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Risk and return characteristics of environmentally and socially responsible firms in Spain during a financial downturn: 2008–2011

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The onset of the global financial crisis in 2008 undermined trust in financial markets, with immediate damages to businesses and enduring negative effects for numerous national economies. The situation also has endangered progress in terms of investments in environmental and social management (ESM) issues, because managers may be more likely to embrace the misguided notion that such investments represent a non-returnable costs that will hinder firms' financial performance. Yet ESM is needed now more than ever, because "doing good and doing well" messages are highly appreciated by stakeholders and can substantially improve a firm's competitiveness. This article analyzes the performance of the Spanish FTSE4Good IBEX index, compared with that of the Spanish IBEX 35 index, during the financial crisis and reveals slightly better performance for the former. Thus, considering the difficult financial context, indicators of good environmental and social performance, among other factors, might have positive effects on stock index performance. The findings offer some key implications for managerial practice.

Introduction

A traditional view asserts that the main purpose of business is to maximize value for shareholders (Cuervo, 1991), so firms can largely ignore the impact of their activities on broader society (Melé, 2007). However, the development and advancement of stakeholder theory (Freeman, 1984) requires taking all agents associated with business decisions into account in the course of the firm's normal operations (Melé, 2007), so that it can create long-term, sustainable wealth and value. Therefore, business objectives should encompass not only the pursuit of financial performance but also striving to achieve social goals, especially those that attract the attention of key stakeholders.

The case for environmental responsibility is an interesting one. Persistent environmental issues have prompted strong economic and social drivers, such that stakeholders expect corporations to assume responsibility for protecting the natural environment (Hoffman, 1999). This development should not seem surprising in the face of dramatic population and consumption increases, which have coincided with increasing waste levels in most industries. Because such waste has negative effects on natural and environmental ecosystems, industries and the various agents involved in their associated economic activities experience increasing pressures to comply with the environmental demands of public administrations, consumers, and other socio-economic agents (Buysse & Verbeke, 2003). Regulatory demands offer another important driver, in that legislation and enforcement can largely define the green agenda for business sectors (Banerjee, 2001; Buysse & Verbeke, 2003).

Companies cannot ignore these expanding environmental and social demands, because they would suffer substantial losses were they to do so. For example, they might lose access to financial resources, because investors increasingly rely on social and environmental decision-making criteria (De la Cuesta, Valor & Sanmartin, 2002; Viviers, Bosch, Smit & Buijs, 2008a, 2008b). In parallel with the various corporate social responsibility qualification and rating agencies (e.g., Ethical Investment Research Services - EIRIS-, Sustainable Asset Management -SAM-, Sustainable Investment Research International -SiRi-, Forum Ethibel), several investment funds and stock market indexes feature only businesses that comply with strict environmental and social demands (e.g., FTSE4Good Index, Dow Jones Sustainability Index, Domini 400 Social Index; Escrig-Olmedo, Muñoz-Torres & Fernandez-Izquierdo, 2013). Furthermore, as previous research has suggested, firms' financial performance might benefit from their environmental and social responsibility, according to the direct positive association of corporate environmental and social performance (CESP) with financial performance (Barnett & Salomon, 2012; Margolis, Elfenbein & Walsh, 2007; Orlitzky, Schmidt & Rynes, 2003).

Important efforts to implement management systems that can improve quality, ethics, and social and environmental practices thus have emerged in business sectors in recent decades (Beske, Koplin & Seurin, 2008). However, environmental and social issues often get excluded from productive processes, perhaps because of their high financial costs and the limited financial resources available to companies, especially small and medium-sized enterprises (SME) (Del Brio, Fernández & Junquera, 2001; Hillary, 2004; Nidumolu, Prahalad & Rangaswani, 2009). Another

barrier to the implementation of environmental management systems (EMS) in particular relates to uncertainty that persists among practitioners about their real results (Hillary, 2004; Ravi & Shankar, 2005), such that many managers believe the costs of implementing EMS might be greater than the benefits they provide (González-Torre, Alvarez, Sarkis & Adenso-Díaz, 2010; Hassel, Nilsson & Nyquist, 2005; Walley & Whitehead, 1994).

The vagueness and inconsistencies in prior research that has sought to identify the causality and directionality of this relationship allow for persistent claims that the advantages of environmental responsibility are not sufficiently real, direct, or immediate. Inconsistent results address the association between CESP and financial performance (Graves & Waddock, 1999), such that studies report weak positive (Preston, 1978), neutral (Orlitzky & Benjamin, 2001), or even negative (Patten, 2002) associations. Similar relationship patterns emerge from assessments of environmental performance, in that previous findings report positive (Al-Najjar & Anfimiadou, 2012; King & Lenox, 2002; Nakao, Amano, Matsumura, Genba & Nakano, 2007), quasi-neutral (Jacobs, Singhal, & Subramanian, 2010), and negative (Filbeck & Gorman, 2004; Hassel *et al.*, 2005) links. Other studies indicate that causality might run both ways, such that strong financial performance facilitates the firm's engagement in CESP (Waddock & Graves, 1997) or environmental performance (Nakao *et al.*, 2007), which in turn might reinforce positive financial performance (Al-Najjar & Anfimiadou, 2012; French, Schwert & Stambaugh, 1987; Margolis *et al.*, 2007; Nakao *et al.*, 2007; Orlitzky *et al.*, 2003; Waddock & Graves, 1997). Finally, prior research indicates the need to take into account several moderating variables, such as company size (Iwata & Okada, 2011; Orlitzky, 2001), industry (Iwata & Okada, 2011; Ruf, Muralidhar, Brown, Janney & Paul, 2001), R&D investments (McWilliams & Siegel, 2000), financial leverage (Fauzi, 2009), or stakeholder influence capacity (Barnett & Salomon, 2012) to explain these relationships.

In summary, the effects of CESP on financial performance appear highly complex, which implies the need for ongoing research. In this regard, we seek to analyze a turbulent context to determine if firm efforts to act as a good environmental and social corporate citizen pay off. A turbulent context might highlight companies' real interest in CESP, because such periods are not particularly amenable to investments in environmental and social concerns. For example, managers facing uncertainty rarely make the upfront investment to build new, environmentally friendly technologies and processes if they are not truly committed to the environmental cause (Kimbrow & Melendi, 2010). As such, the difficult financial environment that has faced Spain and the European Union offers an ideal setting for testing whether the diverse benefits of ESM (e.g., sales, market share, employee commitment) (Curran & Moran, 2007; Ducassy, 2013) persist in a turbulent market. This context also has been marked by substantially reduced trust in the financial system, so we consider whether in such a negative scenario firms with good CSEP enjoy a stronger corporate reputation or receive better treatment from investors. Ethics

practice is known to constitute a key determinant of long-term, stable partnerships, as well as for ensuring trust between firms and their stakeholders (Swift, 2001). As such, a good reputation for CESP—which also should imply the presence of appropriate corporate governance criteria, in accordance with the Principles for Responsible Investment (PRI, 2006; FTSE, 2012)—should permit companies to restore trust and reputation in the economy, which then may have ultimately positive effects on the firm's financial bottom line.

To achieve good CESP, the firm must, for some specified period, perform better in improving and protecting environmental and social welfare than its competitors (Luo & Bhattacharya, 2009). Even as they remain in compliance with globally recognized principles to manage environmental and social concerns, good CESP firms also meet current market needs, without compromising the ability of future generations to meet their demands (Hart, 1997). Thus, some examples of good CESP policies include (a) minimizing as much as possible the use of natural resources (e.g. air, energy, air, minerals) used in the production of goods or the delivery of services; (b) reusing and recycling goods and materials whenever possible; (c) establishing and following good governance criteria; (d) ensuring workers' rights; (e) ensuring product safety; (f) implementing health and social security practices; (g) adopting environmental education and training programs; and (h) cooperating with suppliers to meet environmental, quality, and human rights objectives throughout the channel. However, in some countries, these seemingly universal examples might not coincide with stakeholders' expectations, whether due to different levels of economic development or culturally distinct circumstances, priorities, and dilemmas (Hamann, Agbazue, Kapelin & Hein, 2005). If specific social expectations do not require more widely accepted ethical values (e.g., safe working conditions, pollution reduction, minority right preservation, female equality), firms must build their CESP on an ethical foundation (Melé, 2009). Doing so helps firms overcome any ethical failings and facilitates their inclusion in demanding environmental and social stock indices.

From these foundations, we attempt to clarify the association between good CESP and financial performance during a relatively recent financial and economic downturn period. Specifically, we study the evolving behavior of two comparable stock market indexes from Spain, the FTSE4Good IBEX, which includes only environmentally and socially responsible firms, and its traditional benchmark, the IBEX 35. We also test for any significant differences in their behavioral patterns, using return and risk criteria. The risk and return behaviors, reflected in both indexes, refer to a very challenging period (April 2008–August 2011), marked by a global economic and financial crisis that had unique effects on Spain. Because little social or environmental responsibility research has addressed such a challenging financial context, this study offers an initial insight into whether resources dedicated to ESM pay off or instead impose additional economic burdens on firms. Some research suggests that such investments may be appropriate

only if they offer real gains for the firm (Siegel, 2009), and other scholars warn that sustainability initiatives can increase financial risk and uncertainty while reducing corporate value (Kiernan, 2007). These views echo the conventional economic wisdom that good environmental facilities hinder firms' competitiveness and financial performance (Kiernan, 2007; Mathur & Mathur, 2000; Walley & Whitehead, 1994). In response, we analyze in detail whether, in a financially difficult context, ESM benefits the firm or instead creates costs that harm its corporate financial value.

Theoretical framework and hypothesis

Although Porter's (1980) five competitive forces model has long served as a principal reference framework for strategic decision making, Waddock and Graves's (1997) theory, about the impact of different stakeholders' expectations, appears increasingly as a means to determine which strategies firms should adopt. In effect, consumers' changing expectations, regulatory shifts, and environmental concerns have increasingly powerful influences on corporate strategic decision-making patterns (Prahalad & Hamel, 1994). For example, international initiatives such as the UN Global Compact (UN, 1999, 2004) and the Principles for Responsible Investment (PRI, 2006) that offer businesses and investors guidance with regard to environmental, social, and governance (ESG) issues increasingly affect the strategic decision-making arena. Efforts to align with ESG principles drive both business (Bremer, 2008) and investment (Collison, Cobb, Power & Stevenson, 2009; Grene, 2008; Viviers *et al.*, 2008a, 2008b) decision making. In sum, many business agents have come to recognize that their objectives cannot be limited to strictly economic criteria but also should embrace these ESG challenges, especially if they hope to respond appropriately to the demands of stakeholders (Cuervo, 2005; Porter & Kramer, 2006) and ensure their competitiveness (Porter & Van der Linde, 1995).

Environmental challenges: Saliency in the corporate responsibility agenda

Responses to various social issues (e.g., defense of labor and human rights, product safety, consumer information, supply chain labor standards, labor relations) constitute key pillars on which businesses can build their ethically and socially responsible business decisions. Moreover, the fundamental function of business (i.e., to satisfy human needs; Fontrodona & Sison, 2006; García-Echevarría, 1994) relates inherently to environmental concerns, which therefore constitute an important element of any firm's CESP score (Molina-Azorin, Claver-Cortés, López-Gamero & Tarí, 2009). Appropriate responses to environmental challenges require thinking about a broad (present and future) societal context in relation to the market. Nor can environmental concerns be ignored by any businesses interested in addressing human needs and gaining social appreciation. Instead, proactive, environmentally friendly behaviors help firms develop necessary industrial and economic activities

in sustainable ways, to attend to the needs of current generations while also acting responsibly toward future generations (Marcus & Fremeth, 2009).

According to Melé (2009), environmental problems have long been threats to world society. Yet active social demands for better environmental performance, directed mainly toward business and government spheres, arose really seriously only in the 1960s, when activists expressed specific concerns about the use of pesticides, highly toxic metals in rivers, and oil-based waste in oceans (Melé, 2009). Around the turn of the twenty-first century, social demands for a reorientation of business activities toward environmentally responsible behaviors became more notable (Drake, Purvis & Hunt, 2004; Lucas, 2010). The root causes of modern environmental problems are diverse, including the economic and cultural forms of late modernity, a belief in divine permission to subdue the Earth, population explosions, consumption-driven lifestyles, and domination of the few over the majority (Melé, 2009). However, widespread agreement holds that logistic, market, transport, and industrial operations—business activity in general—constitute a primary driver of pollution and environmental damage (Ambec & Lanoie, 2008; Intergovernmental Panel on Climate Change, 2007). To address these damages, businesses thus need a proactive environmental strategy (Aragón-Correa, Hurtado-Torres, Sanjay & García-Morales, 2008; Klassen & McLaughlin, 1996; Melé, 2009; Piñeiro *et al.*, 2009).

Social and environmental management, social stock exchange indexes, and financial performance

Some controversy remains regarding whether better financial performance stems from socially and environmentally responsible engagements (Simpson, Taylor & Barker, 2004). Instead, economic investments in environmental and social practices seemingly could have negative impacts on a firm's financial bottom line (Kiernan, 2007; Marcus & Fremeth, 2009; Mathur & Mathur, 2000; Walley & Whitehead, 1994). This claim appears especially pertinent for investments by SMEs (Hillary, 2004; Simpson *et al.*, 2004). Other studies simply argue that implementing environmental and social policies and practices cannot by themselves lead to benefits for the firm (Barnett & Salomon, 2006), such that these engagements imply a value-added benefit, not a substitute for the firm's core business (Beneke, Wannke, Pelteret, Tladi & Gordon, 2012). In this debate, it appears that when involvement in corporate social responsibility issues occurs merely in response to legislation, the outcomes are not the same as those that result when a firm invests resources to go beyond the law, in a proactive attempt to improve or preserve environmental and social welfare. The former tactic does not reflect a real commitment to environmentally/socially beneficial performance; rather, it implies the consumption of resources aimlessly and without any particular strategic direction (Porter & Kramer, 2006). Thus, in the context of environmental concerns for example, a reactive strategy to achieve end-of-pipe pollution control is likely to create only

economic burdens (Melé, 2009), whereas a proactive strategy governed by a pollution prevention philosophy could drive financial gains (King & Lenox, 2002). That is, an environmentally friendly, proactive firm saves its production costs (e.g., productivity, efficiency, reduced inputs and waste, decreased pollution controls) (Lucas, 2010; Orsato, 2006; Piñeiro *et al.*, 2009). It also likely earns a distinct reputation among its stakeholders, which can lead to key business advantages (Chen, Lai & Wen, 2006; Piñeiro *et al.*, 2009; Siegel, 2009). Furthermore, if it develops environmental innovations, it might enhance the quality of its offerings and increase its market share (Lucas, 2010; Orsato, 2006). Therefore, being proactively green might be the strategy that pays off for firms (e.g., Chen *et al.*, 2006; Klassen & Whybark, 1999; Porter & van der Linde, 1995).

To facilitate the adoption of a proactive environmental strategy, an EMS is essential (Cora, 2007; Gonzalez-Benito & Gonzalez-Benito, 2005, 2008). To implement an EMS, the firm must have the necessary procedures and controls in place that can guarantee the achievement of its environmental policy and objectives (Cora, 2007; Gonzalez-Benito & Gonzalez-Benito, 2008; Hillary, 2004). Thus an EMS facilitates the company's environmental performance. It also may require high infrastructure investments in, for example, the production plan, organizational structure, and personnel training (Shen & Tam, 2002). A firm that implements an EMS likely exhibits high environmental engagement (Cora, 2007; Hillary, 2004) and effective management of aspects such as the use of natural (and limited) resources, water consumption, spillage of residual water, emission of contaminants into the natural environment, and so on. If the EMS is implemented in accordance with internationally recognized environmental standards (e.g., EMAS, ISO 14001), the company also gains qualifications to be included in socially responsible stock indexes. Therefore, the adoption of an EMS should help businesses attract more investors (Collison *et al.*, 2009; Curran & Moran, 2007; De la Cuesta *et al.*, 2002; Viviers *et al.*, 2008a, 2008b). It also may enhance the firm's corporate reputation among its stakeholders (including investors) (Curran & Moran, 2007; Marquez & Fombrum, 2005; Siegel, 2009), invoking additional external funding possibilities (Curran & Moran, 2007; Lozano, Albareda & Balaguer, 2006; Siegel, 2009).

In Spain, the FTSE4Good IBEX, launched in 2008 in collaboration with *Bolsas y Mercados Españoles*, is the primary social and environmental stock index (Chaves, Mozas, Puentes & Bernal, 2011; Escrig-Olmedo *et al.*, 2013; FTSE, 2008). Companies listed on it must exhibit their substantial efforts to (a) implement an environmental and social policy, (b) adopt an ESM system, (c) report their activities and behaviors periodically, and (d) perform in accordance with continuous objective decreases regarding their greenhouse gas emissions. Also, they are assessed by independent qualification agencies (e.g. EIRIS) against the FTSE4Good IBEX inclusion criteria on the basis of available information that can be accessed (i.e. websites, annual corporate social responsibility reports, responses

issued to questionnaires) (FTSE, 2008). As such, the companies that appear in this index are environmentally and socially responsible, as well as contributors to the sustainable development of business activity, which ultimately should have a positive effect on their financial bottom line (Barnett & Salomon, 2012; Klassen & Whybark, 1999; Piñeiro *et al.*, 2009; Porter & Kramer, 2006). We anticipate that this expected positive association between CESP and financial performance holds even during a financial crisis or in a volatile equity market (Kimbro & Melendi, 2010).

In turn, we propose that companies included in a social and environmental index, such as the FTSE4Good IBEX, are more profitable and less sensitive to market oscillations than are companies not included or not specifically screened on the basis of environmental and social criteria. In a turbulent complex setting, such as the one Spain experienced between 2008 and 2011, financial returns and risks should vary, depending on whether the companies engage more or less in environmentally and socially positive practices. Accordingly, we formulate the following null hypotheses:

H_{1,0}: There is no difference in the stock return averages (mean return) between companies included in an environmental and social stock index and those included in a respective Spanish conventional benchmark index.

H_{2,0}: There is no difference in the stock return variance (risk) between companies included in an environmental and social stock index and those included in a respective Spanish conventional benchmark index.

Data and methods

To test the null hypotheses, we compared the behavioral patterns and other traditional financial assets (returns, risk, liquidity) of a stock index that incorporates environmental and social requirements in Spain (FTSE4Good IBEX) against the same measures for the main index in the Spanish stock market, the IBEX 35 stock exchange value index, which does not screen for environmental and social issues. We gathered information about daily stock prices (minimum, maximum, and closing price), number of shares, trading volume, and market volume capitalization, as well as the values of the two indexes. The reporting period began with the first FTSE4Good IBEX quotation (9th April 2008) and ended approximately three years later (31st August 2011). The data came from different websites that collect information about stock markets (e.g., financial assets traded and quoted, nature, operations).

The IBEX 35 index includes some of the best companies in Spain, such as the 35 most liquid companies traded on the Electronic Stock Exchange Interconnection System (SIBE). The FTSE4Good IBEX instead offers the principal index for environmentally and socially responsible companies operating in Spain, which comply with globally accepted standards of good practices (Chaves *et al.*, 2011; Escrig-Olmedo *et al.*, 2013). These standards were developed

through extensive market consultations, shaped by a broad range of stakeholders, including nongovernmental organizations, governmental bodies, consultants, academics, investors, and the corporate sector (FTSE, 2008). These responsible companies mainly have been selected from the IBEX 35 index or the FTSE Spain All Cap index, which includes large, medium, and small capitalization universes for developed and emerging markets in Spain (Alonso-Mollar, Fernandez-Izquierdo & Nieto-Soria, 2011; Escrig-Olmedo *et al.*, 2013; FTSE, 2008). The firms also undergo biannual evaluations by qualification and rating agencies such as EIRIS and its research partner in Spain: ECODES (FTSE, 2008). Specific social criteria determine the selection of companies into the index, and environmental issues represent a principal dimension, as manifested in the requirements for “general environmental management” and “climate change management” (Alonso-Mollar *et al.*, 2011; FTSE, 2008).

As of 31st August 2011, the businesses in Table 1 appeared in both the IBEX 35 and the FTSE4Good IBEX Index. For our statistical test of the null hypotheses, we undertook a two-stage process. Using available information about prices of the two indexes, we first conducted Student t-test and Fisher's F-test. Because some businesses included in the IBEX 35 index also appear in the FTSE4Good IBEX, we next conducted similar Student t and Fisher's F tests using two portfolios composed only of businesses that did not overlap in both indexes. Therefore, we could differentiate the two portfolios on the basis of their environmental and social performance criteria. In addition, to obtain information about the portfolios' returns, we only used information about share prices earned by businesses that did not appear in both indexes.

Initial analysis

The Student t and F tests served to assess the null hypotheses that the difference in average stock returns either equals or differs from 0 and that the quotient of the variance returns either equals or differs from 1. For both tests, we assumed that the samples represented a paired sample; though they are really independent, they undergo daily but not random comparisons, so they represent a conditional relationship.

Neither intra-sample independence nor normality criteria were a problem in this study. First, the indexes rely on diametrically different inclusion criteria (liquidity vs. environmental and social standards), so the intra-sample independence criterion was met, even if a large percentage of securities were included in both indexes (i.e., 68.57% and 72.73%, respectively). Second, the distribution of indexes and portfolio returns appears to follow a normal distribution. The t-test features a sufficiently high number of degrees of freedom, in parallel with sample observations. Furthermore, the frequencies' distribution for monthly returns in a typical diversified portfolio should not differ significantly from a normal distribution (Haugen, 2001).

The Student t-test was useful for determining any differences in the stock's average returns between indexes, which can reveal which index is more profitable. According to Peña (2008), for the bilateral contrast of the t-test:

$$H_0 : \mu_{IBEX35} - \mu_{FTSE4GoodIBEX} = \mu_y = 0$$

$$H_1 : \mu_{IBEX35} \neq \mu_{FTSE4GoodIBEX} ; \mu_y \neq 0$$

where the independent variable is defined as “Y = IBEX35 – FTSE4Good IBEX.” We estimate the variance using the quasi-variance of the sample (\hat{S}_y^2):

$$(\hat{S}_y^2) = \frac{\sum(y_1 - \bar{y})^2}{n - 1} \quad (1)$$

for which the acceptance region of H_0 is:

$$|\bar{y}| \leq t_{\alpha/2} \frac{\hat{S}_y}{\sqrt{n}} \quad (2)$$

and the Student t has $n - 1$ degrees of freedom.

The F-test instead assessed whether there are significant differences in the variability of stock's returns (risk) between indexes, to reveal which index is more risky. In line with Peña (2008), the bilateral contrast in this situation is:

$$H_0 : \sigma_{IBEX35}^2 = \sigma_{FTSE4GoodIBEX}^2$$

$$H_1 : \sigma_{IBEX35}^2 \neq \sigma_{FTSE4GoodIBEX}^2$$

where the coefficient for variances is:

$$d = \frac{\hat{S}_{IBEX35}^2}{\hat{S}_{FTSE4GoodIBEX}^2} = F_{(n_1-1, n_2-1)} \quad (3)$$

and the acceptance region of H_0 is:

$$P(F \leq F_c) = 1 - \alpha \quad (4)$$

such that the Fisher F-test has $n_1 - 1$ and $n_2 - 1$ degrees of freedom.

Subsequent analysis

The second part repeats the Student t and F-tests, but with two purposefully created portfolios obtained from securities included in previous indexes. As Table 1 reveals, 24 companies are part of both indexes, which a priori leads us to presume that the behavior of the two indexes may be similar. To overcome the likely non-independence of samples, we designed two new portfolios, one for each index, which excluded any securities that belonged to both indexes. Thus, we obtained specific CFTSE4Good and CIBEX 35 portfolios, whose composition appears in Table 2. To have enough information to perform the statistical analysis, we also excluded Amadeus and IAG from the

CIBEX 35 portfolio, because they were not listed during the complete sample period (Amadeus began trading on 30th

April 2010, and IAG on 25th January 2011).

Table 1: Business stocks included in the IBEX35 and FTSE4Good IBEX indexes

IBEX35		FTSE4Good IBEX	
Abengoa	Ferrovial	Abengoa	Ferrovial
Abertis Infraestructuras	Gamesa	Acciona	Gamesa
Acciona	Gas Natural	Antena 3 TV	Gas Natural
Acerinox	Grifols	ArcelorMittal	GR empre ence
ACS	IAG	Banco Pastor	Iberdrola
Amadeus	Iberdrola	Banco Popular	Inditex
ArcelorMittal	Inditex	Banco Sabadell	Mapfre
Banco Popular	Indra Sistemas Serie A	Banco Santander	Mediaset
Banco Sabadell	Mapfre	Banesto	Melia Hotels
Banco Santander	Mediaset	Bankinter	OHL
Bankinter	OHL	BBVA	Prisa
BBVA	R.E.C.	BME	Prosegur
BME	Repsol YPF	Caixabank	R.E.C.
Caixabank	Sacyr Vallehermoso	CAM	Repsol YPF
Ebro Foods	Técnicas Reunidas	Deoleo	Telecinco
Enagás	Telecinco	Enagás	Telefónica
Endesa	Telefónica	FCC	
FCC			

Table 2: Business stocks included in the CIBEX and CFTSE stock portfolios

CIBEX	CFTSE
Abertis Infraestructuras	Antena 3 TV
Acerinox	Banco Pastor
ACS	Banesto
Ebro Foods	CAM
Endesa	Deoleo
Grifols	GR Empresarial ENCE
Indra Sistemas Serie A	Melia Hotels
Sacyr Vallehermoso	Prisa
Técnicas Reunidas	Prosegur

To obtain the weight for each security/share x_{jt} at a specific time t in the corresponding portfolio (CIBEX/CFTSE), we used the quotient between the capitalization of each asset at each point in time—the number of shares/securities traded by closing price—and the total sum of the capitalization of all selected businesses (excluding those listed in both indexes) at the same point in time (Brealey, Myers & Marcus, 2010). Thus, securities are individually weighted in this portfolio with a similar and proportional weight to their corresponding weight in their index:

$$x_{jt} = \frac{Capitalisation_{jt}}{\sum_{j=1}^n Capitalisation_{equity_{jt}}} = \frac{n^0 securities_{jt} \times closing price_{jt}}{\sum_{j=1}^n n^0 securities_{jt} \times closing price_{jt}} \quad (5)$$

Likewise, the portfolios' returns ($\tilde{r}_{portfolio,t}$) (at a determined moment of time t) are the weighted average of the securities' returns (\tilde{r}_j) that form their corresponding portfolio. For our study, the design of the portfolio implies that the sum of the weights for each t moment equals 1:

$$\tilde{r}_{portfolio,t} = \sum_{j=1}^N x_j \tilde{r}_j \quad (6)$$

and

$$\sum_{j=1}^N x_{jt} = 1 \quad (7)$$

After obtaining the series of returns for each portfolio and observing that the normality and independence criteria are fulfilled, we again conducted Student t-tests and Fisher's F-tests to contrast the null hypothesis of equal mean and variance in the stocks' returns between indexes (now portfolios). In this analysis, the portfolios only include securities that are not part of both portfolios simultaneously. Therefore, any return/risk differences should indicate faithfully the differences due to environmental and social practices.

Results and discussion

The similarity between the daily evolution of prices for both the FTSE4Good IBEX and IBEX 35 can be observed in

Figures 1 and 2. The line characteristic traced by the FTSE4Good IBEX, using the IBEX 35 as a reference stock index, shows a quasi-perfect positive correlation between the pairs of returns for both indexes, which indicates that both the sign and size of the behavioral patterns are similar (see Figure 2).

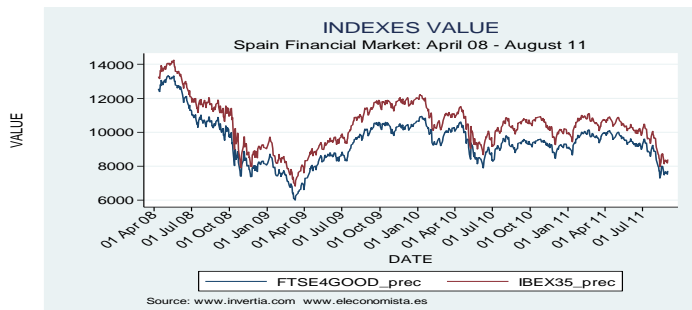


Figure 1: Daily evolution of IBEX35 and FTSE4Good IBEX

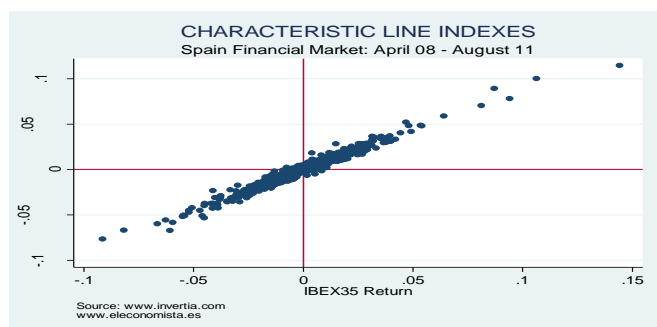


Figure 2: Characteristic line for the IBEX35 and FTSE4Good IBEX

In Table 3 we provide the descriptive statistics for the IBEX 35 and FTSE4Good IBEX, together with the results of the t-tests and F-tests. The means and standard deviations of the two indexes are similar. The t-test cannot offer sufficient evidence to reject the null hypothesis, so the difference of means is significantly equal to 0. Thus, the average performance observed during the sample period is similar for both indexes, according to their behavioral patterns. However, in terms of return risk and variability, the F-test implies some evidence to reject the null hypothesis of equal variances. The volatility in the performance of the indexes is not similar; in particular, the variability and fluctuations experienced by the IBEX 35 stock exchange index appear greater. Therefore, though the financial performance of these indexes tends to be similar, the volatility of stock returns is higher for the conventional stock index. This result is in line with previous findings (e.g., Bechetti, Di Giacomo & Pinacchio, 2005¹; Boutin-Dufresne & Savaria, 2004; Lee & Faff, 2009): *A priori*, companies that do not comply with environmental and social demands entail more risk for investors.

¹ In their study, firms included in a socially and environmentally responsible index reported lower returns on equity but relatively lower conditional volatility and smaller reactions to extreme stock market shocks.

Table 3: Descriptive statistics for IBEX35 and FTSE4Good IBEX

	IBEX35	FTSE4Good IBEX
Observations	863	863
Mean	-0.0003638	-0.0004139
Standard Deviation	0.0194134	0.0180271
t-test (paired means)	t = 0,4013 (0,6883)	
F-test (variance)	F = 1,1597 (0,0297)	

These data indicate that companies listed in the FTSE4Good tend to be safer and more stable for investors. However, because so many businesses appear simultaneously in both indexes, we created another two portfolios, to assign the possible differences in profitability and risk terms more clearly between IBEX 35 and FTSE4Good companies. Thus the CIBEX and CFTSE portfolios exclude companies repeated in both indexes. This time, the characteristic lines for both portfolios, using the IBEX 35 portfolio as a reference, do not reflect a defined behavioral pattern or any type of association (see Figure 3).

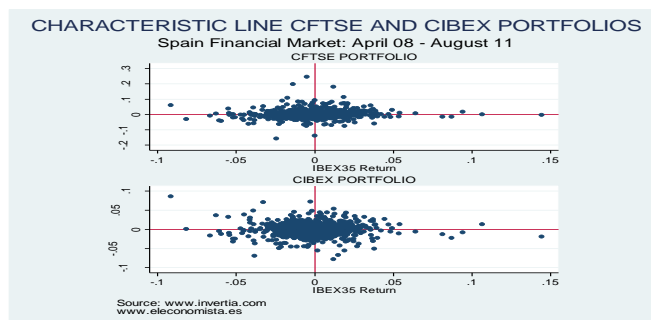


Figure 3: Characteristic line of CIBEX35 and CFTSE4Good portfolios

To analyze significant differences in the average and risk returns between these two portfolios, we conducted new t- and F-tests. In Table 4, the findings differ from those in Table 3. The null hypothesis of equal means between the average returns of the two portfolios cannot be rejected at a 5% confidence level, but we can reject it at a confidence level of 10%, which suggests partial support for the idea that companies that operate exclusively in the FTSE4Good IBEX achieve superior performance compared with those only included in the IBEX 35. Therefore, in contrast with companies that have not engaged actively in environmental and social issues, environmentally and socially responsible firms show higher average financial returns. The null hypothesis of equality of variances also should be rejected; the FTSE4Good portfolio induces greater variability and fluctuation in average financial returns and thus offers greater investment risk (see Table 4). This last result contradicts previous studies that find a lower investment risk for such securities (Bechetti *et al.*, 2005; Boutin-Dufresne & Savaria, 2004; Lee & Faff, 2009; Orlitzky & Benjamin, 2001), but it is in line with expectations about the nature and links of profitable securities. That is, securities generally should react with greater sensitivity to market oscillations if they provide a higher market premium, as confirmed by previous research that reveals a positive association between

risks and returns (Campbell & Hentschel, 1992; Anderson, Ghysels & Juergens, 2009; Ghysels, Santa-Clara & Valkanov, 2005).

Table 4: Descriptive statistics of CIBEX and CFTSE portfolios

	CIBEX	CFTSE
Observations	863	863
Mean	-.0000596	.0013642
Standard Deviation	.0168388	.0269723
t-test (paired means)	t = 1,6842 (0,0925)	
F-test (variance)	F = 2,5657 (0,0000)	

In summary, an average investor faced with two investment options—the selective IBEX 35 or the FTSE4Good IBEX—should realize that they likely will produce similar return patterns. However, when we separate out firms included simultaneously in both indexes, we find that the FTSE4Good IBEX achieves slightly higher average returns and, as is common for investments that provide higher market premiums, higher return volatility. In line with previous research that shows a positive association between corporate social and financial performance (Margolis *et al.*, 2007; Orlitzky *et al.*, 2003), we find that compliance with environmental and social responsibility criteria is associated with stronger financial performance, even during a financial crisis. Although the differences in the average returns obtained are not as striking as we might have expected, we show that efforts to integrate a sustainable strategy into normal business activities do not impose an overwhelming economic burden, nor are they incompatible with positive outcomes for the bottom line (Collison *et al.*, 2009; Curran & Moran, 2007; Schröder, 2007). This finding applies even in a difficult, fluctuating, financial crisis period. Rather, such efforts help companies adapt to stakeholder requirements with regard to their ESG concerns—an adaptive ability that seems increasingly necessary to ensure competitiveness in the long term (Curran & Moran, 2007).

Summary and conclusions

During economic and financial crises, trust issues hinder the fragile economic–social–financial system and must be resolved, which often prompts call for more ethical business conduct. Crises are unique times that can help businesses reflect on and demonstrate their great ethicality, as well as perform both good and well, which ultimately can enable global and national economies to return to growth trends. In this regard, commitments by businesses to integrate ESG issues in their strategies, beyond just meeting government regulations, offer an optimal means to recover the trust of stakeholders, including investors. Firms that appear in social responsibility indices, which signal their efforts to comply with demanding criteria beyond the letter of the law, appear more capable of restoring trust. Stakeholders likely perceive them as exemplars of ethical quality, closely involved in ensuring the sustainable development of the economy. However, investing continuously in new projects in an effort to become good corporate citizens may be less attractive to

business practitioners during times of crisis, when their financial resources tend to be severely limited.

With this article, we have attempted to address this question of whether investments undertaken by good CESP companies might enhance their bottom line, even in a challenging economic environment. We have demonstrated that businesses that work to live up to high environmental and social responsibilities achieve similar or higher returns than more conventional competitors. These findings thus help inform managers that investments and efforts to implement an ESM system do not create an economic burden; rather, they provoke high regard from the relevant economic market.

To achieve this insight, we have analyzed two Spanish stock exchange indexes, the FTSE4Good IBEX and the IBEX 35, during a financial crisis to identify differences in their returns. Our findings offer good reasons for managers to commit their companies to serious environmental and social business activities. The behavioral patterns for both general indexes are similar in terms of their mean returns but significantly higher for the FTSE4Good index. Although the returns of companies exclusively included in the FTSE4Good Index are more volatile, in traditional finance terms, higher risk is not unusual in exchange for higher profits (Campbell & Hentschel, 1992; Anderson *et al.*, 2009; Ghysels *et al.*, 2005). In this sense, our findings are perfectly compatible with the conventional selection of optimal investment options. We confirm that good CESP companies perform better financially than less environmentally and socially responsible businesses, even in the face of a global financial crisis and volatile market oscillations.

On the whole, we confirm prior research (e.g., Barnett & Salomon, 2012; Margolis *et al.*, 2007; Orlitzky *et al.*, 2003): Investments in adapting and integrating an environmental and social philosophy into normal business activities likely lead to better financial performance. Our study also provides a significant addition to extant research, in that we test this association during a period of financial difficulty. Few studies address the influence of CESP on businesses' financial performance in economic downturns. Thus, our findings extend previous literature that has asserted that firms enjoy a buffering effect in hostile environments when they adhere to good environmental and social standards (e.g., Benson, Gupta & Mateti, 2010; Ducassy, 2013; Schnietz & Epstein, 2005). Our study shows specifically that investments in time, financial, and human resources to gain admittance to corporate social responsibility investment indexes (FTSE4Good Index, Ethibel Sustainability Index, Domini 400 Social Index, S&P ESG India Index) are not an additional economic burden. Investors consistently appreciate firms' efforts to adapt to environmental and social demands, perhaps especially as those requirements continue to increase over time (Carroll & Bucholtz, 2008). If stakeholders expect businesses to keep improving their social performance continuously (Carroll & Bucholtz, 2008), there is no reason to predict that firms that adopt proactive environmental and social strategies will suffer

harm to their bottom lines. Instead, investments in adopting an ESM is what companies need to operate and relate optimally to their stakeholders and achieve positive outcomes, in terms of both corporate reputation and profitability. Sustainability indexes also are increasing in number (Sun, Nagata & Onoda, 2011) and significance (Adam & Shavit, 2008), such that companies included in such indexes likely can attract more financial capital (Giannarakis, Litinas & Theotokas, 2009). Our findings thus confirm what Chambers and Guo (2009) posit in macroeconomic terms, namely, that sustained economic growth and a sustainable environment can coexist perfectly.

However, we also acknowledge several limitations of this study. First, we included only information relative to stock exchange performance (stock returns and risk characteristics) to test the outcomes of CESP. Additional research might use more objective data related to performance, such as payouts, dividend distributions, or alpha and beta coefficients. Second, despite the existence of reports about the benefits for companies that adopt a good CESP, we did not assess the influence of these intermediate variables in the CESP-financial performance association. For example, CESP might represent a key causal dimension of corporate reputation (Carroll & Bucholtz, 2008; Marquez & Fombrum, 2005). Therefore, because trust improves stakeholder relations (Waddock & Graves, 1997), this effect on corporate reputation might explain the higher financial returns that businesses achieve when they demonstrate good CESP. Moreover, to the extent that a good corporate reputation results from good CESP, a firm can attract, motivate, and retain a diverse workforce (Coldwell, Billsberry, Meurs & Marsh, 2008) and get the best out of its employees (Treviño & Nelson, 2004). Further research should then test these useful indicators of the benefits obtained by good environmental and social performers as well as their links to financial performance rates. Finally, because this study focuses on a period of financial crisis, the volatility and risk of the securities likely were relatively high (Al-Rjoub & Azzam, 2012; Ortas *et al.*, 2012) and irregular, which could have affected our findings. Therefore, we hope further research replicates our analysis in less hostile macro-financial-economic scenarios, to generalize the findings or distinguish any interesting differences. The global financial crisis that started in 2008 may have affected economies globally, but its influences varied across countries, likely with greater impacts on emerging stock markets (Al-Rjoub & Azzam, 2012; Ortas *et al.*, 2012). Cross-cultural research involving different countries and stock exchanges thus would offer an interesting extension. In line with Ortas *et al.* (2012), we recommend that research focus on emerging markets (e.g., South Africa), because these countries present factors that make them unique from established economies (e.g., rapid population growth, high social and income inequalities, restricted local capital) and that could affect CESP. Also, although investor interest in sustainability issues has evolved (International Finance Corporation, 2011), it still remains relatively low in much of the world (e.g., South Africa) (Viviers *et al.*, 2008a, 2008b). In sum, a great need remains for more information about

investment quality and the performance of environmental and social stock indices.

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