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A Triptych Inquiry: Rethinking Sustainability, Innovation, and Financial Performance

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A Triptych Inquiry: Rethinking Sustainability, Innovation, and Financial Performance

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Abstract

Management scholars have sought to answer the question: is there a financial payoff for addressing ecological and social issues? We move beyond this question and include a time component for corporate financial performance (CFP) and a firm's innovativeness in order to ask: when does it pay? Combining a contingency perspective with the resource-based view of the firm clarifies the positive relationship between corporate environmental and social performance (ESP) and CFP, which only holds in the long-term but not in the short-term. Further, we find support for a moderating effect of innovation on the relationship between the ESP and short-term CFP as suggested by the literature. However, we empirically show that in the long-term, innovation mediates the ESP-CFP relationship suggesting that innovation should be considered as a long-term investment required to unlock the full potential of ESP initiatives.

JEL Classification: G30, M14, L20, Q01

Keywords: Sustainable development, innovation, firm performance, Tobin's q, moderation and mediation

INTRODUCTION

In light of the recent financial crises many economists and politicians claim that a paradigm change in modern capitalism is needed from short-term profit maximization to a long-term value creating and maintaining strategy. For managers this requires a focus on sustaining a competitive advantage through differentiation and cost-reduction strategies (Porter, 1985; Williams, 1992). Scholars studying organizations and the natural environment emphasize the role of ecological conditions on the competitive environment in light of related stakeholder claims and institutional changes (Buysse & Verbeke, 2003; Delmas & Toffel, 2004; Henriques & Sadorsky, 1999; Hoffman, 1999; Kassinis & Vafeas, 2006), internal resource specifications (Aragon-Correa & Sharma, 2003; Darnall & Edwards, 2006; Sharma & Vredenburg, 1998), and corporate responsibilities (Husted & Allen, 2007; Matten & Crane, 2005; Scherer & Palazzo, 2007). For managers this entails investing in resources that enhance the firm's environmental and social performance while continuing to pursue economic growth. The ultimate goals are to minimize the firm's negative effects on the natural environment and society without compromising corporate financial performance (CFP). However, are these mutually exclusive goals for the firm? We find that both goals are compatible in the long-run. Both are two different sides of the same coin and innovation is the missing link between them, which has not yet been fully specified in the literature.

Proceeding from early investigations (Bowman & Haire, 1975; Bragdon & Marlin, 1972), management researchers have investigated the relationship between a firm's environmental and/or social performance and CFP from different angles. Some studies examine why firms should address environmental and/or social issues (Gladwin, Kennelly & Krause, 1995; Hart, 1995; Shrivastava, 1995), others look at why firms do pursue high levels of environmental and/or social performance (Bansal, 2005; Sharma & Henriques, 2005), and still others take an instrumental perspective by examining the links between environmental and/or social performance and firm performance (King & Lenox, 2002; Klassen & Whybark, 1999). A few scholars attempt to generalize the findings of studies done thus far and suggest research has yielded mixed results (e.g., Murphy, 2002; Salzmann, Ionescu-Somers & Steger, 2005). Other analyses indicate that corporate virtue in form of CSP is likely to pay off (e.g., Margolis & Walsh, 2003; Orlitzky, Schmidt & Rynes, 2003). However, currently there is much confusion regarding the terminology, performance measurements, and the generalizability of the results (Griffin & Mahon, 1997; Peloza, 2009).

We make two contributions to this debate: First, since a challenge of corporate strategy is balancing ecological and social considerations while achieving attractive financial returns (Ambec & Lanoie, 2008; McWilliams & Siegel, 2001), we operationalize a balanced definition of an environmental and social performance (ESP) construct. Using similarly derived constructs in future research could prevent further confusion regarding the terminology and performance measurements. Second, we follow literature calls for incorporating a contingency perspective (Barnett, 2007; Berchicci & King, 2007; Rowley & Berman, 2000) in two directions: On the one hand, we introduce a short- vs. long-term differentiation to the ESP-CFP debate. On the other hand, we build upon recent work (Hull & Rothenberg, 2008) and theorize under what conditions the ESP-CFP relationship should be positive, particularly in regard to a firm's innovativeness. Including such a contingency perspective enables generalizations within the debate by emphasizing *when* ESP affects CFP.

THEORY

A balanced ESP construct

Contained within the influential Brundtland Report (WCED, 1987), three central dimensions are discussed as to how firms can address the challenge of global sustainable development: environmental integrity, social equity, and economic well-being (Bansal, 2005). Environmental integrity requires organizations to first understand their negative impacts on global ecosystems and natural resources and then take actions to mitigate those impacts (Whiteman & Cooper, 2000). Social equity is the understanding that corporations have not only a fiduciary responsibility to their shareholders, but also the responsibility in terms of achieving social equity among a diverse group of stakeholders such as customers, employees and community residents (Donaldson & Preston, 1995). Economic well-being is commonly understood as the third leg of the sustainability triangle, for corporations must of course generate profits and maintain their competitiveness (Ambec & Lanoie, 2008). For management research the main questions stemming from this triple bottom line understanding have been: What is the relationship between the first two central dimensions with the latter and how can firms formulate strategies to meet all three goals?

Previous studies (e.g., McWilliams & Siegel, 2000; Waddock & Graves, 1997) utilized a weighting scheme for the different social and environmental categories in order to construct

a score that measures corporate social performance or corporate social responsibility. Such schemes represent socially- and ethical-oriented performance metrics and, at the most, marginally include ecological considerations. However, Starik and Rands (1995) argue that achieving progress towards a sustainable development requires an effective integration of the different dimensions. In this sense, biased weighting schemes are unable to reflect an even picture of how firms address social *and* environmental issues. In a competitive environment increasingly concerned with sustainability, it is not clear why a specific environmental or social issue should be emphasized. Corporate attention to both dimensions is not mutually exclusive and linkages exist within and between the two. For example, the global environmental issue of climate change may create water scarcity in many regions, which in turn can cause negative social implications such as conflict and poverty (Barnett & Adger, 2007). It is, of course, difficult to judge which firms are doing better in terms of corporate sustainability; the ones that prioritize curbing emissions in order to mitigate climate change or the ones that prioritize improving living conditions the poorest regions of developing countries.

As such, we suggest a balanced ESP construct that reflects both dimensions adequately by equally weighting environmental and social aspects. We use the term corporate environmental and social performance to refer to a variety of voluntary and/or coercive activities undertaken by a firm in order to improve its performance with regard to the natural environment and in response to social and ethical issues. This ESP construct by itself does not include a financial component and is therefore distinct from Bansal's (2005) corporate sustainable development construct, which includes environmental, social, and financial considerations.

The ESP and CFP relationship

The resource-based view of the firm argues that rent-earning resources and capabilities determine the competitive advantage of firms (Barney, 1991). A firm's resources are defined as "those (tangible and intangible) assets which are tied semipermanently to the firm" (Wernerfelt, 1984: 172). Based on this, Hart (1995) advocates a theory of the 'natural resource-based view'. Under this framework firms can improve ESP and simultaneously secure a competitive advantage by 1) achieving lower costs through continuous improvement of pollution reduction technologies and processes, 2) preempting competitors by integrating a variety of stakeholders into creating more ecologically friendly products, and 3) by securing a favorable future position through "minimizing [the] environmental burden of firm growth and development" (Hart,

1995: 992). Many studies in this regard empirically demonstrate a positive linkage between ESP and CFP (e.g., Hart & Ahuja, 1996; King & Lenox, 2002).

Alternatively, there may be situations where firms should not invest in resources that enhance a firms' ESP as they can "gain little by providing public goods and market pressure should drive firms to make profit-maximizing choices about when and how much to provide" (Berchicci & King, 2007: 515). For example, in the ecological context authors have argued that a high level of environmental performance might be disadvantageous for CFP (Filbeck & Gorman, 2004; Walley & Whitehead, 1994) and still others find a neutral relationship (e.g., Elsayed & Paton, 2005). Similar mixed results can be found regarding empirical studies in the social context (cf., Ullmann, 1985). In sum, there are analyses proposing that existing studies are inconclusive (McGuire, Sundgren & Schneeweis, 1988; Salzmann et al., 2005; Ullmann, 1985) while others claim that there is a positive – or at least no negative – relationship (Margolis, Elfenbein & Walsh, 2009; Margolis & Walsh, 2003; Orlitzky et al., 2003).

As such, resource-investments in ESP are detrimental in some cases and advantageous in others. We suggest that this differentiation can be explained by including a contingency perspective and considering the specific time horizon under analysis. For example, firms focusing on the introduction of environmentally friendly products and services are often faced with immediate higher production costs, which can result in higher consumer costs (Marcus & Fremeth, 2009). These higher costs may not be well received by the market as the majority of consumers tend to stick with the less ecologically sustainable, but cheaper products (Marcus, 2005). Based on the premise that it takes time to develop environmental and social service markets, as well as taking time for the costs of such products and services to drop to a level that average consumers are willing to afford, it appears that investments in resources to develop such products and services may negatively influence CFP – at least over the short-term (Marcus, 2005; Marcus & Fremeth, 2009). Furthermore, firms may not realize cost savings of certain ESP investments if they lack the required capabilities (Christmann, 2000), which usually cannot be obtained in the short-term. We reflect these arguments in the following hypothesis:

H 1a: The relationship between ESP and short-term CFP is negative.

Going beyond this consideration of immediate financial effects, recent research suggests that a firm's social performance positively affects its long-term CFP (Brammer & Millington, 2008: 1330). Similar arguments can be made regarding environmental performance: the develop-

ment of a proactive environmental strategy designed to increase environmental performance can be a source for unique competitively valuable organizational capabilities, which can in turn have implications on competitiveness (Hart, 1995; Sharma & Vredenburg, 1998). These arguments are consistent with Porter's (1980) analysis of firms' competitive advantage; that successful differentiation is expected to lead to superior industry returns. In this sense, superior ESP management activities are strategic moves intended to differentiate the firm from competitors (Orsato, 2006). Furthermore, previous literature has discussed the benefits of ESP in terms of achieving increased efficiency, reduction of raw material and energy inputs, fewer fines and lawsuits, enhanced legitimacy, and greater employee morale and organizational commitment (Ambec & Lanoie, 2008; Carroll, 1999; Kassinis & Vafeas, 2006; King & Lenox, 2002; Klassen & Whybark, 1999; Russo & Fouts, 1997; Shrivastava, 1995). We consider the resulting financial benefits as long-term outcomes after initial investments for required resources have amortized and corresponding ESP efforts have been acknowledged by stakeholders. Therefore, our second hypothesis explicitly focuses on the long-term pay-off of investments in ESP-related resources.

H 1b: The relationship between ESP and long-term CFP is positive.

The link between innovation and CFP

Schumpeter (1934) is often credited with the initial idea that innovations can lead to competitive advantage that can be exploited by innovative firms.¹ Following this, a substantial body of research suggests that the relationship between a firm's level of innovation and CFP should be positive (Christensen & Bower, 1996; McWilliams & Siegel, 2000; O'Reilly & Tushman, 2004; Schumpeter, 1934; Zahra & Covin, 1995). For example, theoretical and empirical research investigating the connection between innovation and CFP shows that innovation provides firms with commercially superior products (Cooper & Kleinschmidt, 1987), better mechanisms to cope with environmental uncertainties (Damanpour & Evan, 1984), and an increased ability to create new resource configurations (Yiu & Chung-Ming, 2008). Specifically

¹ According to Larsen (1993), one of the most common definitions of innovation includes the "development and implementation of new ideas by people who over time engage in transactions with others within an institutional order" (Van de Ven, 1986: 590). These 'new ideas' include technical innovations, such as new products and services, and administrative innovations, such as new policies, strategies and organizational structures as well as a recombination of old ideas. Similarly, Damanpour (1991: 556) describes an innovation as a "new product or service, a new production process technology, a new structure or administrative system, or a new plan or program pertaining to organizational members". As overlap between these definitions, we use the term innovation to refer to any invention, new technology, idea, product, or process that has been introduced by the focal firm (Damanpour & Gopalakrishnan, 2001).

in the short-term, innovative firms can capture early mover advantages such as securing relationships with key suppliers (Doz, 1996), carving out attractive market share (Robinson, 1988) and forging customer loyalty (Parry & Bass, 1989). In the longer term, innovative firms can influence the regulatory regime (Frynas, Mellahi & Pigman, 2006), forge favorable product standards (Rumelt, 1987), and create a self-reinforcing culture of attracting innovative employees (Ireland & Webb, 2007). With the benefits of innovation spanning multiple time horizons, one can expect to find a positive relationship between innovation and CFP both in the short- and long-term:

H 2a: The relationship between innovation and short-term CFP is positive.

H 2b: The relationship between innovation and long-term CFP is positive.

Figure 1 about here

The Interaction of Innovation and ESP and Effects on CFP

As illustrated by Figure 1, we argue for both ESP having a positive as well as negative effect on CFP depending on the underlying timeframe used in the analysis. Furthermore, we hypothesize that innovation has a positive effect on CFP regardless of the time horizon. Considering this triptych inquiry of ESP, innovation, and CFP, the question arises as to how these three variables relate and interact with each other. A starting point in this debate are Waddock & Graves (1997) who find a positive relation between corporate social responsibility (CSR) and *past* CFP as well as a positive relation between CSR and *future* CFP. Further, McWilliams & Siegel (2000) propose that many such analyses are mis-specified as they leave out important control variables and so they conduct a similar analysis but include R&D as a measure of innovation. They find that CSR and innovation are highly correlated and suggest the effect of CSR on CFP is neutral when innovation is taken into account. Extending McWilliams & Siegel (2000), Hull & Rothenberg (2008) use innovation as a moderator for the corporate social performance (CSP) and CFP relationship. As result, they find a moderating relationship and support the initial argument that a positive relationship exists between CSP and CFP, but only in the context of low levels of innovation.

The substitution hypothesis

Hull and Rothenberg (2008) consider the relationship between CSP and innovation to be interchangeable. Following their substitution hypothesis, less innovative firms might chose to improve their firm performance in order to differentiate themselves from their competitors. In competitive environments requiring a high level of innovation, the authors suggest that CSP has a smaller effect on firm performance. They find that CSP has a greater impact on performance of those firms with low levels of innovation. If this observation holds true, then we could extend this argument to the broader concept of ESP where environmental criteria are equally weighted with social factors. Thus, if managers could simply substitute investments in ESP by increasing their innovativeness, then we can analyze such strategies on CFP in both the short-term and in the long-term. Therefore, hypothesized moderated relationships based on the substitution argument are as follows:

Hypothesis 3a: The negative relationship between ESP and short-term CFP is moderated by the level of firms' innovation in a way that a low level of innovation will decrease this relationship and a high level of innovation will increase this relationship.

Hypothesis 3b: The positive relationship between ESP and long-term CFP is moderated by the level of firms' innovation in a way that a high level of innovation will decrease this relationship and a low level of innovation will increase this relationship.

Figure 2 summarizes our research model for the substitution hypothesis. Following Aiken and West (1991), we illustrate the moderation effect displayed in hypotheses 3a and 3b for values (b) for the level of innovation at one standard deviation below the mean (low level of innovation; $b = \mu - \delta$), at the mean (there is no innovation effect; $b = \mu$), and one standard deviation above the mean (high level of innovation; $b = \mu + \delta$).

Figure 2 about here

The complementary hypothesis

Counter to the substitution hypothesis above, scholars have claimed that successful firms require a “strategy that integrates the goals of innovation and sustainable development” (Hall & Vredenburg, 2003: 61). As such, firms require complementary investments in both ESP *and* innovation to differentiate themselves from their competitors (Reinhardt, 1998). In this context, some researchers have argued that the relationship between ESP and innovation is sequential. For example, Porter and van der Linde (1995) consider innovation, triggered by environmental regulation, as a precondition for improved ESP and competitiveness. Another literature stream views ESP as a precursor to innovation (Fowler & Hope, 2007; Hart, 1997; Larson, 2000). For example, Hart (1997) argues that the vision of corporate sustainability acts as a ‘road map’ that guides innovation. This view has received empirical support from Fowler & Hope (2007) and Larson (2000) who analyzed the vision, organizational formation, and product development of entrepreneurial firms that remained committed to their corporate vision of sustainable development, which then dictated the types of organizational and technological innovations they deployed. As a result, a firm’s commitment to ESP may become a driver for new technological, administrative, and strategic innovations. In this way, innovation is likely to become the mechanism by which ESP influences CFP. Following this logic we hypothesize:

H4a: The negative relationship between ESP and short-term CFP will be mediated by the level of firms’ innovation, such that ESP impacts performance through innovation.

H4b: The positive relationship between ESP and long-term CFP will be mediated by the level of firms’ innovation, such that ESP impacts performance through innovation.

METHODS

Sample and Data Collection

We base our analysis on a data set obtained from KLD Research and Analytics, Inc. Prior research has used subsets of the KLD databases to construct an index of corporate social performance (Waddock & Graves, 1997; McWilliams & Siegel, 2000; Hull & Rothenberg, 2008); however, our data set diverges from these previous studies in two important ways. First, we obtained a KLD data set for the years 2001 through 2003 and our dataset included a larger set of companies (N=252) than what has been used in recent studies (e.g., Hull & Roth-

enberg, 2008, N=69). Second, one of the primary constructs under investigation is ESP, which is a balanced combination of firms' social and environmental performance. Thus, our ESP variable reflects an equal weighting of KLD's social and environmental ratings, whereas in previous research the environmental ratings were dominated by social ratings.

The complete KLD data set for 2001, 2002, and 2003 provided data for 900 North American based firms. Using these firms as a reference, we then used COMPUSTAT to gather data on financial performance, innovation and the control variables. However, a number of firms that were listed in the KLD index did not have complete data within the COMPUSTAT database for the required years. After eliminating those firms where complete information was not available, we obtained a final sample of 252 firms.

Variables and Measures

Environmental and Social Performance (ESP)

In our analysis, we consider ESP as independent variable that accounts for both the environmental and social performance of a firm. For the corporate social and environmental ratings KLD evaluates over 125 corporate social and environmental aspects and groups them into 13 broad categories. Seven of these 13 categories were deemed relevant for the development of our ESP measure and are included in our analysis. These categories are: 1) community (e.g. charitable donations and support for employee volunteer programs), 2) corporate governance (e.g. firm has not been engaged in controversial governance practices and places limits on executive and board member compensation), 3) diversity (e.g. firm promotes hiring of women, minorities, and the disabled), 4) employee relationships (e.g. firm has good relations with its unions and has a strong record in promoting the health and safety of its workers), 5) human rights (e.g. firm is recognized for its open, respectful, and transparent relationships with indigenous peoples and overseas factory workers), 6) product (e.g. quality of firm's products and avoidance of antitrust and product safety concerns), and 7) environmental, which includes such items as energy efficiency, pollution prevention, recycling, clean energy, environmental regulatory problems and degree to which it generates revenues from industries that generate large amounts of carbon dioxide emissions.

Those categories excluded from our analyses include KLD evaluations about controversial business issues, namely alcohol, gambling, tobacco, firearms, military, and nuclear power. Although many sustainability-oriented rating concepts for financial markets' indices and funds, as well as previous studies, include such "exclusion-criteria", we decided not to

take them into account when developing our ESP score for two reasons. First, some of the items may actually have a debatable or even positive sustainability effects as compared to other options. For example, many policy makers consider nuclear power as an important short-term solution for curbing CO₂-emissions. Similarly, it can be argued that military equipment is needed to obtain or maintain peace in certain areas of the world. Second, many of the other categories do not have an immediate effect on social developments or the natural environment. For example, human action – or more precisely human irresponsible action or abuse – is required in order for some of these categories to have negative effects on human or society. One example for this would be the consumption of alcohol. Our goal is not to expand the concept of corporate social and environmental responsibility to include such “third-party behavioral-dependent” items.

For each of the KLD categories, KLD provides several items that are labeled “strengths” and “concerns”. Each item is coded with a “1” if the firm has a strength respectively concern and elsewhere “0”. For each firm we then added the KLD social “strength” scores and afterwards subtracted the social “concerns”. From this overall social score we calculated z-scores to arrive at a standardized social score (Choi & Wang, 2009). Next we did the same for the environmental scores; we subtracted the sum of ‘concerns’ from the sum of ‘strengths’ and then calculated z-scores for the environmental dimension. Finally, we averaged the standardized social scores with the standardized environmental scores with equal weight to arrive at an ESP score. As such, we obtained a balanced score that reflects firms’ corporate sustainability (environmental and social) efforts.

Innovation

The second independent variable, innovation, was operationalized as R&D intensity (Choi & Wang, 2009; McWilliams & Siegel, 2000). This measure was constructed by taking each firm’s R&D spending and dividing it by the firm’s sales and then averaging these values across the three year period from 2001 through 2003. By using the three year average of R&D intensity we control for the influence of single year fluctuations in investments in innovative activities.

Financial Performance

The dependent variable, corporate financial performance (CFP), was measured using Tobin’s q. Tobin’s q is a dynamic performance indicator that reflects the stock market’s expectations about the profitability and growth potential of the firm as well as internal efficiency metrics, such as equity and assets (Kor & Mahoney, 2005). In this case, Tobin’s q is an appropriate

measure because we seek to understand the influence of ESP and innovation on the economic value generated by the firm, in both the long- and short-term (Wernerfelt & Montgomery, 1988). This measure is more appropriate than ROA or other accounting-based measurements, which are often used in studies investigating the ESP-CFP relationship. The pay-off of investments in ESP-related resources and innovation may or may not be reflected in the balance sheet and in the firm's market value, both of which constitute important parameters of economic value creation. As such, we calculated Tobin's q by dividing the sum of the firm's equity (market value), book value of long-term debt, and net current liabilities by the firm's total assets (Chung & Pruitt, 1994; King & Lenox, 2002).

Because of the temporal nature of our research question and hypotheses, it was necessary to construct both a short- and long-term performance measure. The short-term measure was operationalized by using Tobin's q for the year 2004, which is the first year following the 2001-2003 time periods that were used to calculate our ESP and innovation measures. Among studies that conceptualize the concept of long-term CFP, Eisenmann (2006) operationalizes long-term CFP of internet companies as about 2-years after their IPO. Prashant, Dyer, & Singh (2002) use the period 1993-1997 to assess the long-term CFP of alliances. Similarly, Combs et al. (2004) and Tosi et al. (2000) consider the 5-year average for measuring long-term return on equity. We derive our long-term CFP measure by averaging Tobin's q's for the second year (2005) through the fourth year (2007) following the investments in ESP and innovation (2001-2003).

Control Variables

A number of control variables are used as previous research has identified important factors affecting CFP. We used *firm size* since it can affect firm performance through economies of scale, monopoly power, and bargaining power. In this study, firm size is operationalized as the three year average of firm sales from 2001-2003. Furthermore, research has shown that a firm's *risk* is an important factor to be controlled (e.g., Choi & Wang, 2009; Waddock & Graves, 1997). Therefore, we used the three year average of long-term debt to total assets as proxy for the riskiness of the firm. Finally, *industry membership* has been cited as an influential factor on both ESP and CFP (e.g., Derwall, Guenster, Bauer & Koedijk, 2005; Ullmann,

1985). As such, we included dummy variables for each of the nine industries in our sample, as identified by the two-digit GICS code.²

Data Analysis

Our hypotheses were tested using hierarchical, mediated, and moderated regression analysis. These statistical tools allowed us to determine the effects of each variable separately and the interaction effects between the independent variables (Howell, 2007). More specifically, hierarchical regression analyses were used to identify main and interaction effects. In this type of analysis the interaction effects are found to be significant only if they explain a significantly greater portion of the variance in the dependent variable. Thus, moderated regression analysis helps test the significance of interaction effects by regressing the dependent variable onto two or more main variables (one independent and one moderator) and the cross product of those main variables (Sharma et al., 1981). If the addition of the interaction term significantly increases the power of the regression equation to explain the variance in the dependent variable, then the contingency relationship can be said to exist. Of course, moderation is only possible if it has been shown that strategic choice is not acting as a mediating variable.

Barron and Kenney (1986) provide a widely accepted technique for testing mediation. Barron and Kenny (1986) inform that there are four conditions that must be satisfied for a researcher to claim mediation. The first requirement is that there must be a relationship between the independent variable of ESP and the dependent variable of CFP. Second, there must be a significant relationship between the mediating variable of innovation and the independent variable; if this relationship does not exist then the variable cannot mediate anything. Third, the mediating variable must be related to the dependent variable. Finally, the effect of the independent variable on the dependent variable must be significantly weakened in the presence of the moderator variable.

Because we selected regression as the analytic technique, we first explored graphical representations of the data in order to ensure that our data satisfied the assumptions required to accurately apply regression techniques. The assumptions analysis revealed that the relationships between the variables were in fact linear, and it also revealed that all data points were viable - indicating that there were no outliers in our sample. Examination of the graphi-

² The industries are energy, materials, industrials, consumer-discretionary, consumer-staples, healthcare, financials, telecom, and utilities.

cal representations of the CSP variable indicate that the data were normally distributed and, thus, appropriate for use in regression analysis. However, the graphical representation of the innovation variable revealed that the data were suffering from positive skewness and kurtosis. As such, we conducted a data transformation (Hair et al., 2006) by taking the natural log of the innovation measure (R&D/sales). The graphical representation of the transformed data indicated that innovation measure was indeed normally distributed, therefore appropriate for use in the regression analysis. Further data exploration was conducted to ensure that the assumptions of normality and linearity had all been adequately satisfied (Hair et al., 2006). Once we were satisfied that the assumptions for linear regression had been satisfied we continued with our regression based hypothesis testing.

RESULTS

The descriptive statistics and correlations for our variables are reported in Table 1 and the standardized regression coefficients are reported in Tables 2 and 3 respectively. We report standardized coefficients so that differences in the strength of the relationships can over time be evaluated (Hair, Black, Babin, Anderson & Tatham, 2006). We tested our hypotheses using four separate regression models (see Table 2). Model 1 is the control model, Model 2 tests the ESP and innovation hypotheses, Model 3 test the moderation hypotheses and model 4 test the mediation hypotheses.

Table 1 about here

Short-term Financial Performance

We first tested hypothesis 1a which explored the possibility that there is a negative relationship between ESP and short-term financial performance. Results from Model 2 (see Table 2) indicate that there is a positive but non-significant relationship between ESP and short-term CFP ($\beta=.01, p > .10$). Thus, hypothesis 1a is not supported. Next, we tested hypothesis H2a, which argues for a positive relationship between innovation and short-term performance. The Model 2 regression revealed that the coefficient for innovation was positive and significant ($\beta=.376, p < .001$) thereby supporting hypothesis H2a. Next, we tested hypothesis 3a, which

argues that innovation would moderate the relationship between ESP and short-term CFP. Model 3 indicates that there is a negative and marginally significant effect for the addition of the interaction term ($\beta = -.116, p < .10$). As such, H3a is marginally supported. This finding seems to indicate that high levels of innovation investment negatively impact performance in those companies that are pursuing high ESP, at least in the short-term.

Table 2 about here

We then tested hypothesis 4a which argued that innovation would mediate the ESP-CSF relationship in the short-term. As previously discussed, Barron and Kenny (1986) established four conditions that must be satisfied for a mediation type relationship to exist. We closely followed the Baron and Kenney (1986) technique and model 4 (Table 2) reports the results of our test for mediation. In an attempt to provide a clear conceptual link between our test and the Baron and Kenney (1986) approach we also diagram our results in Figure 3. Figure 3 illustrates the strength of the various relationships between the variables, via regression coefficients. The key element here is the significance of the paths and ultimately the change in the strength of the relationships between ESP and CFP (paths C and C') in the presence of the innovation variable. Mediation exists if there is a significant reduction in the strength of the ESP-CFP relationship, as measured by the Sobel test, when innovation is present.

Barron and Kenny (1986) suggest that the first step to test for mediation is to examine the direct relationship between ESP and innovation (Path A) and we found it to be positive but not significant ($\beta = .14, p < .05$). Next we tested the direct relationship between innovation and CFP (Path B) and found it to be positive and significant ($\beta = .39, p < .01$). We then tested the direct relationship between ESP and CFP (path C) and our analysis revealed that this relationship was positive but not significant ($\beta = .08, p > .05$). Because there was not a significant direct relationship between ESP and short-term CFP it is not possible for innovation to mediate the ESP and short-term CFP relationship, there simply is not a significant relationship to mediate. Thus there is no evidence that innovation mediates the ESP-CFP relationship in the short-term and H4a is not supported.

Figure 3 about here

Long-term Financial Performance

In order to test our long-term performance hypotheses we again used four different regression models and these results are reported in Table 3. Hypothesis 1b proposes a positive relationship between ESP and long-term CFP. Model 2 revealed that there was a positive and marginally significant relationship between ESP and CFP ($\beta=.11, p < .10$), providing marginal support for hypothesis 1b. Next, we tested hypothesis 2b, which predicts a positive relationship between innovation and long-term performance. Model 2 provides support for H2b by indicating a positive and significant relationship between innovation and CFP ($\beta=.29, p < .01$). We then used model 3 to test hypothesis 3b which suggests that innovation would moderate the relationship between ESP and long-term CFP. Regression results indicated that there is a positive, but non-significant effect for the addition of the interaction term ($\beta= .03, p > .10$). Thus, innovation does not moderate the relationship between innovation and long-term performance, thereby H3b was not supported.

Table 3 about here

To test for the idea that innovation mediates the ESP and long-term CFP relationship we again utilized the Barron and Kenny (1986) technique and report our results in model 4 (Table 3) and illustrate them in Figure 4. Results show that the direct relationship between ESP and innovation (Path A) is positive and significant ($\beta=.14, p < .05$). The direct relationship between innovation and CFP (Path B) is also positive and significant ($\beta=.32, p < .01$). The relationship between ESP and CFP (Path C) is positive and significant ($\beta=.16, p < .01$). Finally, the strength of the relationship between ESP and CFP (Path C') is reduced in the presence of innovation ($\beta=.11, p > .05$). In order to claim mediation, the reduction in the strength of the relationship between ESP and CFP (Path C') must be statistically significant. We tested this difference between path C and path C' (Figure 4) using a Sobel test and found that the reduction was indeed significant, $Z = .02, p < .05$. Therefore, we find that innovation does in fact mediate the ESP-CFP relationship in the long-term and H4b is supported.

Figure 4 about here

Contrasting Short-term Versus Long-term Results

One of the goals of our research was to look at the differences in the ESP, innovation, and CFP relationships over time. To that end, we now compare the differences in results in our short-term and long-term analyses. For the effect of ESP on CFP we found that the relationship was not significant ($\beta=.01, p > .05$) while in the long-term it was significant at the .10 level ($\beta=.11$). Since we are using standardized coefficients we can directly compare the coefficients and this process reveals that there is a positive difference of .10 in the coefficients. This indicates that the impact of ESP on financial performance is becoming stronger over time. Next we compared the coefficients for the relationship between innovation and CFP. Here we find that this relationship was positive and significant in both the short ($\beta=.38, p < .01$) and the long-term ($\beta=.29, p < .01$) with a coefficient difference of .08. However, this difference represents a reduction in the strength of the relationship, indicating that the effect of innovation on CFP is growing weaker over time.

Next we compared the moderated relationships. For short-term CFP the moderated relationship was negative and marginally significant ($\beta= -.11, p > .10$) while in the long-term it was positive and not significant ($\beta=.03, p > .05$). What is interesting here is that the sign flipped from negative to positive, indicating that firms that invest a great deal of resources into ESP and innovation may suffer negative CFP effects in the short-term, but as time goes by that negative effect may turn positive. This is consistent with our findings for the direct relationships between ESP, innovation and CFP reported above.

Finally, we compared the mediated relationships. For short-term performance the mediated relationship did not exist. However, the relationship did exist in the long-term. This seems to indicate that innovation becomes the mechanism by which ESP impacts CFP, but that relationship takes time to emerge. When coupled with our other findings it appears that collective investments in ESP and innovation may hurt short-term CFP by way of a moderated effect, but in the longer-term innovation helps to improve the ESP-CFP relationship by way of mediation.

DISCUSSION

Implications for scholars

This paper extends the academic performance debate by asking not only does it pay to improve both environmental and social performance but it also asks a more specific question of ‘when does it pay?’ (King & Lenox, 2001; Orsato, 2006). With respect to this question, research has discussed that is important to take a contingency perspective (Barnett, 2007; Berchicci & King, 2007; Rowley & Berman, 2000) and that there may be a non-linear relationship between environmental and social performance and CFP (Peloza, 2009). Infact, Brammer & Millington (2008) find in a recent study that firms with unusually high as well as with unusually low social performance have a higher CFP than other firms. This U-shaped curvilinear relationship is akin to Porter’s (1985) ‘stuck in the middle’ phenomenon. Drawing on the resource-based view of the firm, we suggest that this contingency in the performance debate can be explained by different pay-back time horizons. Based in our empirical results, this can be explained as follows.

Our result of hypothesis 1a is consistent with scholars who found ambiguous findings concerning the ESP-CFP relationship (Margolis & Walsh, 2003; Orlitzky et al., 2003). When the focus is on the single relationship between ESP and short-term CFP we too did not find a clear relationship. However, the relationship between ESP and financial performance becomes significant when the focus is on the long-term (hypothesis 1b). This result supports our initial assumption that is important to include a temporal perspective when investigating the ESP-CFP relationship. We conclude that the relationship between ESP and financial performance is a time-dependent inverse-u-shaped relationship. As illustrated in Figure 5, CFP varies for a given level of investments in ESP-related resources depending on the time frame under consideration. In the short-term (within the one-year time-frame $0-t_1$), there is no distinct result between ESP and CFP, and the *type* of ESP activity may have differential effects on CFP. This means the realization of low-hanging fruits through increasing eco-efficiency has a positive effect in CFP while investments into expensive recourses required to develop new environmentally-sound products may result in a negative CFP.

Therefore, the short-term CFP focus of many studies may explain why the generalizability of the results appears to be difficult. In contrast, in the long-term (within the time-frame t_1-t_b) investments in ESP-related resources indeed seem to pay off. Research found that the development of a proactive environmental strategy can be the source for unique competitively

valuable organizational capabilities (Russo & Fouts, 1997; Sharma & Vredenburg, 1998). The acquisition and development of these capabilities takes time and thus the positive effect on CFP can be expected to be rather long-term. However, when only considering the ESP-CFP relationship, and not including innovation in the analysis, the literature has discussed that this positive effect might diminish again after a certain time (after t_b): ongoing investments in resources in order to maintain a high level of ESP may exceed cost savings generated from such activities (Sharma & Vredenburg, 1998) or competing firms may be able to imitate strong stakeholder relationships that initially provided some firms with a competitive advantage (Choi & Wang, 2009; Hillman & Keim, 2001). In sum, an important implication of our results is that the generalizability of results may be significantly increased by incorporating a temporal perspective when investigating the ESP-CFP relationship.

Figure 5 about here

Regarding innovation, our results are consistent with current research in the domain of innovation management: a positive relationship exists between innovation and CFP in both the short-term and long-term. However, the effect seems to weaken over time such that we observe a statistically significant change in standardized betas ($T=1.34$) between short-term and long-term performance. While there are many possible explanations for this effect, it is likely that the decreasing intensity of the innovation effect is due to the transient nature of innovation. Previous research has shown that innovations are often copied by competitors (VanderWerf & Mahon, 1997) and that knowledge spillovers allow copycat firms to erode innovators first mover advantage (e.g., Acs, Braunerhjelm, Audretsch & Carlsson, 2009). Our empirical results are consistent with these ideas and suggest that the effects of innovative behavior are generally positive, but have a greater impact on short-term performance compared to the long-term. This lends support to the dominant management thinking that for innovation to benefit the firm it should not be a onetime exercise, but rather a continuous effort (e.g., Baringer & Ireland, 2008).

The results of testing the substitution and complementary hypothesis contribute to a better understanding of the interplay between ESP, innovation, and CFP. Our results with respect to ESP, innovation, and short-term CFP are similar to those of Hull and Rothenberg (2008) who found a negative moderating effect of innovation on corporate social performance

and short-term CFP. We conclude that in a short-term horizon, firms with limited resources are faced with a choice between investments in innovation or investments in ESP. Simultaneous investments in resources that allow for both activities generate higher costs to include management's time and attention and, thus, harm CFP in the short-run. We deduct that the full benefit of investments in both innovation and ESP does not accrue immediately but takes time to pay off. Notably, the moderating effect in the short-term, but it is not a time-consistent effect. In the long-term, innovation has a mediating effect. As such, investments in ESP-related resources without any simultaneous investments in resources that trigger a firm's innovativeness might result in diminishing CFP, as postulated under the time-dependent inverse-u-shaped relationship proposition. However, the combination of investments in resources that enhance ESP and innovation result in superior financial performance and may lead to a sustained competitive advantage. In sum, innovation acts as the organizational action through which investments in ESP can achieve substantial and sustainable improvements of CFP.

In the academic debate regarding whether it pays to be good/green, there is also much confusion with respect to the utilized terminology and applied performance measurements. We suggest that using precise and consistent terminologies within this debate could significantly reduce this confusion. Some authors implicitly follow this line by focusing their investigation on corporate eco-efficiency (Derwall et al., 2005) or corporate charitable giving (Brammer & Millington, 2008). When generalizing the results, such studies are limited by their theoretical and managerial implication to the specific focus of the study. For example, the eco-efficiency literature proposes that corporate efforts to enhance a firm's eco-efficiency should – if successfully implemented – optimize a firm's production processes by a reduction of the material and energy flows and simultaneously achieve cost benefits (DeSimone & Popoff, 1997). As such, research in this area can empirically test the cost-effectiveness of specific corporate activities. However, general statements as to whether corporate environmental performance, or even corporate social responsibility, pays off cannot be precisely derived. For studies investigating general questions as whether the environmental, social, or ethical efforts of a firm result in better CFP, we suggest using a clearly-defined construct. Using the widely accepted Brundtland Report (WCED, 1987) to anchor our definition of 'sustainability', we then separated the financial component and defined ESP as an equally balanced construct of a firm's environmental and social performance. We hope that this new construct can prevent further confusion regarding the terminology and performance measurements in future research.

Managerial implications

Our results reconfirm the important role of innovation: in the short-term, managers may be forced to choose between investments in resources that enhance the firm's ESP or innovation. As such, from a short-term profit maximizing strategy, managers have to decide in which areas it is better to invest, innovation or ESP. Two basic situations are possible: On the one hand, the essential resources to identify and realize eco-efficiency potentials are likely to be acquired at a low cost and with minimal effort. For example, the World Business Council for Sustainable Development³ offers a great deal of publicly available information and easily implementable tools as to how firms can reap such low-hanging fruits. In such cases, it is a firm-specific trade-off situation whether to invest in resources that enhance its ESP or innovativeness. On the other hand, in order to develop and implement a highly sophisticated and supply-chain-wide ESP strategy usually requires significant managerial effort and costs. In such cases, a purely short-term CFP driven management strategy would be preferential to investing in resources that enhance the firm's innovativeness.

However, in a more strategic (i.e., long-term) perspective, the complementary hypothesis holds; which is that innovation is a key to maximizing the effects of ESP initiatives on financial performance. Thus, managers focused on long-term value creation may be well advised to direct resources to increase both ESP and innovativeness. Innovative organizations and innovative teams create and adopt innovative products, services, and processes and this is likely the key mechanism to unlocking the true potential of ESP's impact on long-term financial performance. For example, it is certainly possible for a firm to identify future consumption patterns and respond with new environmentally benign products and services. Such a firm anticipates future conditions of the business environment twice; by an early incorporation of customers' needs and by an adequate reflection of natural environment and socially related business constraints. In sum, it is important for corporate managers to realize that a competitive advantage requires investments in both ESP and innovation, and these are long-term investments versus quick-fixes.

³ <http://www.wbcsd.org>

Limitations and future research

Regarding the ESP-CFP relationship, our results suggest that scholars should look at the different impacts on short-term versus long-term CFP while recognizing the interactive role of innovation. Although our intention was to construct an ESP score that equally weights environmental and social dimensions, investigating specific constructs within these dimensions and their effect on CFP may further shed light on this triptych inquiry. For example, it could be investigated whether there is a difference when just considering output-based environmental performance data (e.g., a firm's level of greenhouse gas emissions) and process-based management indicators for ESP (e.g., the sophistication of a firm's carbon management) (cf., Ginsberg, 1988). It could be the case that more symbolic actions differ from substantive efforts in terms of a firm's short- and, notably, long-term CFP (cf., Berrone, Gelabert & Fosfuri, 2009).

Moreover, we introduced a time-dependent inverse-u-shaped relationship between ESP and CFP. As a limitation, we did not test for diminishing CFP at the end of the curve. Future research could empirically investigate whether this possibility actually occurs. Furthermore, since our data suggests a mediating relationship in the long-run, more inductive-based studies investigating how innovation acts as mediator between ESP and CFP seem especially relevant. Lastly, researchers should investigate whether these results hold during a time of global economic crisis as this data was gathered prior to entering the worst of the recent recession and scholars argue that specific value-creating resources may also be the sources of losses in times of financial turmoil (Choi & Wang, 2009; Leonard-Barton, 1992). While many publicly traded firms have experienced a sharp decline in their performance and equity, researchers could investigate the degree to which investments in ESP and innovation either hinders or buffers (Thompson, 1967) firm performance during periods of heightened uncertainty.

CONCLUSION

The purpose of the triptych inquiry of ESP, innovation, and corporate financial performance was to empirically explore when it pays for firms to address the first two challenges of sustainability – environmental integrity and social equity. We have expanded upon previous work in this area by investigating two time-related performance periods and emphasized the interaction effect of innovation. The results suggest that it pays to increase a firm's level of ESP when firms have the ability to innovate *and* when the financial goals are not limited to short-term planning horizons. We conclude that for innovative firms, there is no mutual exclusivity between corporate environmental, social, and financial performance. These dimensions are collectively reinforcing and can contribute to the long-term survival of the firm in competitive markets and within its natural and social environment.

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TABLES and FIGURES

Table 1: Descriptive Statistics and Correlation

	Mean	SD	1	2	3	4	5	6	7
1. Size	4873.23	1.46	--						
2. Risk	1.14	.16	.01	--					
3. ESP	.07	.99	-.34**	-.05	--				
4. Innovation	254.35	702.88	-.21**	-.16**	.14*	--			
5. ESP * Innovation	1	0	.43**	-.11	.38**	-.33	--		
6. Tobin's q (04)	2.17	1.34	-.10	-.02	.08	.39**	-.13*	--	
7. Tobin's q (05-07)	2.07	1.06	-.08	-.10	.15**	.32**	-.02	.81**	--

N=252

Table 2: Regression Results for Short-term CFP (Tobin's q - 2004)

Short-term Performance (reporting standardized betas)

	Model 1 (Control)	Model 2	Model 3	Model 4	
Firm size	-.082	-.012	.027		
Risk	.012	.057	.045		
ESP		.009	.020		
Innovation		.376**	.381**		
ESP * Innovation			-.116+		
Mediation:					
Path a				.14*	
Path b				.39**	
Path c				.08 (ns)	
Path c prime				n/a	

(**< .01, * < .05, + < .10)

(industry dummies not reported)

Table 3: Regression Results for Long-term CFP (Tobin's q - avg. 2005-2007)

Long-term Performance (reporting standardized betas)

	Model 1 (Control)	Model 2	Model 3	Model 4	
Firm size	-.081	.002	.061		
Risk	-.086	-.048	.023		
ESP		.112 ⁺	.053		
Innovation		.293**	-.039		
ESP * Innovation			.028		
Mediation:					
Path a				.14*	
Path b				.32**	
Path c				.16**	
Path c prime				.11 ⁺	

(** < .01, * < .05, + < .10)

(industry dummies not reported)

Figure 1: ESP, Innovation, and two Measures of CFP

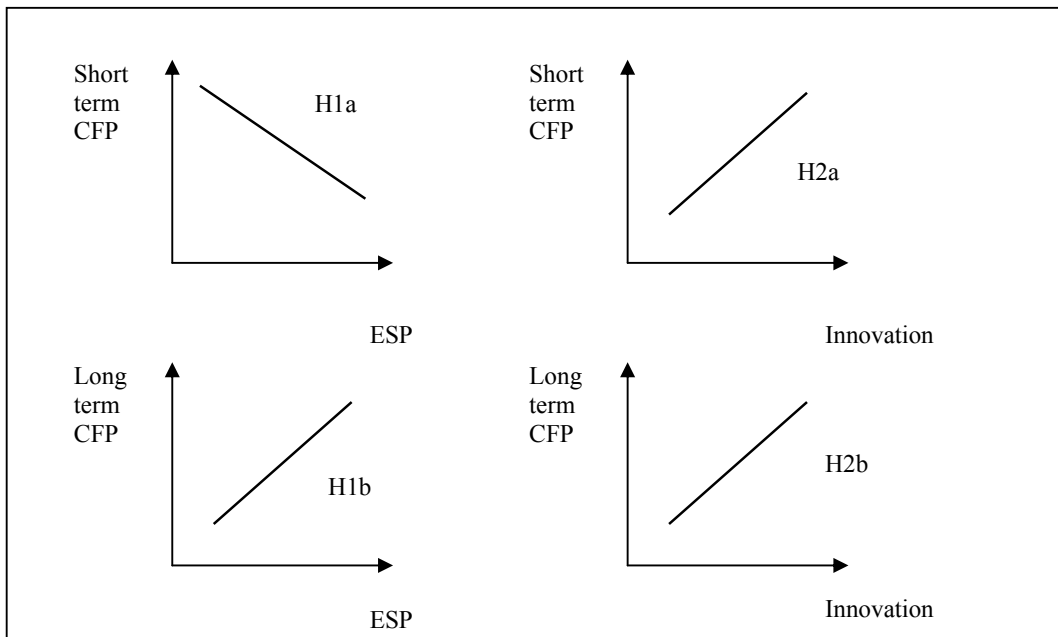


Figure 2: The Moderating Effect of Innovation on ESP and CFP

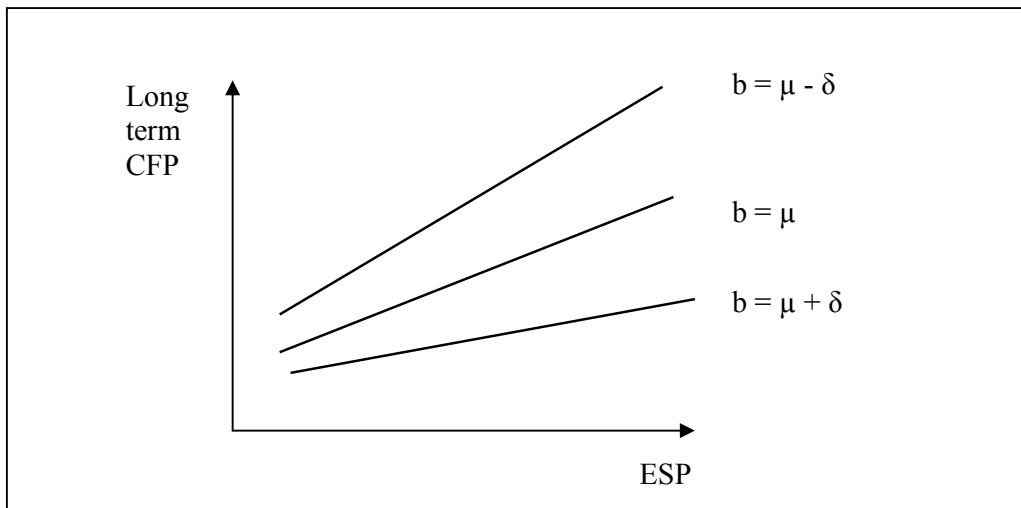
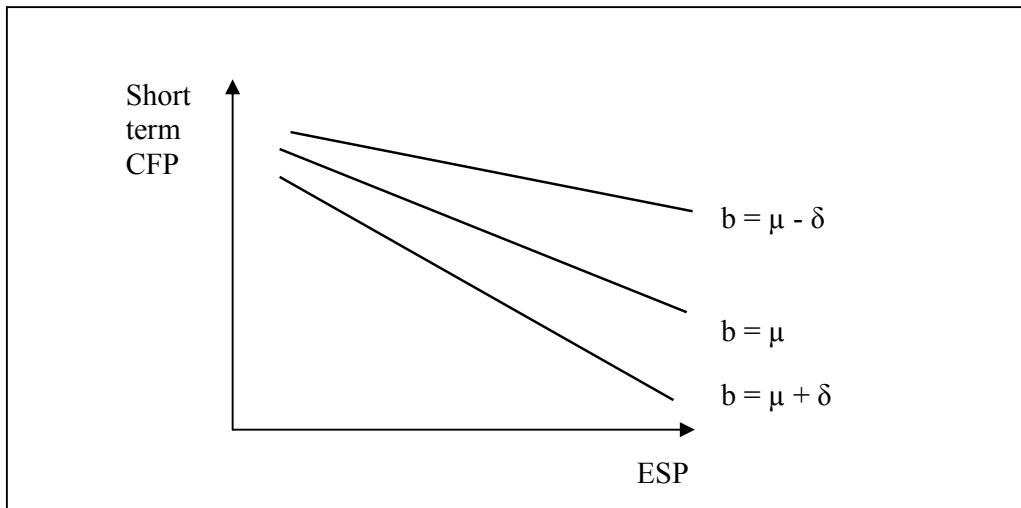
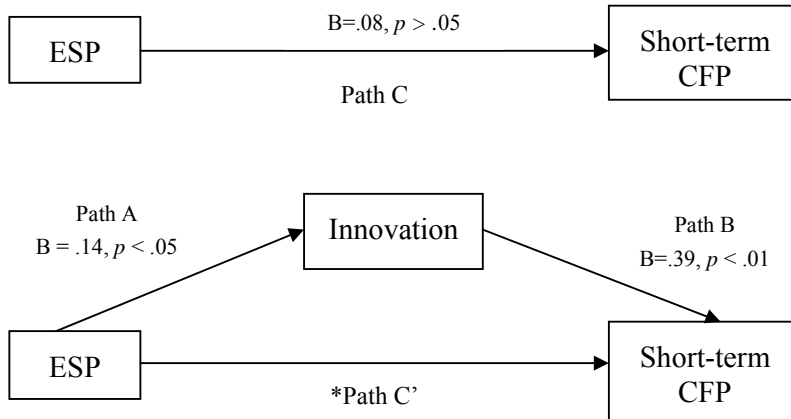
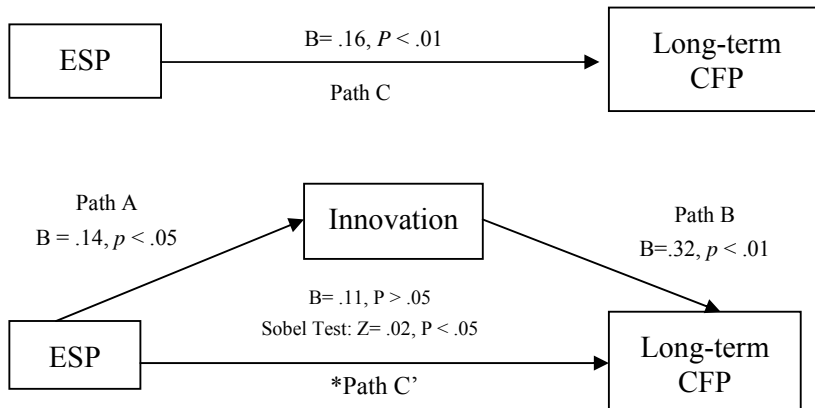


Figure 3: Mediated Model of ESP, Innovation, and Short-term CFP



*Since Path C is non-significant, Path C' cannot exist – indicating no mediation (Barron and Kenney, 1986).

Figure 4: Mediated Model of ESP, Innovation, and Long-term CFP



* Path C goes from highly significant to non-significant in Path C'. This difference is statistically significant – indicating mediation exists (Barron and Kenney, 1986).

Figure 5: Time-dependent inverse-u-shaped relationship between a given level of investments in ESP-related resources and CFP

