16) Monopoly	0,11*	0,14**	0,12*	0,14**	0,14**	0,02	0,00	-0,03	-0,04	-0,11*	0,12*	0,13*	0,01	0,06	0,01	1	
(17) ROA	0,16**	0,11*	0,15**	-0,02	0,03	0,39**	0,36**	0,33**	,28**	-0,39**	-0,15**	0,03	-0,11	0,39**	0,25**	-0,04	1

Significant test ** < 0.01 * < 0.05

Table 3: CSR aggregated models

Independent Variables	Dependent Variable							
	ROA							
Constant	18.155 **	150.316 *	30.624 ***	34.460 ***	18.816**	147.869 *	19.298**	98.055 **
CSR_nw	0.397 *	-6.339 *						
(CSR_nw) ²		0.084 *						
CSR_2			0.051 *	-0.189				
(CSR_2) ²				0.002†				
CSR_5					0.283 *	-4.644 *		
(CSR_5) ²						0.046 *		
CSR_7							0.236 *	-2.779 *
(CSR_7) ²								0.028 *
Ln Sales	-0.570 †	-0.467	-0.557	-0.423	-0.569 †	-0.469	-0.479	-0.446
Leverage	-0.004	-0.004	-0.004	-0.003	-0.004	-0.004	-0.005	-0.004
Report	7.869 ***	8.117 ***	7.487 ***	7.768 ***	7.854***	8.139 ***	8.325 ***	8.579 ***
Special regulation	5.533 *	5.428 *	5.658 *	5.788 *	5.559 *	5.478 *	6.319 ***	6.542 ***
Monopoly	-0.418	-0.617	-0.391	-0.747	-0.422	-0.632	-0.219	-0.239
ROA _{t-1}	0.424 ***	0.415 ***	0.431 ***	0.416 ***	0.426 ***	0.416 ***	0.433 ***	0.428 ***
Wald Test	201.63 ***	208.00 ***	197.94 ***	202.84 ***	201.13 ***	207.75 ***	200.12 ***	207.74 ***

Table 4: CSR disaggregated models

Independent Variables	Dependent Variable						
	ROA						
Constant	-815.646***	33.615***	-81.487	719.201	0.707	8050.779*	30.196***
Environmental (Environmental) ²	-0.017	-0.132					
		0.016					
Community (Community) ²	8.273***		-10.363				
			0.245*				
Diversity (Diversity) ²	1.635**			-28.943			
				0.303			
Employment (Employment) ²	0.112				0.927		
					-0.007		
Product Responsibility (Product Responsibility) ²	6.488***					-320.634*	
						3.202*	
Corporate Governance (Corporate Governance) ²	0.046*						-0.071
							0.001
Ln Sales	-0.246	-0.476	-0.463	-0.399	-0.318	-0.155	-0.391
Leverage	-0.011	-0.004	-0.006	-0.009	-0.007	-0.008	-0.007
Report	7.667 ***	7.833***	7.895***	6.349***	6.784***	5.543***	7.609***
Special regulation	5.333*	5.994 **	5.841**	2.615	5.113*	6.195***	6.609***
Monopoly	-0.036	-0.698	-1.063	0.235	-0.681	-1.128	0.012
ROA _{t-1}	0.338***	0.432***	0.346***	0.411***	0.426***	0.437***	0.450***
Wald Test	283.41 ***	197.91***	235.80***	219.64***	202.04***	272.58***	196.14***

*** < 0.005, **<0.01, *<0.05, †<0.1

APPENDIX 1

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8	Acea	Edp Energias De Portugal	Pepco Holdings
9	Aes	Edp Renovaveis	Pg&E
10	Aes Tiete On	Electric Power Development	Pincle West Capital
11	Algonquin Power And	Elektrobras On	Pka.Grupa Energetycz
12	Utilities	Elia System Operator	Power Assets Holdings
13	Alliant Energy Corporation	Emera	Power Grid Corporation Of
14	Alpiq Holding	Endesa	India
15	American Electric Power	Endesa	Ppl
16	Areva	Enel	Public Power
17	Atlantic Power	Energy World	Public Service Enterprise
18	Beijing Datang Power	Energis	Group
19	Brookfield Renewable	Entergy	Red Electrica Corporacion
20	Energy Partners	Exelon	Reliance Infrastructure
21	Calpine	Fed.Grid Co.Of Ung.Sy	Rosseti
22	Cemig On	Firstenergy	Rushydro
23	Cez	Fortis	Saudi Electricity
24	Cheung Kong Infrastructure	Fortum	Shikoku Electric Power
25	Holdings	Great Plains Energy	Southern
26	China Resources Power	Hawaiian Electric Industries	Sp Ausnet
27	Holdings	Huaneng Power Intertiol 'A'	Spark Infrastructure Group
28	Chi Yangtze Pwr. 'A'	Iberdrola	Tata Power
29	Clp Holdings	Infigen Energy	Teco Energy
30	Cms Energy	Ite Holdings	Tega Siol
31	Consolidated Edison	Korea Electric Power	Ter Rete Elettrica Z
32	Contact Energy	Mvv Energie	Tractebel On
33	Cpfl Energia On	Nextera Energy	Transalta
34	Datang Intertiol Power	Northeast Utilities	Verbund
35	Generation 'H'	Northland Power	Westar En.
36	Dominion Resources	Nrg Energy	Xcel Energy
37	Dte Energy	Ntpc	
38	Dynegy	Nv Energy	
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APPENDIX 2

CSR DIMENSION	INDICATORS OR DEFINITIONS	
COMMUNITY	1. Bribery Corruption and Fraud Controversies 2. Business Ethics Compliance 3. Corporate Responsibility Awards 4. Crisis Management 5. Critical Countries - Indigenous People Controversies	6. Donations in General 7. Implementation 8. Improvements 9. Monitoring 10. Patent Infringement 11. Policy 12. Total donations.
DIVERSITY	1. Diversity Compliance 2. Diversity Controversies 3. Family Friendly 4. Implementation 5. Improvements	6. Management Equal Opportunity 7. Managers female ratio 8. Monitoring 9. Policy 10. Work-Life Balance
EMPLOYMENT QUALITY	1. Announced Lay-offs 2. Bonus Plan 3. Employment Awards 4. Generous Fringe Benefits. 5. Implementation 6. Improvements 7. Key management departure. 8. Monitoring 9. Net Employment Creation	10. Personnel Turnover. 11. Policy 12 Salaries 13. Salaries Distribution 14. Salary gap 15. Strikes 16. Trade Union Representant 17. Wages or Working Condition Controversies
HUMAN RIGHTS	1. Child Labor Controversies 2. Freedom of Association Controversies 3. Human Rights Controversies 4. Implementation	5. Improvements 6. Monitoring 7. Policy 8. Suppliers Social Impact
PRODUCT RESPONSIBILITY	1. Customers Controversies 2. Implementation 3. Improvements 4. Monitoring 5. Policy 6. Product Access	7. Product Compliance 8. Quality Management 9. Social Exclusion Controversies 10. Technology Know-How Sharing
ENVIRONMENT	The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems	
CORPORATE GOVERNANCE	The corporate governance pillar measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long term shareholders	

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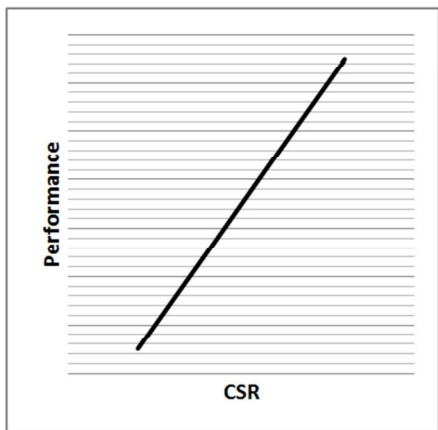


Figure 1.a. Social Impact Hypothesis

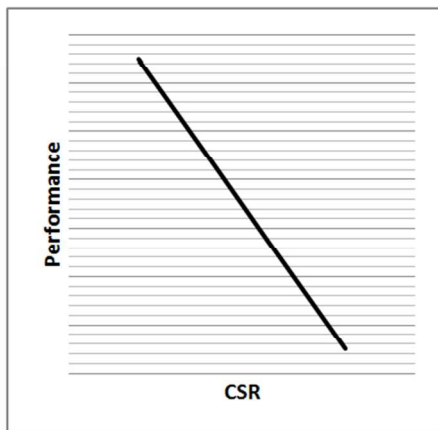


Figure 1.b. Trade-Off Hypothesis

Figure 1: Lineal approach of CSR-performance relationship.
238x129mm (96 x 96 DPI)

Peer Review

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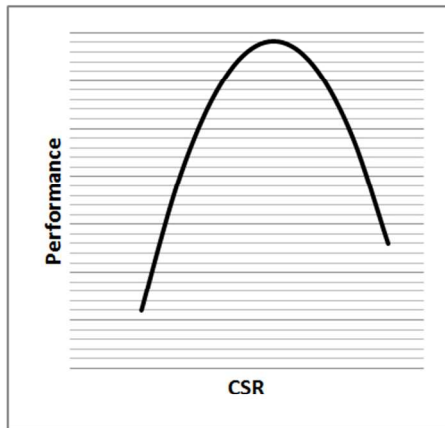


Figure 2.a. Inverted U-shaped

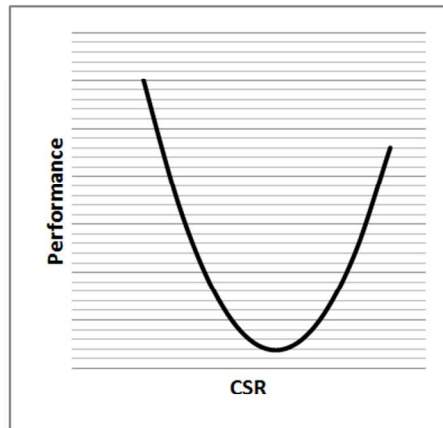
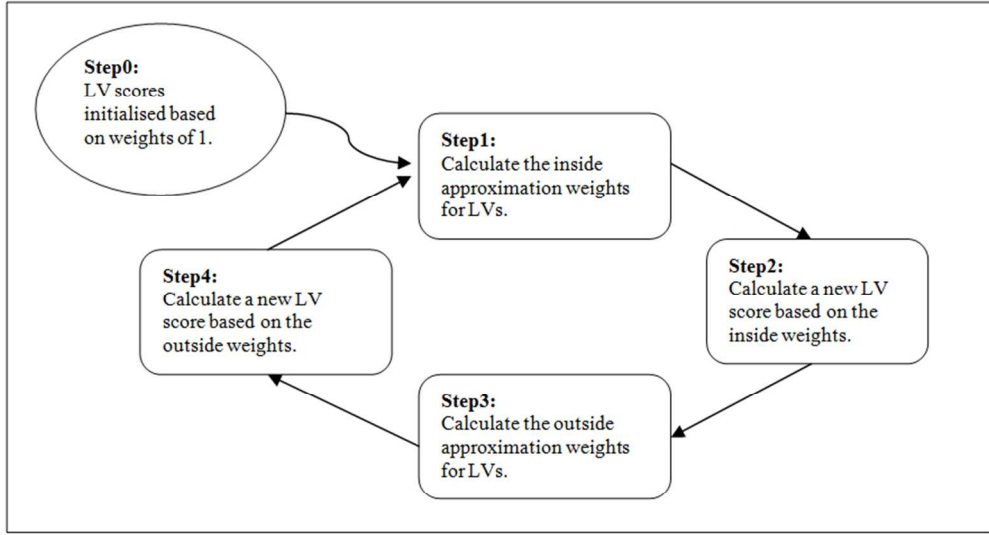


Figure 2.b. U-shaped

Figure 2: Non-linear approach of CSR-performance relationship.
236x124mm (96 x 96 DPI)

Peer Review

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Source: Adapted from Lee et al. (2011)

Figure 3: Prediction of the latent variable scores. PLS algorithm stage 1.
236x140mm (96 x 96 DPI)

Peer Review

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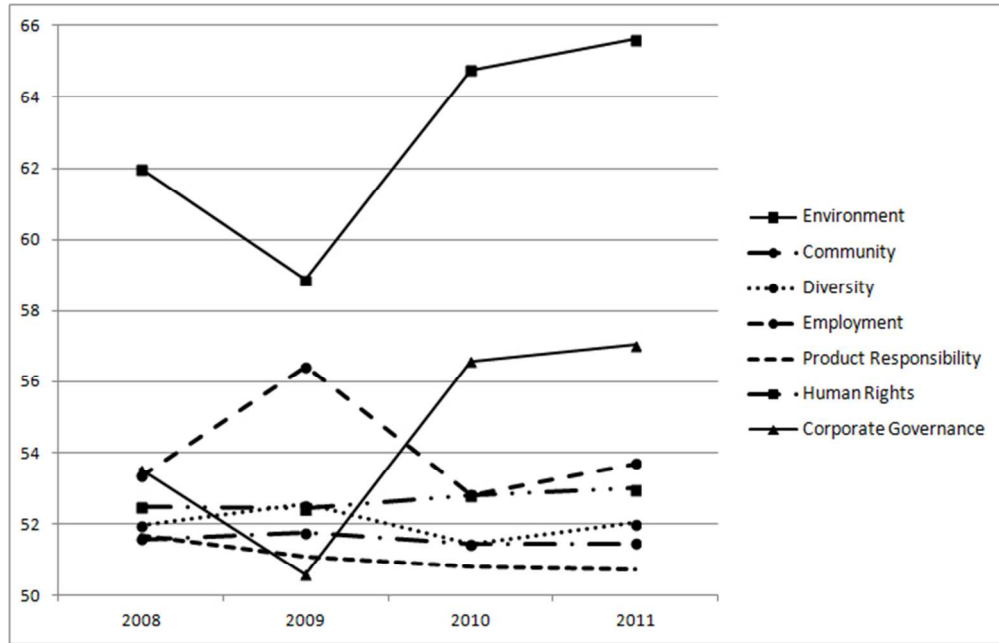


Figure 4: Evolution of the scores for each CSR dimension
186x121mm (96 x 96 DPI)

Review