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道德意識、企業環境策略與經濟績效之分析

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摘要

隨著人類經濟發展的高度重視及殷切期望，工業化活動正無秩序的蔓延與擴張，以致生態環境飽受衝擊與失衡，此現象突顯了人類保護自然環境的迫切性，並驅使企業日益重視企業社會責任(corporate social responsibility，簡稱 CSR)的重要性。本研究使用部份最小平方分析法(partial least squares，簡稱 PLS)建構經理人員之道德意識、高階管理階層支持與創新環境策略對於企業經濟績效之影響。從 158 位受測樣本中，本研究發現道德意識較高之高階管理者能有效提升該部屬之理想道德主義，進一步培養環境認知，呼籲部屬共同重視環境議題，這將有助於加強並促使企業在營運過程中致力於環境責任相關活動。研究結果尚指出，環境認知較高之企業積極地實行環境預防策略，此積極性預防策略所產生之經濟績效將優於被動性控制策略所產生的績效。此外，企業高階管理階層對企業環境責任活動的支持亦能有效鼓動企業採行創新環境策略。由此可見，在培育經理人個人道德價值，以及提升高階管理階層對社會環境活動支持兩者雙管齊下，企業不僅能善盡企業社會責任，亦能有效提高的財務績效。本研究貢獻在於提供道德意識、高階管理階層對企業環境責任活動的支持以及經濟績效等相關文獻一系列新的研究發現。尤其以台灣為研究樣本，更有助於我國企業在落實企業社會責任活動時有一套新的策略方向，例如訓練經理人員道德意識之養成、倡議高階經理人支持社會環境活動，並將環境責任納入營運策略目標，共同落實社會責任並達到最大效益。

關鍵詞：道德意識、環境認知、創新環境策略、財務績效

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The Relationship Among Moral Consciousness, Corporation's Environmental Strategy, and Economic Performance

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Abstract

The prevalence of ecological initiatives in daily operations was examined to understand the relationship among moral consciousness, environmental perceptions, conservation support from top managers, innovative environmental strategy, and financial performance. Drawing on comprehensive environmental managerial practices, this study employed partial least square (PLS) path modeling to estimate both the direct and the interaction effect on innovative environmental strategies for pollution prevention and control. Data were collected from 158 manager respondents in Taiwan. The results indicated that the ethic of senior managers has a tremendous and positive impact on subordinates' idealism and facilitates their perception of the importance of environmental issues. Such perceptions dramatically affect subsequent policy and procedures concerning innovative environmental strategies for pollution prevention and control. This paper demonstrated empirically that the higher a firm's level of innovation in proprietary pollution-prevention technologies, the larger the financial advantage it gains from proactive

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environmental strategies. This article contributes to the understanding of moral philosophy and environmental strategic management, particularly in the context of Taiwan.

Keywords: Moral consciousness; Environmental perceptions; Innovative environmental strategy; Financial performance

1. Introduction

Concerns about corporate social responsibility (CSR) have grown significantly during the last several decades (Carroll 1991). Not only has the issue been investigated in the business press and among business and political leaders (Buhr and Grafstrom 2004), but a body of existing academic literature have also focused on the drivers of new business imperatives and new social demands (McWilliams and Siegel 2002). Different CSR concepts have been elaborated in order to identify the role of business in relation to society. Initially, Friedman (1970), with a narrow neoclassical firm paradigm, argued that the responsibility of business is to use its resources and engage in activities designed to increase its profits as long as it stays within the rules of the game; therefore managerial decisions should consider only shareholders' interests. Many authors have long advocated for economic responsibility being inseparable from legal, ethical and discretionary responsibilities (Carroll 1991; Gond and Crane 2009). Dahlsrud (2006) suggested that CSR involves five primary dimensions: economic, environmental, social, stakeholder, and voluntary factors. Egri and Ralston (2008) subsequently categorized corporate responsibility into CSR, environmental responsibility, ethics, and governance. Besides, Bowen (1953) conceptualized CSR as a social obligation to pursue those policies, make those decisions, or follow those lines of action that are desirable in terms of the objectives and values of our society (Maignan and Ferrell 2004). Kitzmueller and Shimshack (2012) also suggested that CSR activists are driven by two opposing perspectives, extrinsic and intrinsic preferences, and the CSR mechanisms related to induced innovation, moral hazard, shareholder preferences, and labor markets.

The research into CSR has primarily employed stakeholder theory (Freeman, 1984), with CSR frequently characterized as a business philosophy influencing corporate strategy and enacted in response to stakeholder interests or demands (Carroll 1999; McWilliams and Siegel 2002; Salam 2009). Recent studies have

highlighted the pressures from various stakeholder groups as triggers for firms to effectively incorporate sustainability issues into their environmental management schemes (Lee and Ball 2003; Perez-Sanchez et al. 2003; Nawrocka 2008; Kitzmueller and Shimshack 2012). Bacallan (2000) pointed out that the corporation struggles to manage the environmental impacts of its operating activities. Bansal and Roth (2000) studied why firms go green; Waddock et al. (2002) argued that stakeholder pressures drive large organizations to invest in total responsibility management systems; and Huang and Kung (2010) provided evidence that corporations view environmental disclosure as a means to mitigate stakeholder environmental pressure in advance of stricter environmental regulations or legislation in the future. Furthermore, Menguc et al. (2010) advocated that managers will allocate more resources and budget to environmentally friendly strategies to enhance the sales and profit growth of a firm. Kitzmueller and Shimshack (2012) noticed that environmental innovation may constitute a “win- win” in the dynamic market economies. Even so, few studies have considered the importance of moral consciousness and perceptions of innovative environmental strategy. For this reason, we have addressed the complex relationship between moral consciousness and innovative environmental strategy.

Despite its potential impact, little is known about the moral philosophy of managers involved in a broad array of CSR activities might influence relationship with environmental strategy regarding ethical decisions related to ethical dilemmas. Personal values have been proposed as one potential precursor to ethical behavior in organizations (Weber 1993). McGuire et al. (2003) concluded that strong social performance may be driven primarily by managerial beliefs. Therefore, in the present research, we propose that the moral consciousness of managers at all levels is a driver of environmental strategy because their actions and decisionshave consequences for other people and usually involve ethical dilemma. To date, few researchers have examined, at the awareness level, the perceptions of substantiality

with regard to environmental issues. In practice, the success of a corporation's environmental strategy depends on the business environment in which it operates. Aragon-Correa (1998) found that a corporation's strategy type or posture was related to its approach to the natural environment. If the members of a corporation are aware of their environmental responsibilities, they may be inclined to adopt a proactive environmental strategy. Aiming to enhance the knowledge base on this topic, we looked at general perceptions of environmental issues as well as how these issues relate to other socioeconomic concerns.

Regarding management initiatives, one question that has attracted the attention of researchers and practitioners is whether competitive advantages and opportunities are associated with environmental management. In this sense, the relationship between environmental proactivity and business performance has been analyzed based on economic rationale (Epstein and Roy 2001; Salzmann et al. 2005). In particular, researchers have found that organizations will adopt green supply chain management practices if they identify that doing so will result in specific financial and operational benefits (Bowen et al. 2001). Porter and van der Linde (1995) pointed out that innovative technology aimed at eliminating the pollution that has resulted from the inefficient use of natural resources can promote resource productivity and offset the environment costs; it even helps enterprises gain competitive advantages in the market. Based on participant responses about concerns associated with the natural environment, innovative environmental strategies can be classified as pollution-prevention or pollution-control perspective (Hart 1995; Hart and Ahuja 1996; Russo and Fouts 1997). In addition, sustainable management practice are expected to increase an organization's market share and return on investment (Shin et al. 2000; Prasad and Tata 2000) and improve the organization's overall competitive position (Carr and Person 1999; Stanley and Wisner 2001; Kitzmueller and Shimshack 2012). In response to this stream, there is a clear need to establish the potential link between innovative environmental

strategies. A contemporary area of interest in this regard is the impact of environmental responsibility on economic performance, and increased competitiveness, and provision of an impetus for organizations to environmentalize their operations.

Interestingly, an original source of debate in the CSR literature has been the direction of causality between the firm's financial performance and its social behavior. More to the point, scholars and theorists have deliberated about whether CSR is an independent or dependent variable in the relationship between CSR and financial performance. Although the debate is ongoing, the existing research seems to be moving toward common ground. According to Margolis and Walsh (2003), 109 of 127 papers they reviewed, suggested CSR as a predictor of firm financial performance but not as a dependent variable. Thus, the underlying premise of this research is to explore corporate CSR as a determinant of financial performance. Belief in this causal direction rests on the theory that higher levels of CSR lead to improved financial performance, which offers the possibility of reinvestment in socially responsible behavior, such as pollution reduction efforts or energy-saving technologies.

In summary, this article employed a review of the literature from CSR and environmental management practices as well as stakeholder theory for conceptualizations. It used partial least square to explore the interactive impact of moral consciousness rooted in managers, environmental perceptions, as well as conservation support from top manager on innovative environmental strategy, and to further inspect and assess the directional relationship between innovative environmental strategy and financial performance. Relatively few studies have synthesized these views by focusing on CSR practices and outcomes in the environmental strategy. This study, which investigated the application of moral consciousness in managers to innovative environmental strategy and financial performance, is particularly relevant for organizations because the findings, have potential implications for practitioners. This research contributes to the empirical

literature on the relationship between CSR and corporate financial performance by providing the first comprehensive evidence from environmental management.

Based on an extensive literature review in the following section, we identify the main theoretical arguments and develop a set of hypotheses on the relationships among moral consciousness, environmental strategy, and economic performance. We then describe the methodology, empirical results and robustness checks. Finally, we discuss our results, highlight managerial implications, and outline limitations and future research opportunities.

2. Literature review and research hypotheses

Carroll (1991) definedCSR as organizational activities that meet the ethical and discretionary responsibilities expected by society. Prior literature has explored the drivers of CSR (e.g., Carter and Jennings 2004; Swanson 2008; Menguc et al. 2010), and we extended these insights to investigate the essential motivation that triggers innovative environmental strategy, including innovations related to pollution prevention and control.

2.1. Ethics of top managers and individual moral philosophy

Ethical concerns are important in business practices and research endeavors in the field of corporate management. Ethical considerations are multi-faceted and can be applied to activities and decisions that relate to corporate actors, employees and other constituencies affected by a corporation's operations. Stakeholder theory directs managers acting as a critical interface with important stakeholders to incorporate ethical deliberation into their decision-making (Swanson 1999; Freeman and Liedtka 1991; Doh and Guay 2006; Enquist et al. 2006; Morsing and Schultz 2006) and to pay attention to decision consequences for other people (Mele 2008). Somewhat similarly, Carroll's (1991) CSR pyramid suggests that perceived ethical responsibility includes expectations of being a good corporate citizen (e.g.,

contributing to the well-being of others); this demonstrates that CSR challenges prevailing ideology and raises new ethical imperatives for managers (Carroll 1999). Drumwright (1994) also showed that environmental initiatives are often driven by individual values and commitment to a cause. Consequently, policy makers at all levels who trying to improve the CSR of business practices transfer CSR initiatives beyond the individual through innovative environmental practices; this is accomplished by developing policies that explicitly outline the corporation's desire to engage in CSR (Carter and Jennings 2004; McGuire et al. 2003). Thus, we extended this insight to suggest that environmental programs are driven by managers' individual morals.

Personal moral philosophy is defined as a set of beliefs, attitudes, and values that provide a framework for considering ethical dilemmas (Barnett et al. 1994), and they offer guidance to individuals as they make ethical judgments (Hunt and Vitell 1986; Forsyth and Nye 1990; Weber 1993). However, some have argued that top managers' beliefs and behaviors communicate strong messages (Sims and Brinkmann 2002) and influence subordinates' values, beliefs, and aspirations, as well as the corporation's extended programs and initiatives (Yukl 1989; Stead et al. 1990); historically, they have even shaped a corporation's values and orientation, which are not easily changed (Kabanoff and Holt 1996; Berry and Rondinelli 1998). In particular, top managers exert potential influence on decisions (Brammer and Millington 2003; Trevino et al. 2008; Burton and Goldsby 2009). For example, a top manager's unethical behavior has been shown to have grave consequences for the corporation and its surrounding (Gillespie and Dietz 2009), especially in ethically uncertain and ambiguous areas are that not explicitly delineated in corporate policy (Turner et al. 1994). Therefore, based on the linkages between the ethics of top managers and managers' individual personal morals, the following hypothesis was constructed:

H_1: The ethics of top managers will influence managers' individual personal morals.

In our discussion with a focus on Forsyth's (1980) taxonomy, idealism reflects the beliefs that ethical judgments are morally absolute in terms of moral principles, norms, or laws; moreover, relativism reflects the belief that all moral standards are relative to a society and culture and that moral judgments and actions depend on the nature of the situations and circumstances. In this context, Vitell et al. (2010) observed that corporate ethical values are positively correlated with idealism, but negatively correlated with relativism; this result is consist with Singhapakdi et al.'s (1999) demonstration noting that managers in corporations with higher levels of ethical values should have higher moral standards than those in corporations with lower levels of ethical values, and these managers should be more committed to idealism and rely more on rules and guidelines. Thus, we amended H_1 to the following:

$H_{1\ (amended)}$: *The ethics of top managers are positively related to idealism, but negatively related to relativism.*

2.2. Moral consciousness and environmental perceptions

From the angle of Forsyth's (1980, 1992) personal moral philosophy model, we inferred that CSR is driven mainly by well-intentioned, "idealism" managers because they are thought to be more other centered, altruistic, and unselfish than relativists (Forsyth 1992; Park 2005) and to insist that one must always avoid harming others. This inference was also supported by Davis et al. (2001); they found idealism to be positively related to empathy, empathic concern, and perspective taking. As such, idealists can be viewed as more closely aligned with Kant's deontological views, which center on moral absolutes and treating people with dignity and respect, never as a means to another's ends (Forsyth 1992; Hosmer 2008). Furthermore, in a study of socially responsible procurement, Park (2005) found that idealism positively relates to the importance of ethics and social responsibility. Similarly, idealism also has been found to be positively related to the

perceived importance of ethics and social responsibility (Etheredge 1999; Singhapakdi et al. 1999) and ethical judgment (Singhapakdi et al. 1999). Accordingly, we suggested that idealist will more sensitively perceive the importance of environmental issues and that the awareness of particular environmental, social and ethical issues directs idealists to ethical choices (Mintel 2004). Therefore, we constructed hypothesis 2 as follows:

H_2: Idealism has a significantly positive relationship with environmental perceptions, but there is a negative relationship between relativism and environmental perceptions.

2.3. Environmental perceptions as drivers of innovative strategy

One motivation for implementation of environmental policy is individual concern (Bansal and Roth 2000). Individual behavior is believed to be affected by the beliefs and attitudes of the individual (McGuire et al. 2003) and, for some, by the treatment the environment receives. Metaphorically, it is expected that those who are aware of environmental issues and concerned about the impact of their business on the environment will be more likely to act to reduce the impact of their business activities (Gadenne et al. 2009). More specifically, managers will be more likely to engage in environmentally friendly processes and procedures, such as recycling, waste management, and energy conservation, because of environmental concerns than regulatory requirements (Hillary 1999) or profit-seeking. Consequently, an attempt was made here to study the extent to which environmental knowledge and awareness affect innovative environmental undertakings.

Porter and van der Linde (1995) indicated that innovative technology can promote resource productivity and competitiveness. In this content, a corporation's innovative environmental strategy can be classified as pollution prevention or pollution control (Hart 1995; Hart and Ahuja 1996; Russo and Fouts 1997). The first approach focuses on the prevention of waste, emissions, and pollution, while the

second approach emphasizes the control of an end-of-pipe approach (Aragon-Correa and Sharma 2003; Hart 1995). In practice, the success of a corporation's environmental strategy type or posture depends on the business environment in which it operates and its approach to the natural environment (Aragon-Correa 1998). If the members of a corporation perceive that they have environmental responsibilities, they may be inclined to adopt a proactive environmental strategy. Therefore, a proactive environmental strategy has been viewed as a corporation's innovative activities related to pollution prevention (Aragon-Correa and Sharma 2003). As a result, we formulated the following hypothesis:

H_3: Perception of the importance of environmental issue is more likely to result in a pollution-prevention strategy than a pollution-control strategy.

2.4. Top managers' support as a driver of innovative strategy

Previous studies have acknowledged that the support of top management has a vital effect on CSR activities (Hart 1995; Weaver et al. 1999; Quazi 2003; Swanson 2008). In particular, Lambert et al. (1998) suggested that top management support is important to green management activities. Top management bears the responsibility of creating and maintaining a culture that supports socially responsible behavior through action (Murphy and Enderle 1995). Berry and Rondinelli (1998) declared that top managers' support can shape a corporation's values concerning issues related to the natural environment, and Dechant and Altman (1994) noted that environmental leaders inspire a shared value of seeing the corporation as environmentally sustainable and able to create and maintain green values involvement in environmental issues reflects top management's commitment to such issues with respect to communicating and addressing them (Pujari and Wright 1996), initiating environmental programs and policies (Cahan and Schweiger 1993), rewarding employees for environmental improvements, and contributing corporate resources to environmental initiatives (Berry and Rondinelli 1998). As a result, we

regarded top management's support of natural environmental issues as an important dimension of an environmental strategy. Therefore, we hypothesized the following:

H_{4a}: *Top management support is positively related to the innovation of a pollution-prevention environmental strategy.*

H_{4b}: *Top management support is positively related to the innovation of a pollution-control environmental strategy.*

2.5. Innovative environmental strategy and financial performance

The aspect addressed in this section involves the impact of CSR activities on financial performance, triggered by environmental strategies. Corporations worldwide are continuously trying to develop new and innovative ways to enhance their competitiveness. Bacallan (2000) suggested that corporations are enhancing their competitiveness through improvements in their environmental performance to comply with mounting environmental regulations, to address the environmental concerns of their customers, and to mitigate the environmental impact of their production and service activities. This basic rationale is supported by instrumental stakeholder theory (Donaldson and Preston 1995; Freeman 1984), which suggests that CSR activities may be a corporate device that leads to more effective use of corporate resources (Orlitzky et al. 2003); this in turn leads to better financial performance (Freeman 1984; Hillman and Keim 2001) by attracting socially responsible consumers (Bagnoli and Watts 2003), buffering the corporation from unforeseen problems, providing valuable new opportunities (Fombrun et al. 2000), alleviating the threat of regulation (Lev et al. 2010), improving the corporation's reputation (Orlitzky et al. 2003), or easing the concerns of activists and non-governmental corporations (Baron 2001).

From this perspective, environmental management is not seen as a separate function; instead, it is seen as an integral part of running the company, even of

improving overall financial performance. Most empirical research has focused on environmental practices through which such proactivity is manifested. For instance, Hart (1995) demonstrated that environmental management affects current competition and that environmentally oriented resources and capabilities have the potential to generate sustainable competitive advantages. In the same vein, Russo and Fouts (1997) emphasized that high levels of environmental commitment are associated with enhanced profitability, this relationship being stronger in industries showing high levels of growth. Christmann (2000) also pointed out the potential of certain environmental management practices in achieving low-cost and differentiation advantages. Menguc et al. (2010) suggested that managers will allocate more resources and budget to socially and environmentally friendly strategies to enhance the sales and profit growth of a corporation. Panapanaan, et al. (2003) indicated that globalization, regulation, and sustainable development have fueled the expansion of CSR. Most notably, innovative environmental strategies have become critical in establishing value-added content for products and a vital determinant to ensure the profitability and survival of a company. We perceived that this effort is further complicated if environmental and social issues are taken into account (Seuring 2004), although innovative environmental strategy can promote efficiency and synergy among business partners and their lead corporations and helps to enhance environmental performance, minimize waste, and achieve cost savings. This synergy was expected to enhance the corporate image, competitive advantage, and marketing exposure. This drew forward the following hypothesis:

H_5: Innovative environmental strategy is positively associated with corporate financial performance.

To assess commercial success (growth, market share) and financial success (profitability), we use relative measures of the corporation's absolute sales revenues, three-year sales revenue growth, and profit versus other companies performing the

same line of work, as well as relative market share. These indicators are thought to have a distinctly different relationship with sustainability at the corporate level (Porter and Van der Linde 1995). The linkages between environmental strategy and each of these outcomes necessitated revision of Hypothesis 5 and Hypotheses 5a through 5d, as follows:

$H_{5a\text{-}5d}$: *Innovative environmental strategy is positively associated with corporate sales revenues, three-year sales growth, profitability, and market share.*

3. Research methodology

3.1. Variables and measures

This study implemented a letters-based questionnaire to test the mentioned hypotheses. It drew on the conception of top managers' ethics recommended by Forcht (1987) and Vitell and Davis (1990); items were also adapted from Jin and Drozdenko (2010). This section encompassed nine items that were rated on a 7-point Likert scale (1 = strongly low, 7 = strongly high) to evaluate the ethics of top managers. In addition, this study used the concept of moral consciousness, which is measured by the ethics position questionnaire (EPQ) (Forsyth 1980), which contained a list of 20 short statements: 10 measuring idealism and 10 measuring relativism. Managers' conservation awareness, perception, and interest were measured by eight conservation-related attitudes and practices described using a 7-point scale (1 = does not describe me at all, 7 = describes me perfectly). Similarly, we used four items and a 7-point scale to measure the extent to which top management was seen to play a critical role in shaping values and orientation toward environmental strategy (Menguc et al. 2010). In addition, environmental strategies were measured by asking participants to rate the prevention of wastes (sixteen items), prevention of emissions (ten items) and an end-of-pipe approach (six items) in the business operation process. Finally, financial performance indexes were based on the

extent to which the corporation had manifested environmental strategy versus its peer competitors.

Because firm-level characteristics might affect the relationships between CSR-related activity or its dimensions and firm-level outcomes, a set of control variables was modeled as linked to financial outcomes. We also considered firm size and industry type in the observed model to control the potential influences of firm size and industry characteristics. Firm size may reflect the resource base that firms have to "throw at" social responsibility issues, and prior research has provided evidence that small firms are less able than large ones to communicate their social-related activities externally. From industry to industry, social norms may yield greater or lesser levels of importance being allocated to social responsibility related issues. The results indicate a non-significant effect on the relationships among environmental strategy and economic performance.

3.2. Data and samples

The questionnaire survey was pre-tested by academics and practitioners to assess face validity (Heeler and Ray 1972). Any ambiguous or unrelated questions were reworded or eliminated. A pilot test with 30 environmental professionals was conducted. Included in the pilot test was an open discussion of the model. The survey items were amended to operationalize the constructs effectively. The reliability of the scale items was assessed by an analysis of the pilot data. In the main survey, we first identified the top 800 corporations, covered in the Taiwan Economic Journal (TEJ) database that had the highest market capitalization, excluding the financial and utilities industries. In addition, 200 questionnaires were sent to environmental professionals dawn from private corporations. In addition, 158 pieces of usable data (response rate of 15.8%) were obtained from 1,000 managerial respondents in Taiwan. Among the returned survey instruments, 39% of respondents had 200 employees or less, 23% of the respondents had 201 to 500 employees, and

38% had 501 or more employees. The responding organizations were from the manufacturing (92%) and service (8%) sectors, and 33% were sole proprietorships or family businesses, 50% were public listed companies, and the remaining 17% were joint ventures. Concerning annual sales, approximately 41% of the firms had revenues of less than NT$15 billion, 34% had revenues of NT$16 billion to NT$50 billion, and 25% had revenues greater than NT$50 billion. Based on the returned survey instruments, it appeared that respondents primarily represented medium-sized to large public companies in the manufacturing industry.

3.3. Validation of the Measure

The adequacy of the measurement model was determined by examining internal consistency and discriminant validity. We evaluated the internal consistency of model construct by using the composite scale of reliability (CR) and average variance extracted (AVE) (Chin 1998; Fornell and Larcker 1981). CR is a measure analogous to coefficient alpha and is used to estimate the internal consistency of a latent variable, whereas AVE is used to estimate the amount of variance captured by a construct's measure relative to random measurement error (Fornell and Larcker 1981). As shown in Table 1, the CRs ranged from 0.943 to 0.977, whereas the AVEs ranged from 0.664 to 0.825. All of the above results were greater than the recommended cut-off levels of 0.70 and 0.5, respectively (Fornell and Larcker 1981; Hair et al. 1998).

Table 1 Measurement Construct and Reliabilities

Construct		CR	AVE	Cronbach α
Ethics of top managers		0.977	0.825	0.973
Moral consciousness	Idealism	0.970	0.764	0.962
	Relativism	0.961	0.713	0.956
Top management support		0.943	0.807	0.920
Environmental perceived		0.973	0.818	0.968
Environmental strategy	Innovation of pollution-prevent	0.952	0.664	0.943
	Innovation of pollution-control	0.961	0.805	0.951

Notes: CR donates Composite Reliability; AVE donates Average Variance Extracted value.

Most items had standardized loadings ranging from 0.700 to 0.946, greater than the recommended cut-off of 0.7 (Nunnally 1978), and demonstrated adequate convergent validity. Consequently, we concluded that the data were indicative of good internal consistency (Nunnally 1978). Meanwhile, the discriminant validity of measures can be assessed using multiple methods. A construct should share more variance with its measures than it shares with other constructs in the model (Chin 1998). Therefore, the square root of the AVE should exceed the intercorrelations of the construct with additional constructs in the model (Anderson and Gerbing 1998; Fornell and Larcker 1981). As shown in Table 2, all of the constructs exhibited significantly higher rates than the stipulated criteria, thereby indicating satisfactory discriminant validity.

4. Analysis and findings

Based on our prior theorization and inferences, we modeled a theoretical nexus containing a higher order construct with multiple formative and formative specifications, the more commonly used covariance-based structural equation models techniques were thought to be problematic. As noted, such techniques could result in identification problems (MacCallum and Browne 1993), and covariance-based SEM was unadvisable due to the sample sizes of our dataset (Chin 1998); consequently, we followed Anderson and Gerbing (1988) and adopted a two-stage approach in the process of hypotheses testing. First, we employed confirmatory factor analysis (CFA) to assess the quality of the measurement model. Second, to test the conceptual model. In second section, to take advantage of the benefits offered from the use of structural equation modeling and to enable the modeling of both formative and reflective constructs in the empirical test of our conceptual framework, we adopted a PLS approach. PLS path modeling is well studied for its highly complex predictive models (Barclay et al. 1995; Chin 1998) and is qualified to handle constructs with mixed scales (Chin 1998).

Table 2 Correlation Matrix and Descriptive Statistics of Latent Variables

Variables	Idealism	Relativism	Corporate ethical value	Top manager support	Innovation of pollution prevent	Innovation of pollution control	Environmental perceived	Sales Revenues	Three-Year Sales Growth	Profit
Idealism	0.874									
Relativism	0.269***	0.845								
Corporate ethical value	0.134	-0.232***	0.908							
Top manager support	0.163**	-0.083	0.242***	0.898						
Innovation of pollution-prevent	0.185**	-0.034	0.102	0.616***	0.815					
Innovation of pollution-control	0.156	-0.124	0.111	0.606***	0.666***	0.897				
Environmental perceived	0.425***	0.018	0.115	0.437***	0.498***	0.438***	0.904			
Sales revenues	0.242***	0.048	0.088	0.264***	0.234***	0.104	0.219***	—		
Three-year sales growth	0.217***	0.014	0.046	0.259***	0.253***	0.159**	0.217***	0.939***	—	
Profit	0.262***	0.081	0.030	0.272***	0.299***	0.221***	0.229***	0.879***	0.909***	—
Market share	0.228***	0.028	0.012	0.243***	0.273***	0.192**	0.263***	0.895***	0.924***	0.888***

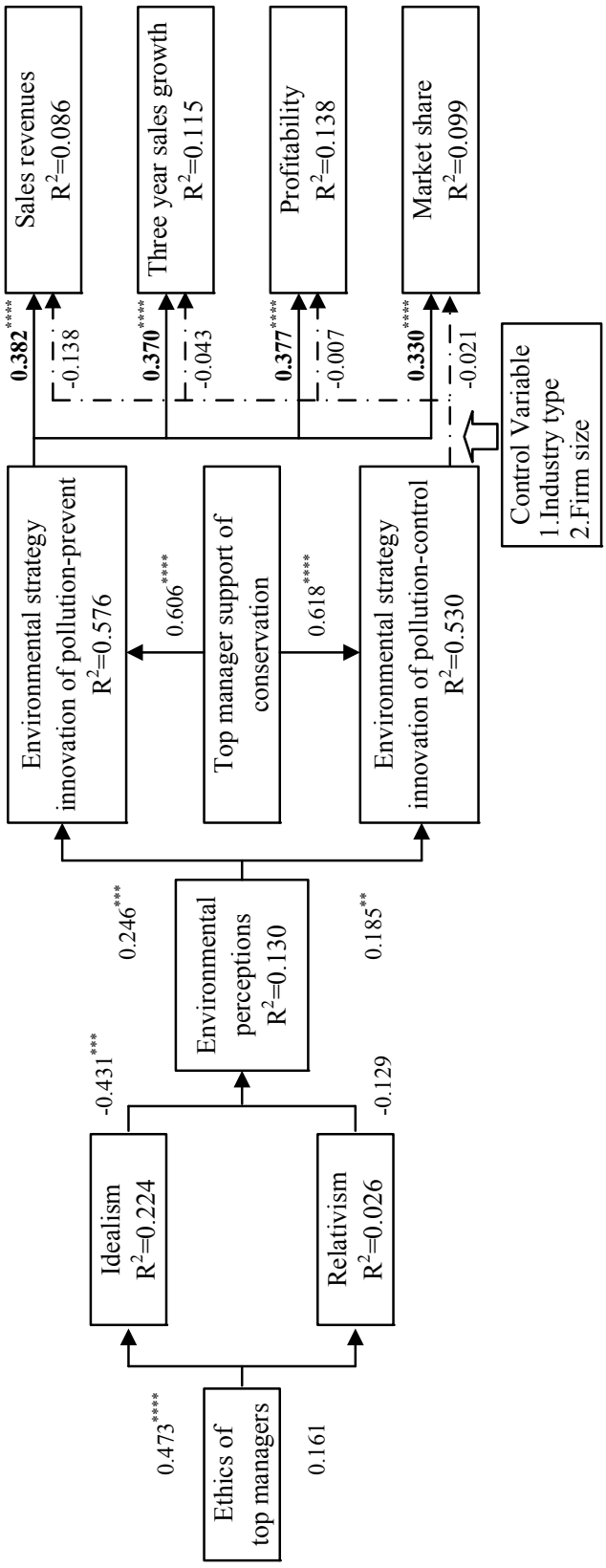
Notes: (1) ***p<0.01, **p<0.05, *p<0.1

(2) Diagonal elements are the square root of AVE. These values should exceed the interconstruct correlations for adequate discriminant validity. The condition is satisfied for each construct.

As opposed to covariance-based SEM (e.g., LISREL), usually used with an objective of model validation and requiring a large sample, PLS has many advantages, including the ability to robustly handle more descriptor variables, while providing more predictive accuracy and a much lower risk of chance correlation. Being a limited information approach (Dijkstra 1983), PLS path modeling is component-based and mainly used for score computation; it can be carried out on very small samples and therefore require less stringent assumptions in terms of multivariate normality, measurement levels of manifest variables and sample size (Chin 1998; Tenenhaus et al. 2005). Chin et al. (2003) found that PLS path modeling might be superior to moderated regression analysis and covariance-based methods for testing moderating hypotheses. Cassel et al. (1999) showed that PLS is quite robust with regard to several inadequacies (e.g., skewness or multicollinearity of the indicators, misspecification of the structural model) and that the latent variable scores always conform to the true values. Of course, PLS suffers from several handicaps: (1) The diffusion of path modeling software maintains more confidentiality than covariance-based SEM software, (2) the PLS algorithm is more a heuristic than an algorithm with well known properties, and (3) the possibility of imposing value or equality constraints on path coefficients is easily managed in covariance-based SEM but does not exist in PLS. The major limitations are a higher risk of overlooking real correlations and sensitivity to the relative scaling of the descriptor variables; however, these are more conservative approaches to model estimation.

4.1. Hypothesis testing

Figure 1 shows the results of the hypothesized structural model test, including the sign and significance of the path coefficients and the R^2 values, which indicate how well the variables explain an endogenous variable. Both the path coefficients and R^2 values were used to demonstrate the model's nomological validity. An examination of the R^2 values for the models of interest ranged from 0.115 to 0.576,



****p<0.001, ***p<0.01, **p<0.05, *p<0.1

Figure 1 Parameters of the structural equation model of the relationships among moral consciousness, environmental perceptions, conservation support from top manager, innovative environmental strategy, and financial performance.

except for relativism and the performance indexes of sales revenue and market share only, which were 0.026, 0.086 and 0.099, respectively. This indicates a satisfactory explanatory power for a model of CSR in comparison to other recent similar studies; for example, Jin and Drozdenko's (2010) study of social responsibility, ethics, and organizational performance had R^2 values ranging from 0.12 to 0.275 whereas Mishra and Suar's (2010) study in the Indian context had R^2 values ranging from 0.120 to 0.200.

The anticipated result regarding $H_{1(amended)}$ was that the ethic of top manager is positively related to idealism, but negatively related to relativism. The findings suggested that the ethic of top managers has a significant positive relationship with idealism and a positive but insignificant relationship with relativism. Next, given that H_2 was semi-supported, although both idealism and relativism indeed have a positive impact on environmental perceptions, only idealism was significant.

As to H_3, the structural modeling results indicated that the coefficients of the association with perception of importance of environmental issues and innovative environmental strategy are positive and significant. In particular, managers who perceive the importance of environmental issues are somewhat more inclined to adopt a proactive pollution-prevention strategy (coefficients of 0.246, $p < 0.01$) than a passive pollution-control strategy (coefficients of 0.185, $p < 0.05$). Eventually, top managers' support of conservation absolutely and efficaciously influences innovative environmental strategy (H_4), even if managers slightly prefer a passively pollution-control strategy.

In addition, upon further examination (H_{5a}-H_{5d}), it was found that the corporations may create excellent financial performance by adopting a proactive pollution-prevention strategy; in particular, high levels of proactive environmental commitment are associated with enhanced market share, this relationship being stronger in corporations showing high levels of sales revenues, growth and profitability.

5. Robustness checks

Some researchers have argued that PLS cannot solve global optimization problems for parameter estimation and that PLS does not consistently use a single criterion to minimize or maximize determination of model parameter estimation. Therefore, it can be difficult to evaluate PLS procedure and there is no guarantee that PLS will yield an optimum solution or provide a mechanism to evaluate overall goodness-of-fit of the model. To ascertain the robustness of our results, we applied a competing path modeling method called generalized structured component analysis (GSCA) proposed by Hwang and Takane (2004), to estimate the same model. GSCA strongly resembles PLS path modeling but avoids its major drawback of not having a global optimization function. GSCA recovered the parameters of the population model significantly better than SEM did. GSCA creates standardized composite variables as weighted sums of indicator variables, such that the average R-square value resulting from predefined linear relationships is maximized. GSCA consists of three defining elements: (a) a way to specify linear models, (b) an optimization criterion, and (c) an algorithm to obtain estimates.

We examined four values regarding both overall and local measures of model fit. The four measures are (1) FIT, indicating the proportion of total variance of the endogenous variables explained by the model; (2) AFIT, which is an adjustment of FIT for model complexity; (3) goodness of fit index (GFI); and (4) standardized root mean square residual (SRMR). The closer to 1.0 the better for the first three measures, and the closer to zero the better for SRMR. From the result (not reported in a table for the sake of brevity), we found that the overall samples' data-model fit was acceptable (FIT=0.681, AFIT=0.676, GFI=0.998, SRMR=0.078). Table 3 showed the comparison of models with PLS and GSCA, implying that there are no significant differences in construct, reliabilities, and R^2.

From the GSCA path modeling results shown in Table 4, the sign and significance of almost all coefficient estimates are qualitatively similar to the earlier analyses presented in Figure 1. Hence, we documented the robustness of our earlier conclusion based on PLS of a strong relationship among moral consciousness, environmental perceptions, conservation support from top manager, innovative environmental strategy, and financial performance.

Table 3 Comparison of Models with PLS vs. GSCA in Measurement Construct, Reliabilities and R-Square

Construct	PLS			GSCA		
	AVE	Cronbach α	R^2	AVE	Cronbach α	R^2
Ethics of top managers	0.825	0.973	—	0.825	0.973	—
Moral consciousness						
Idealism	0.764	0.962	0.224	0.764	0.962	0.223
Relativism	0.713	0.956	0.026	0.723	0.956	0.024
Top management support	0.807	0.920	—	0.805	0.920	—
Environmental perceived	0.818	0.968	0.130	0.818	0.968	0.138
Environmental strategy						
Innovation of pollution-prevent	0.664	0.943	0.576	0.663	0.943	0.589
Innovation of pollution-control	0.805	0.951	0.530	0.804	0.943	0.545

Notes: AVE donates Average Variance Extracted value.

Table 4 Path Coefficients of Empirical Model

Path Way			Estimate	SE	CR
Ethics of top managers	→	Idealism	0.472	0.087	5.46**
Ethics of top managers	→	Relativism	0.156	0.126	1.24
Idealism	→	Environmental perceived	0.456	0.144	3.17**
Relativism	→	Environmental perceived	-0.170	0.090	1.90
Environmental perceived	→	Innovation of pollution-prevent	0.204	0.100	2.03**
Environmental perceived	→	Innovation of pollution-control	0.177	0.083	2.14**
Top management support	→	Innovation of pollution-prevent	0.621	0.113	5.51**
Top management support	→	Innovation of pollution-control	0.633	0.087	7.26**
Innovation of pollution-prevent	→	Sales revenue	0.392	0.106	3.69**
Innovation of pollution-prevent	→	Three-year sales growth	0.379	0.110	3.44**
Innovation of pollution-prevent	→	Profitability	0.385	0.113	3.41*
Innovation of pollution-prevent	→	Market share	0.340	0.114	2.98**
Innovation of pollution-control	→	Sales revenue	-0.147	0.116	1.27
Innovation of pollution-control	→	Three-year sales growth	-0.052	0.109	0.47
Innovation of pollution control	→	Profitability	-0.015	0.110	0.14
Innovation of pollution-control	→	Market share	-0.031	0.122	0.25

Notes: (1) $^{**}p < 0.05$, $^{*}p < 0.1$.
(2) CR donates the absolute bootstrap Critical Ratio.

6. Discussions

As anticipated, the results indicated that idealism involves a genuine concern for others and optimistically assumes that desirable outcomes can be obtained by engaging in moral actions (Henle et al. 2005). Environmental issues ranged from passive to proactive , as exemplified by an end-of-pipe approach to dealing with wastewater, exhaust, solid waste and toxic chemical substance; using recyclable, reusable, or non-hazardous materials and processes; and participating in green initiatives and minimizing waste. Consistent with the findings of Singhapakdi et al. (1999) and Vitell et al. (2010), the ethic of top managers seems to influence subordinates' moral improvement as it positively impacts their moral philosophy. It provides practitioners with direction so that managers with a high-level perception of the importance of environmental issues will practice environmental responsibility and be more likely to adopt proactive innovative pollution-prevention policies. From this perspective, a corporation should provide in-house training in ethics to help employees make appropriate ethical decisions. Otherwise, a corporation should engage periodically in conservation and endorsement activities to advocate the importance of the natural environment and to address the environmental concerns of stakeholders. Nevertheless, blindly cultivating top managers' ethical value without adequate integration of subordinates' moral philosophy will not improve the ethical climate of organizations because managers' individual moral philosophies may make them more or less willing to adhere to organizational policies. Therefore, not only should top managers be made aware of ethical values through codes of ethics, but subordinates' ethical ideologies should also be recognized when formulating codes of ethics to avoid the misinterpretation and misapplication of organizational values and intentions.

Top managers' support of conservation absolutely and efficaciously influences innovative environmental strategy, which implies that top managers and leaders aspire to achieve the shared value of seeking the corporations as sustainable development, thereby creating or maintaining socially responsible values throughout the enterprise. As previously discussed, the belief and behavior of top managers may shape subordinates' values and be adopted by subordinates; hence, top managers should address and communicate the importance of environmental issues.

In addition, the financial performance examination results suggested that corporations incorporating proactive environmental innovation into operation in Taiwan accelerate sustainable development and promote competitive advantages,

especially in sales revenue, growth and profitability (Ambec and Lanoie 2008). Proactive environmental management allows firms to generate social consensus and accumulate trust and reputation. Furthermore, it can also open new markets, especially because of the growing interest in green provision, and induce lower liability costs, avoiding potentially costly litigation and fines (Schaltegger and Wagner 2006).

In other words, managers at all levels play an important role in promoting environmental practices by developing policies that intelligibly outline the firm's desire to engage in CSR (Carter and Jennings 2004; McGuire et al. 2003). Finally, the incentives that would encourage practitioners to pursue environmentally oriented initiatives at their industries were identified; therefore, it is valuable for the regulatory authorities to establish rigorous and persuasive legislation to reward voluntary protection of the natural environment.

In addition, several calls have been made in the literature, for contributions covering the mechanisms connecting financial performance s before and after CSR (Orlitzky et al. 2003; Cavaco and Crifo 2010). Meta-analysis from Margolis et al. (2007) also confirm the positive relationship, as well as the existence of a virtuous circle: good financial performance leads to a good level of CSR, which in turn contributes to improving the firm's financial performance. Hence, this study also examined the plausible model, adverse-direction, of the economic performance-environmental strategy. We found that corporations will negatively conduct a pollution control strategy (coefficients of -0.817, $p < 0.01$) when they have good performance in sales revenue. In addition, corporations are devoted not only to passive pollution control (coefficients of 0.339, $p < 0.05$) but also to pollution prevention (coefficients of 0.378, $p < 0.05$) when they have good performance in profit. However, the effect of good performance in profit on pollution control is stronger than it is on pollution prevention. The other criteria of economic performance have no significant effect on environmental strategy.

7. Conclusion

This paper analyzes the relationship among moral consciousness, environmental perceptions, conservation support from top management, innovative environmental strategy, and financial performance. The analysis shows the positive effect of the ethics of top managers on environmental professionals and the effect of environmental strategy on financial performance. Compared to a relativist, the results also show that the idealist is more likely to be aware of the importance of the

environment and to efficaciously promote environmental strategy and economic performance. This study is particularly relevant for organizations because it investigates the application of idealism and relativism among environmental professionals regarding environmental strategy and economic performance, elucidating implications for practitioners.

This study makes several contributions to the CSR and environmental management literature by conceptualizing and testing an integrated model of innovative environmental strategy and economic performance, particularly in the Taiwanese context. It offers a methodological contribution to empirical studies on moral consciousness, environmental perceptions, and top management support in environmental protection. Furthermore, it indicates to practitioners that top managers' ethic and support of conservation result in effective environmental innovation–even in enhanced financial performance. For policy makers, managers acting as a multiplier effect for social responsibility can transfer CSR initiatives beyond the individual to improve the social responsibility of business practices (Preuss 2000).

Despite these contributions, as with any empirical study, several potential limitations exist in this study. This research has focused on the design of structural mechanisms motivated by the framework in Taiwan; therefore, the results may not be generalizable outside Taiwan. Furthermore, the low response rate, due to participants' refusal to participate in the study on personal ethical orientations, undermines the predictive validity and generalizability of the findings. Still, due to the sensitivity of ethical issues, self-appraisal cannot reflect the function of environmental strategy; further research can match the reliable quantitative data in financial performance and qualitative issues to re-verify the results. In addition, selection bias limiting generalizability may have occurred because responders to ethical studies of this nature would be keen to behave ethically, in contrast to non-responders; however, this warrants further investigation. Rather, as we only explored the relationship among moral consciousness, environmental strategy, and top management support in conservations, the prevailing organizational orientation such as entrepreneurial or market orientation (Ben et al. 2011), and agency problems, such as self-interest and incentive (Jensen 2002), will likely interact with the organizational culture/agency problem in determining the extent of the environmental strategy adopted. Future research focusing on the interplay between cultural orientation/agency problem for environmental policy can provide guidance for practitioners in implementing the most predominant course of action. Despite its

importance, environmental stewardship is not always the top priority for industry in Taiwan; future research also can simultaneously investigate socially responsible initiatives like gender and racial diversity in the workplace to see how and whether environmental or social considerations have the most significant impact on financial performance.

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