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Challenges of the "green imperative": a natural resource-based approach to the environmental orientation–business performance relationship

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Abstract

Drawing on the natural-resource-based view (NRBV) of the firm, the authors test a model of the impact of the higher order construct of natural environmental orientation (NEO) on firm performance. Based on the literature in this area, the authors define NEO as comprising three components: entrepreneurship, corporate social responsibility (CSR), and commitment to the natural environment. The study uses data from 140 Australian manufacturing firms. The findings reveal that the higher order construct of NEO is positively and significantly related to profit after tax and market share; however, it is negatively related to sales growth. The study's practical and academic implications are discussed, along with limitations and future research directions.

Keywords: Natural environmental orientation; Corporate social responsibility; Entrepreneurship; Environmental commitment; Resource-based view

1. Introduction

> Without the co-operation of industry, the world will not grow cleaner. . .For far-sighted companies, the environment may turn out to be the biggest opportunity for enterprise and invention the industrial world has seen (Cairncross, 1990).

A myriad of environmental problems face the international business community as it looks into this new century, from the effects of overpopulation and increasing industrialization to the loss of threatened habitats and species. In particular, stakeholder groups, concerned about these critical issues and the extent to which the business community has ignored or exacerbated them, are demanding that the business community take action (Klassen and Whybark, 1999). Many writers suggest that current business practice will prove inadequate in addressing these problems (Cairncross, 1992; Hart, 1995; Schmidheiny, 1992; Smart, 1992). Thus, not only must the business community face the challenges of this green imperative but they must also capture the resources and develop the skills and capabilities to remain competitive in this new, dynamic, green environment.

As practitioners have begun to address the challenges posed by the natural environment, so too has the academic community. For instance, previous scholars have proposed a variety of concepts to capture this phenomenon, such as green orientation (Cravens et al., 1987), enviropreneurial marketing (Varadarajan, 1992; Menon and Menon, 1997), ecomarketing orientation (Miles and Munilla, 1993), and corporate environmentalism/environmental orientation (Banerjee, 2002; Miles and Covin, 2000). Nevertheless, only recently have studies developed constructs and measures for corporate environmentalism (Banerjee, 2002). However, the scales developed to measure corporate environmentalism have remained limited in their operational capacity. Although researchers have noted this limitation, no one has systematically addressed it. In addition, the definitions have remained theoretically too broad and, as such, there is a limit to their usefulness to managers. Therefore, we argue that the literature in this area lacks strong theoretical grounding.

The purpose of this study is to propose a higher order construct of natural environmental orientation (NEO). We propose that this higher order construct is composed of three first-order dimensions, namely entrepreneurship, corporate

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social responsibility (CSR), and commitment to the natural environment. Drawing on, and extending, the natural resource-based theory, we argue that these three capabilities are rare, valuable, and difficult to imitate. Thus, successful implementation should lead to a competitive advantage (cf. Hart, 1995). This article hypothesizes and tests the relationship between NEO and firm performance. In so doing, this study is the first, to the best of our knowledge, to test the assumptions proposed by Hart (1995).

2. Theoretical background and hypotheses

2.1. An overview of the natural-resource-based view

In proposing our model, we adopt the natural-resource-based view (NRBV) of the firm as our theoretical foundation (Hart, 1995), which is itself an adaptation of the resource-based view of the firm (RBV). The RBV suggests that it is a firm's bundle of resources rather than a product deployment of those resources that determines a firm's competitive position (Wernerfelt, 1984). Barney (1991) expands the definition of RBV, arguing that organizational resources that are valuable, rare, difficult to imitate, and nonsubstitutable can yield sustained competitive advantage. Such a resource will be either tacit (causally ambiguous) or socially complex. Tacit resources are skill-based and people-intensive (Hart, 1995; Russo and Fouts, 1997). They are developed through a firm's employees learning skills and gaining experience through the repeated practice of tasks. Socially complex resources are developed where a large number of people, or teams, are engaged in a coordinated action of such complexity that few individuals, if any, have sufficient breadth of knowledge to grasp the overall phenomenon (Barney, 1991).

Hart (1995) expands the definition of RBV, recognizing that firms that are overcommitted to a specific bundle of resources may find it difficult to acquire new resources or capabilities. Firms must be able to respond to changing environmental imperatives through the development of new resources. Hart argues that "one of the most important drivers of new resources and capability development for firms will be the constraints and challenges posed by the natural (biophysical) environment" (p. 989). Thus, the NRBV of the firm is an adaptation of the RBV of the firm, made necessary because of the demands imposed by the natural environment.

2.2. The green imperative

Although Malthus' prediction that the growth in the world's population would have catastrophic consequences has not come to pass, concern exists that rapid population growth will have substantial negative environmental and social consequences (Malthus, 1966). A United Nations study estimates that a global population of between 8 and 12 billion people could have catastrophic consequences, such as uncontrolled spread of disease, deforestation and soil erosion, water depletion, and air pollution (Kaplan, 1994). This will certainly create new challenges for business, if they are to meet future consumer demands.

The complex and interrelated nature of environmental problems will challenge the business world to move beyond mere compliance with environmental regulations to develop innovative responses to environmental challenges (Hart, 1995). Corporate attention will have to focus on responses such as reducing waste and emissions, reducing and recycling solid waste, conserving energy and other natural resources, and reducing business impact on ecosystems. In addition, firms are likely to have to develop resources internally to compensate for the lack of available natural resources. As suggested by Hart (1995, p. 991), "over the next decade business will be challenged to create new concepts of strategy, and its seems likely that the basis for gaining competitive advantage in the coming years will be rooted increasingly in a set of emerging capabilities such as waste minimization, green product design, and technology cooperation in the developing world." In the future, it is those firms that are able to secure the resources and develop the competencies to address the challenges of natural environmental constraints that will thrive (Cairncross, 1992; Schmidheiny, 1992; Smart, 1992).

2.3. Natural environmental orientation and its components

Although the literature sheds some light on the philosophy of corporate environmentalism, it is unclear as to which specific activities help to translate the philosophy into practice, engendering a corporate NEO. This study extends previous studies (e.g., Banerjee, 2002) by proposing a higher order construct of NEO that is composed of three core themes, or first-order factors: (1) entrepreneurship, (2) CSR, and (3) commitment to the natural environment.

We have identified these three core resources (e.g., entrepreneurship, CSR, and environmental commitment) as resources that will give rise to a NEO rather than define the process of NEO. Descriptively, our definition is a starting point for examining the components of a NEO. Normatively, it is also a starting point for prescribing an optimal definition of a NEO, one that has the greatest capacity to transform an organization into a natural environmentally oriented organization. We drew on and extended Hart's (1995) conceptual framework of NRBV in the selection of the three components of NEO. Nevertheless, NEO has some similarities to and differences from the NRBV framework, which will be discussed here.

Hart's conceptual framework covers three underlying dimensions, namely, pollution prevention, product stewardship, and sustainable development. Hart (1995, p. 996) proposes that "reducing emissions is the fundamental aim of pollution prevention." A pollution prevention strategy aims to minimize emissions, effluents, and wastes. The key resource is continuous improvement methods (or TQM

principles) that focus on well-defined environmental objectives rather than relying on expensive "end-of-pipe" capital investments to control emissions. Following Hart, our construct of CSR involves a proactive approach to the management of the business/natural environment interface (Aragon-Correa and Sharma, 2003). The focus is on preventing environmental hazards instead of controlling them at the end-of-pipe or smokestack. Drawing on Carroll (1979), Wartick and Cochran (1985) characterized corporate strategy toward social responsiveness in four categories: reactive, defensive, accommodative, and proactive (Wartick and Cochran, 1985). Later, Clarkson (1988, 1991) developed the Reactive, Defensive, Accommodative, and Proactive (RDAP) scale to describe such categories more explicitly. The RDAP scale suggests that proactive companies, unlike their reactive and accommodative counterparts, anticipate responsibility of their actions by doing more than is required.

Similar to Hart's (1995) concept of pollution prevention, CSR focuses on prevention through continuous improvement. This is achieved through higher order learning within the organization and generating competitively valuable resources and capabilities, tacit knowledge, and skills (Sharma and Vredenburg, 1998). Finally, the scale we use to measure CSR, derived from the CERES Principles, has been used by previous researchers to measure a pollution prevention strategy (Sharma, 2000; Sharma and Vredenburg, 1998).

Hart (1995) notes that product stewardship enables firms to (1) select raw materials with minimum environmental hazard, (2) direct product design to minimize the environmental impact of the product system, (3) minimize the life-cycle costs of their products systems by exiting environmentally hazardous businesses, (4) redesign existing product systems to reduce liability, and (5) develop new products with lower life-cycle costs. He also argues that product stewardship can help differentiate the firm's products by establishing the firm as an early mover in green product domains. This, in turn, enhances the firm's competitive advantage (i.e., competitive preemption) (Hart, 1995). Our multidimensional construct of entrepreneurship captures three dimensions, namely, innovativeness, risk taking, and proactiveness. Hence, the innovativeness dimension captures the product stewardship aspect of Hart's NRBV framework. We also extend his framework by considering two additional dimensions of entrepreneurship in green markets (i.e., risk taking and proactiveness). Consequently, if product stewardship is a means to end, as Hart explains, then one should also take into account risk-taking and proactiveness in relation to competitive preemption.

A firm's commitment to sustainable development is fostered by a strong sense of externally driven, legitimacy-based activities (Hart, 1995). Hart (1995) also mentions that the internally driven pollution prevention strategy is limited in that it does not include the social environment purpose. Thus, we have included a construct (environmental commitment) that attempts to bridge these two dimensions by integrating both the externally and internally driven perspectives. For instance, external and internal reporting, environmental audits and reviews, internal environmental reward systems, and employee training are included in the measure of environmental commitment. Consequently, the environmental commitment construct refers to some aspects of TQM principles and those that legitimize the organization to external stakeholders. We now detail the theoretical and empirical rationale behind choosing these three constructs as first-order factors of a higher order construct of NEO.

2.3.1. Entrepreneurship

Entrepreneurship can be defined in two ways: as a social process or as the totality of a firm's actions (Ireland et al., 2001). Entrepreneurship, as defined by Ireland et al. (2001), is a context-dependent social process through which individuals create value by bringing together a unique package of resources to exploit an opportunity in the marketplace. Two key entrepreneurial skills are the ability to gain access to a variety of resources and knowing how to leverage them creatively (Ireland et al., 2001). However, entrepreneurship is also used to describe the propensity of a company to take calculated risks, to be innovative, and to demonstrate proactiveness (Covin and Slevin, 1991). In other words, entrepreneurship is a set of actions that may enable a firm to address natural environmental issues. We believe that a corporate-wide definition of entrepreneurship in a natural environmental context requires both approaches to be taken into consideration equally.

An entrepreneurial approach allows firms the flexibility to address the unique nature of natural environmental opportunities and the challenges posed by unique green markets. This may involve organizations being able to respond to ill-defined customer preferences, to address imperfect government regulations, and to cope with uncertain market dynamics (Coddington, 1993). Proactiveness will provide the company with the necessary impetus to identify environmental market opportunities and to initiate preemptive actions (cf. Covin and Slevin, 1991). A propensity to innovate enables firms to find new ways to produce, package, manufacture, and market goods and services to environmentally concerned customers and to address evolving environmental problems (Coddington, 1993).

An entrepreneurial approach provides an organization with the necessary resources to respond to these characteristics and, in turn, provides a sustainable competitive advantage. As previously discussed, for a resource to contribute to a sustained competitive advantage, it must possess certain properties. We argue that an entrepreneurial approach is a rare, or firm-specific, resource. What constitutes an entrepreneurial approach are tacit skills and knowledge that are disseminated throughout a firm. They form a valuable intangible resource that is difficult for others to imitate (Barney, 1991), as not all firms have the skills, resources, and willingness to accept the risk presented by the environmental opportunity.

It should be acknowledged that responding to the challenges of the natural environment through proactive business management practices is not without some level of risk. As is the case with all business endeavors, there can be both benefits (Rondinelli and Berry, 2000) and costs (Wilmshurst and Frost, 2000). For instance, a forest products firm that chooses to reduce waste by using it to generate energy may have a negative impact on its manufacturing process (a low risk situation). This same firm may choose to introduce environmentally certified forest products to the marketplace and assume a much higher risk because of the possibility of poor consumer acceptance. The general desire to avoid or pursue risk (i.e., risk preference) will affect the likelihood of top management behaving in more or less risky ways (i.e., risk propensity). In turn, the specific risk behaviors of top managers that emerge as a result of this risk propensity will form and shape the firm's responsiveness to these different risk scenarios (Lumpkin and Dess, 1996).

The final reason entrepreneurship has been selected as a component of NEO is because entrepreneurship has long been considered a building block of corporate environmentalism and ecocentric management (Menon and Menon, 1997; Miles and Munilla, 1993; Shrivastava, 1995). For example, Shrivastava (1995) proposes that because ecocentric companies should accommodate an adhocracy culture (cf. Cameron and Quinn, 1999), entrepreneurship as an indicator of adhocracy is likely to facilitate organization's ability to successfully exploit green market opportunities. In addition, Aragon-Correa (1998) found that firms with a high level of entrepreneurial activity will have more advanced approaches to the natural environment.

2.3.2. Corporate social responsibility

Carroll (1979) has identified CSR as being one of the three critical dimensions of the broader concept of corporate social performance. Carroll suggests that organizations need to determine whether they have responsibility for their economic performance alone, or for other concerns as well. If they are to accept responsibility for other concerns, they need to decide what are the relevant issues of concern (e.g., natural environment, poverty, overconsumption, etc.), and how they should address them (e.g., proactiveness vs. reactiveness).

We define CSR as those business activities that take into account the public consequences of organizational actions, beyond simple compliance with government regulations (e.g., Sharma, 2000). Thus, our definition suggests that business should go beyond economic concerns, enumerates the natural environment as a particular issue of relevance, and argues that a proactive stance is necessary (e.g., Clarkson, 1988, 1991). Our definition is consistent with the work of Frederick (1986, 1994, 1998). Frederick expanded the CSR paradigm by arguing that the natural environment should be a critical business concern, and therefore it should be included in the context of CSR. Our definition requires an organization to adopt voluntary strategic practices such as safeguarding natural habitats, eliminating physical wastes from the operations, conserving nonrenewable natural resources (e.g., oil, natural gas), informing external customers of the environmental impacts of products, and correcting conditions that may endanger the natural environment (Sharma, 2000).

Some of those regulatory and voluntary actions will require the implementation of new technologies. This may involve higher order learning for employees leading to the development of competitively valuable organization resources and capabilities (Sharma, 2000). In turn, this organizational learning will create tacit knowledge and skills, both at the individual and group level, that will be difficult for others to observe and imitate (Berman et al., 2002). Thus, the adoption of CSR should provide a firm with the opportunity for sustained competitive advantage through the accumulation of a rare and firm-specific resource—socially complex, tacit, knowledge development.

2.3.3. Environmental commitment

Environmental commitment can be defined as an organization-wide recognition of the importance of the natural environment that influences organizations to act in ways consistent with the interests of the natural environment (Henriques and Sadorsky, 1999). Organizations that are environmentally committed practice many of the following type of activities: having a written environmental plan, communicating its environmental plan to shareholders or stakeholders, communicating this plan to employees, rewarding environmental performance, and conducting regular environmental audits (e.g., Henriques and Sadorsky, 1999; Hunt and Auster, 1990; Roome, 1992). Environmental commitment also requires organizations to take a long-term perspective to utilize policies and strategies that support this long-term view and to allocate the necessary resources accordingly.

Henriques and Sadorsky (1999) suggest that what a company is actually doing, or has done, in relation to environmental issues can describe its commitment to the natural environment. Previous researchers suggest that environmentally proactive companies have top management support that is involved in environmental issues, utilize internal and external environmental reporting, and employee environmental training and involvement is encouraged (e.g., Carroll, 1979; Clarkson, 1988, 1991; Hunt and Auster, 1990; Wartick and Cochran, 1985). As Hart (1995) explains, it is difficult for most firms to generate such a consensus of purpose and action, and, thus, the shared vision and practices are rare and firm-specific resources that few companies have been able to establish or maintain. It is a socially complex phenomenon dependent on strong moral leadership and the commitment of many individuals within the firm. In conclusion, the NEO (i.e., strategic intent) of an organization will be based on the unique knowledge potential, skills, and resources that will be given by entrepreneurship, CSR, and environmental

commitment. Although each of these three dimensions is extremely important to firms, individually they are not enough to engender a NEO. Specifically:

Hypothesis 1: NEO is a higher order construct composed of three dimensions: (a) entrepreneurship, (b) CSR, and (c) environmental commitment.

Drawing on the NRBV, we suggest a NEO is embedded in the skills, resources, and capabilities that will be fostered by entrepreneurship, CSR, and commitment to the natural environment. These resources are both valuable and non-substitutable because they are based on tacit knowledge and skills, dependent on groups of people, or they are specific to a particular firm (Barney, 1991). The NRBV also suggests that the NEO will positively affect a firm's competitive advantage (i.e., cost or market differentiation, preemptive moves, positional advantage) (Hart, 1995). A firm's performance will reflect the multiple competitive advantages that will be provided by the combination of these strategic resources (Klassen and Whybark, 1999).

Previous studies argue that social performance, which is highly correlated with good management practice, leads to better firm performance (e.g., Waddock and Graves, 1997). They reason that performing well in social arenas is good managerial practice. On the one hand, by meeting stakeholders' expectations proactively and aligning them more closely to NEO, the firm may experience increased levels of performance (i.e., strategic intent) (Clarkson, 1988, 1991). On the other hand, the adoption of a NEO may be led by fears of losing external reputation when the firm's social performance seeks simply to avoid bad publicity. Waddock and Graves (1997) further explain that although this social performance is not supported by a genuine commitment by managers, at the least it requires a minimum level of investment that may lead to better performance. The adoption of a NEO will result in improved attention to the interests of key external and internal stakeholders, as a precursor to good quality management practice. In turn, this level of practice may provide benefits beyond their costs that are eventually reflected in performance, represented in this study by sales growth, profit after tax, and market share.

These performance measures were selected because they capture both firm market performance (market share) and financial performance (sales growth and profit after tax). Previous studies have only used financial performance measures with inconsistent results. Thus, there is a need for more empirical evidence on the relationship between NEO and financial performance. In addition, studies on corporate environmentalism appear to have ignored market performance implications of adopting environmental strategies. Consequently, NEO is simply a way of doing business that is expected to lead to positive influence on firm performance. Therefore, we hypothesize that:

Hypothesis 2: NEO will be related positively to an organization's sales growth.

Hypothesis 3: NEO will be related positively to an organization's profit after tax.

Hypothesis 4: NEO will be related positively to an organization's market share.

3. Method

3.1. Measure development

We developed our survey instrument based on the feedback received from 15 randomly selected CEOs/senior executives and four academics. It should be noted that the questionnaire asked respondents to recall their firm's environmental processes and efforts in general. In doing so, we aimed to maximize the potential variance and avoid perceptual biases (see Appendix A).

Entrepreneurship was measured with a 9-item, 5-point scale (1 = *does not describe this organization*, 5 = *definitely describes this organization*) adapted from Covin and Slevin (1989) for the specific context of this study. For *CSR*, we utilized the CERES Principles to develop a 10-item, 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*) specifically for this study. The CERES Principles (formerly known as the Valdez Principles) are a set of 10 environmental management principles. They were developed in 1989 by a coalition of pension funds, environmental groups, and religious organizations (Coddington, 1993). *Commitment to the natural environment* was measured with a 9-item, 5-point scale (1 = *very rare*, 5 = *very common*) that was developed for this study, based on previous studies in natural environmental management (e.g., Dechant and Altman, 1994; Henriques and Sadorsky, 1999; Hunt and Auster, 1990; Roome, 1992). Finally, *firm performance* was measured by means of market performance (i.e., market share in dollar terms) and financial performance (i.e., sales growth over the last 2 years and profit after tax). All three measures of performance were obtained from the *Business Review Weekly*'s (2000) annual release of the 1000 largest Australian enterprises. We used log-transformation of the relevant indicators in the data analysis. We matched the participating companies with their performance indicators. Using these objective performance measures also enabled us to reduce the potential common method bias.

3.2. Sample and data collection

A list of major manufacturing firms (485 firms), purchased from a leading market research/databank company in Australia, was used for data collection. The first mailing packet contained a personalized letter, a questionnaire, and a postage-paid envelope with an individually typed return-address label. In addition, we offered respondents a copy of the finished report, summarizing the research findings, to increase the response rate. Four weeks after the first

mailing, we sent a follow-up letter and an additional copy of the questionnaire to nonrespondents. We obtained 140 usable questionnaires from the Australian manufacturing firms, a response rate of 29%. The questionnaires were completed by managers who were the CEO or held an equal position.

The firms represented a large variety of sectors: chemicals, petroleum, and plastics (19%); food, beverage, and tobacco (18%); basic metals (16%); machinery (14%); and textiles, apparel, and leather (13%). On average, most firms were large in terms of the number of employees (88%). Seventy-five percent of firms had an environmental market share of 1–9%. Fifty-four percent of firms had total annual sales of more than AUS$100 million. Forty-two percent of firms had an annual profit of AUS$10–23 million.

We tested for likely nonresponse bias by splitting the total sample into two groups; those received before the second wave of mailing and those received after the second wave (i.e., nonrespondents) (Armstrong and Overton, 1977). We compared these groups in terms of the mean responses on each variable, using a t test. The results revealed no significant differences between the two groups, leading us to conclude that respondents were not different from nonrespondents.

4. Analysis and results

Because of the relatively small sample size, we assessed unidimensionality, reliability, and the validity of the constructs individually through three CFA models with LISREL 8.30 (Jöreskog and Sörbom, 1996). We employed a series of previously suggested procedures to check for the convergent validity and discriminant validity. For example, the convergent validity of the scales is supported if all the estimated coefficients of all the indicators are significant (Bagozzi and Yi, 1988; Gerbing and Anderson, 1988). Likewise, discriminant validity is supported if no confidence intervals of the correlations for the constructs (ϕ values) includes 1.0 ($P<.05$) (Anderson and Gerbing, 1988) and the square of the intercorrelation between two constructs, ϕ^2, is less than the average variance extracted (AVE) estimates of the two constructs for all pairs of constructs (Fornell and Larcker, 1981).

The initial CFAs did not provide an acceptable fit. Given the exploratory nature of this research and because these scales have not been tested in the Australian setting, we followed the procedure suggested by Anderson and Gerbing (1988). Based on factor loading (λ), residual covariation, and modification index, we deleted three items from each scale. The remaining items resulted in a single-factor model with an excellent fit. All factor loadings were statistically significant. The reliability estimates were above the threshold (Bagozzi and Yi, 1988). In addition, except for the scale of CSR, the AVE estimates were above .50. Overall, the scales had internal validity and reliability (Appendix A). Of particular concern, however, was the discriminant validity between the constructs of CSR and environmental commitment. Hence, we first employed a chi-square difference test to examine whether they were distinct from each other. We combined the two constructs into a single model and compare the fit with that of a two-construct model (Anderson and Gerbing, 1988). We found that a two factor model had a better fit than a single factor model [$\Delta\chi^2(1)=47.8$, $P<.001$]. Second, we used Fornell and Larcker's (1981) stringent test of discriminant validity. We found that the square of the intercorrelation between two constructs was less than the AVE estimates of the two constructs (Fornell and Larcker, 1981), meaning that these two constructs were distinct. Table 1 displays the intercorrelations among constructs and their descriptive statistics.

We tested our hypotheses using a higher order path analysis in LISREL 8.30 due to 56 parameters to be estimated that require a sample size of 280 and more, otherwise. Therefore, we combined the items of each construct into a single indicator. The measurement path estimates were set to the square root of a scale's reliability and the error variance was set equal to 1 minus scale reliability (Loehlin, 1987). In addition, no error variances for single-item performance measures were assumed (Bollen, 1989). We employed individual hierarchical models for each performance measure to better examine the model relationships (Hult and Ketchen, 2001).

Table 2 shows that the overall fit of the hypothesized path model was good for all three performance variables. We found that entrepreneurship, CSR, and commitment to natural environment loaded significantly on the higher order construct of NEO and explained a significant portion of the variance in the higher order construct of NEO. These findings supported Hypotheses 1a–c.

Hypothesis 2 posits that higher order construct of NEO will be related positively to sales growth. NEO was found to be negatively and significantly related to sales growth. This finding was not in the direction we hypothesized. We will discuss the possible reasons for this unexpected finding in more detail later. NEO was found to be positively and

Table 1
Descriptive statistics and intercorrelations

	1	2	3	4	5	6
1. Entrepreneurship	–					
2. Corporate Social responsibility	.20	–				
3. Environmental commitment	.35	.57	–			
4. Sales growth (%)	−.09	−.09	−.21	–		
5. Market share (log)	.16	.35	.18	.08	–	
6. Profit after tax (log)	.04	.05	.21	−.14	−.21	–
Mean	3.47	3.82	3.45	0.03	1.74	2.27
Standard deviation	0.83	0.61	1.01	0.17	1.18	1.66

Correlations above .14 significant at $P<.05$.

Table 2
Results of structural equation modeling

Dependent variable	Path	Loading	t	R^2	Fit indices
Sales growth	Entrepreneurship to NEO	.93	14.55***	.87	$\chi^2(2)=2.96$, $P=.227$, GFI=.99, CFI=.99, RMSEA=.06
	CSR to NEO	.90	13.45***	.81	
	Commitment to NEO	.96	15.47***	.92	
	NEO to sales growth	−.17	−2.76*	.09	
Market share	Entrepreneurship to NEO	.93	14.53***	.87	$\chi^2(2)=7.43$, $P=.191$, GFI=.98, CFI=.99, RMSEA=.10
	CSR to NEO	.90	13.44***	.81	
	Commitment to NEO	.96	15.44***	.92	
	NEO to market share	.13	2.03*	.06	
Profit after tax	Entrepreneurship to NEO	.93	14.52***	.87	$\chi^2(2)=5.48$, $P=.065$, GFI=.95, CFI=.95, RMSEA=.11
	CSR to NEO	.90	13.43***	.81	
	Commitment to NEO	.96	15.48***	.92	
	NEO to profit after tax	.20	3.20*	.12	

* $P<.05$.
*** $P<.001$.

significantly related to profitability and market share, supporting Hypotheses 3 and 4.

5. Discussion and implications

The purpose of this study was to shed light on the relationship between NEO and selected performance measures. We found that the higher order construct of NEO, composed of entrepreneurship, CSR, and commitment to the natural environment, is positively and significantly related to a firm's profit and market share. Our results support the argument that sound environmental practices can be profitable, helping to set course for higher overall business performance (Klassen and McLaughlin, 1996; Shrivastava, 1995). In addition, our results support previous research in this area that have found a positive relationship between environmental performance and financial performance (McGuire et al., 1988; Russo and Fouts, 1997).

Although we found a negative relationship between NEO and sales growth, this finding is not unexpected given the mixed findings in the literature. For instance, Jaggi and Freedman (1992) found a negative relationship between environmental performance and financial performance in the short run. One explanation for the negative relationship is that we only capture sales figures over the last 2 years. This incremental measure, unlike profitability and market share, requires a longer measurement period. In addition, we were unable to capture the exact timing of the adoption of NEO, therefore, our results are a snapshot in time only. Some of the respondent companies may have started their focus on environmental activities only very recently. Thus, the reputational advantage (Miles and Covin, 2000) created by environmental activities may yet be reflected in the sales growth. Finally, Hunt and Auster (1990) suggest that firms often overlook environmental management schemes because the short-run effect on the bottom line may be negative.

As previously mentioned, this study is the first to explicitly test Hart's (1995) theory of a competitive advantage based upon the firm's relationship to the natural environment. Our results support the NRBV of the firm that valuable resources can have a positive impact on performance outcomes. Thus, we argue that firms should respond to the changing environmental imperatives through the development and deployment of valuable and nonsubstitutable resources. Firms that develop the resources both to address the constraints imposed by the natural environment, and to capture the opportunities offered by it, are likely to yield to higher performance.

We found that commitment to the natural environment explained more variance in the higher order construct of NEO than the other two components. Firms that communicate the importance of the natural environment are likely to contribute to the recognition of NEO throughout the organization and in turn increase the firm's profitability and market share. However, the communication of these values is not sufficient on its own. Firms must also develop programs to support these values, such as committees to develop formal plans to address environmental issues, manuals detailing environmental procedures, employee training programs, and supplying environmental information in external communications.

The next most important component in the higher order construct of NEO is entrepreneurship. Firms that have a strong inclination to pursue high-risk environmental opportunities and that emphasize a bold innovative approach to developing environmentally friendly products are likely to prosper. In addition, those that have a high rate of environmentally friendly product introductions and are the first to introduce such products and technologies into the market are likely to thrive.

Finally, CSR was the next most important component in the higher order construct of NEO. Those firms who attempt to reduce physical waste, or dispose of physical waste through environmentally safe methods, may reduce costs and positively affect their profitability. Effective communication of the environmental impact of the products is likely to positively affect a firm's performance through its reputational advantage (Miles and Covin, 2000). The adoption of processes that are reliant on the sustainable use of renewable

natural resources result in both lower cost and increased reputation.

Overall, we believe that we have captured all of the essential components of the higher order construct of NEO. The relatively small variance explained (ranging from 6% to 12%) in the three performance measures may suggest however that there are some other components that should be included in a complete definition of NEO. Future studies that explore the relative contribution of NEO on performance should include other strategic orientations. This will provide researchers and managers with a more complete understanding of the relative contribution of NEO beyond the ''mainstream'' strategic orientations.

In addition, there are several other areas in need of further research. Although Australian manufacturing companies display an attractive context, future work should test this study's hypotheses in other countries where natural environmental concerns are also given priority. In addition, we only employed market and financial measures of performance. Future research should include social performance dimensions, and the impact of NEO on employee attitudes and behavior toward their employers should be explored. Our study is also limited in that it incorporates only short-term sales figures. Future research should utilize longer term sales data, which will enable researchers to capture the fluctuations in sales caused by periodic disruptions in the market. Finally, future research that employs longitudinal research design may shed light on the causal relationship between NEO and performance.

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Appendix A. Confirmatory factor analysis

Constructs	λ	t value
Corporate social responsibility [α=.81, CR=.81, AVE= 42.5%, $\chi^2(9)$= 11.867, P=.221, GFI=.97, CFI=.99, RMSEA=.048]		
This organization...		
corrects conditions caused that endanger the environment	.53[a]	–
eliminates the release of any substance that may cause environmental damage	–[b]	–
safeguards all natural habitats affected by the operations	–[b]	–
sustainably uses renewable natural resources (e.g., water, soil, forests)	.69	5.53
conserves nonrenewable natural resources (e.g., oil, natural gas)	–[b]	–
eliminates physical waste from the operations.675.46		
reduces physical waste through recycling	.62	5.22
disposes of physical waste through environmentally safe methods	.65	5.38
eliminates the use of products that cause environmental damage	.73	5.70
informs our customers of the environmental impacts of the products marketed	.53	4.72
Entrepreneurship [α=.88, CR=.88, AVE= 55.6%, $\chi^2(5)$= 7.429, P=.191, GFI=.98, CFI=.99, RMSEA=.059]		
This organization...		
has a cultural emphasis on innovation and R&D in environmentally friendly products	.83[a]	–
has a high rate of environmentally friendly product introductions	.79	10.63
has a bold, innovative, environmentally friendly product development approach	.89	12.45
has a proactive posture to the environmental market	.62	7.72
has an aggressive posture toward competitors	–[b]	–
has a strong inclination for high risk, high potential return projects in the field of environmentally friendly products	.55	6.64
has a market environment that encourages boldness to achieve natural environmental objectives	–[b]	–
is first to introduce new environmentally friendly technologies and products	.74	9.69
when faced with risk in natural environmental market, adopts an aggressive, bold posture	–[b]	–
Environmental commitment [α=.93, CR=.93, AVE= 70.3%, $\chi^2(9)$= 20.656, P=.014, GFI=.95, CFI=.98, RMSEA=.097]		
This organization has...		
committees dedicated to dealing with environmental issues	.90[a]	–
a formal plan for dealing with environmental issues	.93	17.7
formal documents describing an environmental plan	.90	16.04
manuals detailing environmental procedures	.81	13.06
employee training programs on environmental procedures	.78	12.02
employees whose job it is to deal with environmental issues	–[b]	–
a reward system that recognizes environmental achievements	–[b]	–
environmental information in external communications	.69	9.88
environmental reviews or audits	–[b]	–

Appendix A (*continued*)

[a] Scale item fixed to a value of...
[b] Deleted item.

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