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Environmental sustainability orientation and financial resources of small manufacturing firms in the Philippines

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Abstract

Purpose – This study aims to challenge the conventional view that resources determine the extent of the environmental sustainability orientation (ESO) of small firms in a developing Southeast Asian country context. First, this study attempts to develop a measurement model of ESO of small firms in the manufacturing sector in the Philippines. Second, the study explores the impact of the financial resources on the ESO of firms.

Design/methodology/approach – The study uses survey data from 166 small manufacturing firms in three Philippine cities. Multiple regression modelling is used to estimate the relationships between firm resources and ESO.

Findings – The results indicate that ESO is a multi-dimensional construct with three facets – i.e. awareness of, actions for, and appreciation of environmental sustainability. The empirical evidence does not support the conventional firm resources-ESO proposition.

Research limitations/implications – A proactive ESO is not necessarily beyond the reach of resource-constrained small firms. The generalisability of the findings, however, is limited to small manufacturing firms in The Philippines.

Practical implications – This study informs owner-managers of small firms that a proactive ESO does not largely depend on financial resources. Government policies and programs to encourage small firms to become sustainable should focus not just on financial forms of assistance.

Originality/value – To date, this is the only Philippines-based study and one of the scarce small firm-focused studies that examine the proposition that small firms are unable to pursue a proactive ESO due to resource constraints.

Keyword(s):

Environmental sustainability orientation; Small firms; Small business; Manufacturing firms; Small to medium-sized enterprises; Philippines.

Introduction

Environmental sustainability has become one of the widely discussed issues in the literature on corporate responsibility and business ethics in recent years. A popular view is that business firms are expected to have a triple bottom line approach (Elkington, 1994) in the conduct of business (Kleine and Hauff, 2009; Zwetsloot and van Marrewijk, 2004; Luken and Stares, 2005) in order to become sustainable in the long run. While sustainability in business has many forms, the current study focuses on one important aspect of the triple bottom line approach to sustainability which is the firm's responsibility towards the ecological or natural environment. The triple bottom line approach suggests that firms need to incorporate into their overall strategic agenda not just the economic gains but also the environmental dimensions of business (Masurel, 2007; Zwetsloot and van Marrewijk, 2004).

Nowadays, firms are either mandated by law or encouraged to adapt measures that can either reduce the negative impact of their economic activities on the natural environment or contribute to environmental preservation or re-generation (Fraj-Andres *et al.*, 2009; Martin-Tapia *et al.*, 2010; Kuckertz and Wagner, 2010). Firms are therefore, encouraged to develop and nurture their environmental sustainability orientation (ESO) which in this study is being referred to as the firm's overall proactive strategic stance towards the integration of sustainable natural environmental management practices into their core business operations. The firm's ESO propels the firm in adopting and implementing business practices that avoid or minimise the firm's negative impact on the natural environment and proactively contribute to natural environmental management.

While there is a plethora of studies on how large and multinational firms demonstrate their commitment towards the triple bottom line approach to sustainability in business, little is known about how small firms demonstrate their strategic orientation towards natural environmental sustainability (Dangelico and Pujari, 2010; Martin-Tapia *et al.*, 2010; Kuckertz and Wagner, 2010; Lee and Klassen, 2008; Perrini *et al.*, 2007). Previous studies tend to be conceptual or theoretical in their investigation of how and why small firms develop and demonstrate their ESO (Kuckertz and Wagner, 2010; Linnenluecke and Griffiths, 2010; van Marrewijk and Werre, 2003). There is no study to date that attempts to measure empirically the ESO of small firms in a developing country setting. Small firms such as small and medium-sized enterprises (SMEs) comprise a large majority of firms in all economies across the globe, particularly in emerging economies, and have significant contributions to economic activities (Udayasankar, 2007). It is important to determine how well small firms respond to the imperatives of becoming environmentally sustainable businesses, as many firms remain confused about whether and how to internalise natural environmental considerations into their core business operations (Roy and Therin, 2008; Udayasankar, 2007; Russo and Perrini, 2010).

One plausible explanation on why small firms are viewed as generally unable to develop and maintain their ESO is lack of resources. This argument is enshrined in the resource-based view of the firm (RBV), which highlights the critical role of various types of resources in the firm's overall strategic orientation and configuration in order to develop its competitive

advantage and achieve better performance (Barney, 1991; Wernerfelt, 1984; Grant, 1991). A resource-constrained firm is unlikely to integrate environmental sustainability measures and become proactive in its strategic stance towards natural environmental sustainability if it can barely meet its resource needs to remain economically viable. Given the universal view that small firms do not have as many resources as large, multinational firms, the general assumption suggests that small firms such as SMEs have very low levels of ESO relative to larger firms. This would probably explain the scarcity of small firm-focused research on sustainability topics that focus on why some firms pay attention to the environment whereas others do not (Gadenne *et al.*, 2009; Jamali *et al.*, 2009).

The present study attempts to address the research gaps discussed above by exploring the extent of ESO of small firms in The Philippines, one of the developing economies in the Asian region. Small firms play a significant and central role not only in the economic development of The Philippines but also in the national campaign to minimise the negative impact of socio-economic activities on the natural environment. The study focuses on the overall strategic orientation of the firm towards one specific aspect of the triple bottom approach to sustainability, which is on natural environmental sustainability. The aims of this exploratory study are two-fold. First, the study will identify the various business activities that demonstrate the strategic orientation of small firms towards avoidance or minimisation of the negative impact of business on the natural environment and protection and regeneration of the natural environment. Second, the study will determine the impact of financial resources on the ESO of firms.

The paper begins with an overview of environmental sustainability in the context of small firms. This is followed by a conceptual discussion of ESO. The paper then presents a discussion of the propositions on the role of resources on the firm's ESO, followed by a discussion of the results of the empirical study. Finally, the paper concludes by discussing the implications of the study and identifying specific directions for future research.

Small firms and environmental sustainability

The concept of “environmental sustainability” is now at the forefront of debates on how businesses can exercise their corporate responsibility in the midst of natural environmental issues on a global scale (Kleine and Hauff, 2009; Dangelico and Pujari, 2010; Agarwala, 1993). Popular discussions and audio-visual presentations of the presumed causes and doomsday-like effects of climate change, for example, have reinforced the importance of environmental sustainability not just in business activities, but in all human endeavours. In 1987, the United Nations' World Commission on Environment and Development — also known as the Brundtland Commission – issued its report on the imperatives of sustainability and sustainable development. The report defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland Commission, 1987, p. 54). Since then, sustainable development and sustainability have become prominent concepts in the business literature (Evans and Sawyer, 2010; Bos-Brouwers, 2010). Tilley and Fuller (2000) noted that environmental sustainability has become ever more important for the business sector as a way of transcending the conflicts between economic imperatives and environmental goals, thereby acting as a catalyst in transforming business activities to be less damaging to the natural environment.

The triple bottom line approach to sustainability in business (Elkington, 1994) is one of the widely accepted frameworks to understand the role of business in sustainability and sustainable development. The triple bottom line approach explains that firms need to pay attention to the economic, ecological and social aspects of business if they must be sustainable in the long run (Elkington, 1994). Economic sustainability refers to the responsibility of the firm to generate profit to maintain its viability as an enterprise. Social sustainability refers to the need to address the different expectations of various stakeholders. Finally, environmental sustainability, which is the main focus of the current study, refers to the need for firms to manage the ecological or natural environmental impact of their business (Elkington, 1994).

Adoption of the triple bottom line approach suggests that businesses regardless of size have to face the additional pressure to become environment-friendly in all aspects of their operation (Alcaniz *et al.*, 2010; Agarwala, 1993). They need to demonstrate that they have a system in place to minimise or mitigate the negative externalities that come from their economic activities (Fraj-Andres *et al.*, 2009). Firms need to make their business activities more sustainable as a manifestation of their overall orientation towards protecting the natural environment. This, however, may not be a straightforward undertaking as previous research suggests that many firms are still confused about whether and how to integrate environmental considerations into their mainstream business activities (Roy and Therin, 2008). There is a plethora of studies on how large, multinational companies implement environmental sustainability-related measures oftentimes under the banner of corporate social responsibility (Alcaniz *et al.*, 2010; Lee and Klassen, 2008; Agarwala, 1993). This is not necessarily the case for small firms where there appears to be a systematic absence of research on how small firms develop and implement environmental strategies (Martin-Tapia *et al.*, 2010). There is limited literature on environmental management practices of small firms such as SMEs particularly in developing economies (Luken and Stares, 2005). Previous studies tend to remain conceptual or have reported results of case study research perhaps due to the emergent nature of the concept of environmental sustainability and its relationship with business (Evans and Sawyer, 2010; Kuckertz and Wagner, 2010).

Small firms

The importance of small firms in the sustainability debate stems from their significant contribution to global production and consumption. Around the world, small firms such as SMEs comprise the largest share of the total number of firms, employment and gross domestic product (Ayyagari *et al.*, 2003; Organisation for Economic Co-operation and Development, 2009). In The Philippines, there are more than 750,000 small firms categorised as SMEs. They generate more than 70 per cent of employment and contribute 30 per cent to the country's gross domestic product (Roxas *et al.*, 2009; Aldaba, 2008). While small firms like SMEs are often considered as the engine of economic growth (Roxas *et al.*, 2009), their aggregate business activities may have potential negative impact on the environment as they consume energy and produce wastes and other by-products of their core business operations.

To date, no comprehensive pollution or resource statistics exists for small firms making it difficult to determine the nature and extent of their contribution to environmental degradation (Organisation for Economic Co-operation and Development, 2008). In The Philippines, the relatively loose system of monitoring the environmental impact of businesses, especially of small firms and the sterile regulatory quality associated with the implementation of laws and

guidelines for environmental protection suggest that small firms may have significant negative impact on the natural environment more than what is currently envisaged.

On a global scale, there are rough estimates that small firms contribute to over 70 per cent of all pollution and 60 per cent of carbon emissions (Martin-Tapia *et al.*, 2010; Walker *et al.*, 2008). It is assumed that the sum total of the environmental impacts of small firms outweighs the combined environmental impacts of large firms given the much larger number of the former (Martin-Tapia *et al.*, 2010). An Organisation for Economic Co-operation and Development (2008) report noted the increase of the relative share of emissions from small firms such as SMEs during the past 30 years compared to emissions from large industrial installations, though the overall emissions have reduced from the production facilities of both large and small firms. The report further noted that small firms may not generate large quantities of pollution per individual operating site, but, due to their large number, they may have a significant collective environmental impact especially in the urban areas, where they often are located (Organisation for Economic Co-operation and Development, 2008). This picture of the environmental impact of small firms necessitates an investigation on whether they are capable of fortifying their strategic stance towards environmentally sustainable business operations.

Environmental sustainability orientation

For purposes of this exploratory study, environmental sustainability orientation (ESO) refers to the overall proactive strategic stance of small firms towards the integration of natural environmental concerns in their business operations. Firms with higher levels of ESO are likely to have institutionalised in its overall strategy, structure, processes and activities a wide range of measures designed to either reduce the firm's negative impact on the natural environment or to positively contribute to environmental protection, preservation or re-generation. The current study builds on previous studies dealing with sustainable business practices (Sinha and Akoorie, 2010), corporate sustainability (van Marrewijk and Werre, 2003), sustainability orientation (Kuckertz and Wagner, 2010), sustainable entrepreneurship (Masurel, 2007) eco-sustainability orientation (Branzei and Vertinsky, 2002) and corporate environmentalism (Banerjee, 2002). The definition of sustainability in business is discussed in more detail in the work of van Marrewijk (2003).

Conceptually, ESO stems from the conventional notion of sustainability in business suggesting that firms need to integrate environmental concerns into their culture, decision-making, strategy, and business operations and in their interactions with various stakeholders (Alcaniz *et al.*, 2010; Linnenluecke and Griffiths, 2010; Zwetsloot and van Marrewijk, 2004). This type of corporate responsibility aims to broaden the scope of business goals to include making a positive contribution to the firm's external natural environment and to the overall quality of life in communities and societies at large (Branzei and Vertinsky, 2002; Zwetsloot and van Marrewijk, 2004).

The firm is viewed to have high levels of orientation and commitment to the preservation of the natural environment when they implement sustainable business activities triggered by an organisational-wide feeling of responsibility and accountability for the firm's conduct and its potential impact on the natural environment (Branzei and Vertinsky, 2002). ESO is considered as a firm-level strategic construct that takes into account the organisational-wide manifestations of the firm's awareness, engagement and commitment to issues, activities and programs related to natural environmental sustainability (Black and Härtel, 2004; Carroll,

1979, 1991). As a firm-level strategic orientation, ESO must be ingrained within the grand business philosophy of the firm and forms part of the firm's overall strategic configurations that guide the business or operational plans, programs and activities (Carroll, 1979).

Firms may demonstrate in different ways their ESO. Some firms may simply implement measures for pollution prevention or reduction (Keijzers, 2002). Others may be much willing to invest in environment-friendly technologies and practices or to devote persistent efforts and resources to address environmental issues and eventually internalise environmental issues in the firm's business operations (Branzei and Vertinsky, 2002).

While large, multinational firms are likely to have instituted various forms of sustainability measures given their abundant resources, little is known, however, regarding the nature and extent of ESO among small firms. A study suggests that sustainable practices differ between small and large firms given the structural, cultural and resource-based differences between these two types of firm (Bos-Brouwers, 2010). It is important, therefore, to investigate the ways through which small firms like SMEs exercise their ESO given their unique organisational characteristics.

The role of resources

This lacuna in the literature on ESO in the small business context is largely explained by the notion that the implementation of sustainability-related or environmental initiatives requires substantial resources. One stream of thought posits that small firms do not have the capability to implement sustainable business practices due to their liability of smallness (Sinha and Akoorie, 2010). Small firms are noted to have no sufficient resources to adopt or develop and implement pro-environment or sustainability measures (Court, 1996; Holland and Gibbon, 1997). However, Sinha and Akoorie (2010) noted that firm size alone cannot explain the adoption of environmental practices by firms. In fact, flexibility and adaptability are qualities of small firms that make them more favourable entities for the uptake of sustainable business practices (Sinha and Akoorie, 2010).

Resources and ESO

The inherent inability or difficulty of small firms to adopt or implement sustainable environmental programs and activities is largely attributed to their limited or lack of resources (Holland and Gibbon, 1997; Sinha and Akoorie, 2010). The resource-based view of the firm (RBV; Barney, 1991; Wernerfelt, 1984) suggests that a firm's strategic orientations and configurations geared towards the development of competitive advantage and better performance depend largely on the nature of the resources possessed by the firm. RBV further suggests that a firm can pursue a particular strategic stance such as ESO if it possesses sufficient resources to support the activities associated with such strategic orientation (Galbreath, 2005).

Previous studies tend to support this argument. For example, a study of 136 Canadian manufacturing SMEs noted the importance of resources and resource acquisition to the ability of firms to address environmental issues and implement a formal environmental management system at the firm level (Roy and Therin, 2008). A study of 22 small exporting firms in four Asian countries suggested that smaller firms tend to have difficulty in meeting the operating and monitoring costs of social and environmental requirements of their global buyers (Luken and Stares, 2005). Other barriers to implementation of environmental initiatives include lack

of expertise in environmental management, technical, financial and time issues, and lack of information and training about environmental issues (Borga *et al.*, 2009; Court, 1996; del Brio and Junquera, 2003; Holland and Gibbon, 1997). These studies suggest that ESO or the implementation of sustainable environmental programs and activities is a function of the resources possessed by the firm – a view that is well enshrined in the RBV.

However, there are studies that argue otherwise. A recent study by Sinha and Akoorie (2010) suggests that smaller firms are actually in a better position to have intense ESO because of their inherent flexibility and adaptability. These qualities enable these smaller firms to respond to environmental pressures relatively quickly (Sinha and Akoorie, 2010). Likewise, a study of 108 SMEs in the automotive repair sector in Spain noted that despite their limited resources, SMEs have the capability to pursue various types of environmental strategies (Aragon-Correa *et al.*, 2008). While these sustainability measures may not be as grandiose, formal and sophisticated as that of the environmental sustainability management systems that large firms implement, these measures tend to complement the nature and scale of business operations of small firms (Sinha and Akoorie, 2010). The scant empirical evidence suggest that conventional firm resources such as finance may not be necessarily the prime determinant of adoption and intensification of a firm's ESO. The vision of the founder of the enterprise, for example, and ability to manage external relationships, have been shown to have a more significant positive impact on the intensity of sustainability orientation than financial resources (Aragon-Correa *et al.*, 2008). This divergence of views on the role of resources on the ability of small firms to pursue, develop and nurture their ESO is evidence of the need for more research on the topic.

The next section is a discussion of the propositions on the impact of resources on the ESO of small firms. The goal of the analysis is to explore whether conventional types of resources (such as financial resources) are related to higher levels of ESO.

Financial resources

The adoption and implementation of natural environmental management systems and practices require financial resources (Aragon-Correa *et al.*, 2008). Small firms may not have the necessary excess financial capacity to support such endeavours. They tend to have very limited financial resources to support those extra activities beyond their core business operation (del Brio and Junquera, 2003; Jamali *et al.*, 2009). Therefore, adoption of environmental practices, especially those over and above the requirements set by law and which do not necessarily form part of the mainstream activities of the business such as manufacturing and selling, is viewed as an unnecessary burden (Masurel, 2007; Mir and Feitelson, 2007). Even if these small firms are willing to adopt or develop within their firms more programs or activities towards environmental management for sustainability, the generic difficulty involved in gaining access to finance remains a major hindrance to the firm's ability to demonstrate its ESO (Perrini *et al.*, 2007). In a study of 1,071 Danish SMEs in 2005, Pedersen (2009) noted that the firm's financial resource is one of the critical determinants of the extent of involvement of firms in activities as part of their corporate social responsibility. Moreover, Sarbutts (2003) suggests that SMEs are more likely to engage in activities such as sustainable business practices as part of the firm's corporate social responsibility when these are perceived to have clear, measurable and short- to medium-term financial benefits. This return on investment (ROI) orientated perspective of sustainability orientation explains the low uptake of sustainability initiatives among small

firms due to the long-term and often intangible rewards of these initiatives. Hence, this study would like to explore the first proposition as follows:

P1. The firm's financial resources are positively associated with higher levels of ESO.

Firm size

The size of the firm normally represents the nature and amount of resources that are available to the firm (Bonaccorsi, 1992; Penrose and Pitelis, 2009; Lepoutre and Heene, 2006). Smaller firms are usually associated with scarce resources, lower scale of operations as well as lower visibility relative to large firms (Udayasankar, 2007). Scarce resources hinder their ability to do more than what is prescribed by law in terms of environmental management. Small-scale operations make these firms less visible to government authorities, pressure groups and other environmental management stakeholders (Udayasankar, 2007). Low visibility inhibits the proclivity of small firms to proactively adopt sustainability measures that they may perceive to be unnecessary. All these factors contribute to the low uptake of programs and activities that are demonstrative of the firm's ESO. In one study, Martin-Tapia *et al.* (2010) noted a positive relationship between the size of the firm and level of advancement of environmental strategies of 123 exporting SMEs in Spain. Similarly, Perrini *et al.*'s (2007) study of 3,680 Italian firms suggests that firm size is a factor that influences the nature and extent of the firms' conduct towards corporate social responsibility.

However, given that small firms in many developing and emerging economies are relatively resource-constrained compared to large firms, little is known whether small firms are indeed incapable of pursuing a more proactive ESO amidst resource scarcity (Walsh and Lipinski, 2009). It is important therefore to investigate the second proposition:

P2. Firm size is positively associated with high levels of ESO.

Age of the firm

The age of the firm is commonly used as another proxy for the firm's overall stock of resources (Wu, 2008). It represents the accumulated experience in business operations, which can explain the nature and extent of adoption of business practices towards environmental management and protection. The normative view is that firms learn in time, which builds the firm's specific set of capabilities that enable them to deal more systematically with the demands of their external environment. Adoption, development or implementation of sustainability initiatives at the firm level require knowledge and capabilities on what initiatives fit the needs of the firm as well as how to undertake such initiatives. These knowledge and capabilities can be expected to come with experience and therefore age of the firm. Furthermore, firms at the early stage of their business operation are more likely to be on survival mode and it is only when they have crossed the minimum survival threshold that they begin to incorporate other ethical or philanthropic responsibilities (Vergalli and Poddi, 2009; Orlitzky and Benjamin, 2001). Hence, this study explores the third proposition that:

P3. Firm age is positively related to higher levels of ESO.

Advertising budget

Engagement in advertising activities is also a distinctive reflection of the financial resources of a firm. As previously mentioned, small firms are generally limited in their financial capital and managerial resources (Walsh and Lipinski, 2009). It is logical to argue that small firms also have limited resources for marketing programs (Gabrielli and Balboni, 2010; Reijonen, 2010). More often than not, small firms with limited resources tend to shy away from advertising and would rather rely on other informal means of marketing (Gabrielli and Balboni, 2010). As a proxy for firm resources, advertising budget is an indicator that the firm has the necessary resources to support “non-essential” business initiatives with no immediate financial returns such as those activities related to ESO. Hence the study explores the fourth proposition that:

P4. Firms with larger advertising budgets are positively associated with higher levels of ESO.

Sample and data

The study involves a survey of 214 SMEs in the food-processing sector in four cities in The Philippines. More than 90 per cent of the registered businesses in The Philippines are classified as small (up to 99 employees) and medium-sized (100 to 199 employees) enterprises (National Statistics Office, 2010). Technically, Philippine SMEs belong to the category of small firms according to World Bank and OECD standards (Ayyagari *et al.*, 2003; National Statistics Office, 2010; Organisation for Economic Co-operation and Development, 2004). The average number of employees as well as the value of sales used to classify Philippine small firms is likely to be similar to that of small firms as classified in the World Bank and OECD databases. This classification also takes into account the relatively smaller size of the Philippine economy relative to that of other countries in the OECD/World Bank SME database (Ayyagari *et al.*, 2003; Organisation for Economic Co-operation and Development, 2004). An estimated 750,000 SMEs form the backbone of the economy in The Philippines and account for almost 70 per cent of the country's total employment, 30 per cent of the country's gross domestic product (GDP) and more than 25 per cent of the country's total export revenue (Aldaba, 2008). SMEs also represent almost 60 per cent of all exporting firms in the country's manufacturing sector (National Statistics Office, 2010).

The food-processing sector is one of the top three manufacturing sectors in The Philippines in terms of employment and value of output. In 2009, there were approximately close to 11,000 food and beverage manufacturing firms in the country. In 2008, the food processing sector contributed more than \$US4.3bn (around 6.5 per cent) to the total manufacturing output of The Philippines (National Statistics Office, 2010). It contributed 7.8 per cent (around 60,000 employees) of the total employment in the manufacturing sector. With an annual growth of 8 per cent to 10 per cent, the food processing sector is noted as one of the most dynamic, vibrant and promising manufacturing sectors in The Philippines (National Statistics Office, 2010).

The data collection process involved a survey of owners and/or managers of firms in 2009 in coordination with a local non-government organisation that advocates sustainable development in the Southern region in The Philippines. A sample of 214 firms identified from the local government's business registry and membership registry of local trade associations was first targeted. A number of fieldworkers were used to personally deliver and collect the questionnaires to and from participants in order to ensure a high response rate.

From the returned questionnaires, a total of 166 responses (78 per cent) were deemed fully complete and were utilised for purposes of the present analysis. All of the 166 firms were small firms with five to 50 employees (mean=17) and with ages ranging from one year to 54 years (mean=14 years).

The cross-sectional survey method within the positivist tradition of scholarly inquiry was used in the study for the following reasons. First, the study aims to develop a measure of ESO. Gathering data from a relatively large number of respondents can be systematically supported by the survey method (Czaja and Blair, 2005). Second, the survey method allows for a systematic determination of estimates of the population parameters through sampling that will allow the generation of rigorous, valid, reliable, and replicable results (Zikmund, 2003). Finally, the survey method offers an acceptable way of exploring the ESO of the sample firms as well as testing the preliminary propositions advanced in this study (Czaja and Blair, 2005; Cavana *et al.*, 2001).

Measurement

Environmental sustainability orientation

The preliminary review of the relevant literature showed that there is no currently existing measure of ESO that fits the small business or SME sector in a developing country context such as The Philippines. Furthermore, to date there is limited or no publicly available environmental performance data of firms, especially small firms, that can be used as baseline information to measure ESO (Aragon-Correa *et al.*, 2008). It was imperative, therefore, to develop a measure of ESO for purposes of this study following the standard process of scale development (Bagozzi *et al.*, 1991).

The first step of measurement development requires a preliminary review of the literature to explore whether there are relevant concepts and measures that are closely associated with the ESO construct that allows for analysis at the firm level. Some of these concepts and measures include corporate sustainability (van Marrewijk and Werre, 2003), proactive corporate environmental strategy (Aragon-Correa and Sharma, 2003), natural environmental management (Aragon-Correa, 1998), environmental strategy (Aragon-Correa *et al.*, 2008), environmental practices (Gonzales *et al.*, 2008), environmental awareness, attitudes and practices (Gadenne *et al.*, 2009), environmental commitment (Roy and Therin, 2008), environmental behaviour (Mir and Feitelson, 2007), and environmental management capabilities (Lee and Klassen, 2008). Based on these existing measures, a list of 43 items was developed to describe the different environmentally sustainable practices that can possibly be done at the firm level in a developing economy context.

The second step is the review and validation of the list of items by a panel of experts who are familiar with the topic or have done studies in the field. A panel of experts from academia, a government agency (i.e. the country's Department of Trade and Industry) and industry (i.e. local chamber of commerce and trade associations) was requested to review the items in order to determine their content, comprehensiveness, parsimony, and face validity (Cavana *et al.*, 2001). The panel recommended a relatively more streamlined list of 25 items by dropping from, combining and adding new items to, the original 43-item list.

The third stage was an interview of five owner-managers of small firms in the food-processing sector. The interviewees were asked to evaluate the list of items in terms of

familiarity, relevance, importance, and applicability in actual business operations. This process resulted in the reduction of items to 18 statements that are useful in initially describing the ESO construct. The 18 items composed of statements (see the Appendix) for which respondents indicate the extent of their agreement or disagreement using a seven-point Likert scale. This self-report measure of ESO is considered acceptable given the lack of publicly available data on the environmental practices of small firms, especially in a developing country like The Philippines.

Firm resources

As a construct, financial resources was measured by asking respondents to indicate using a seven-point Likert scale whether they agree or disagree on the seven items describing the financial resources available and accessible to the firm (see the Appendix). The size of the firm was measured by asking respondents to indicate the number of their full-time employees. The age of the firm was measured by the number of years of business operation. Advertising budget was measured by a scale of 1 (up to PHP10,000) to 5 (over PHP80,000) to account for the total amount that a firm usually spends for advertising campaign every year.

Preliminary analysis

The following sections present the results of response bias analysis and common method bias analysis. These analyses were undertaken to improve the quality of the data that were used in subsequent analysis.

Response bias analysis

Non-response bias was examined to add rigour to this exploratory study (Babbie, 2007). Non-response bias occurs when respondents and non-respondents differ in the major variable(s), in which case the population parameters of these variables can be over- or under-estimated (Armstrong and Overton, 1977; Rogelberg and Stanton, 2007; Ullman and Newcomb, 1998). To determine whether the data contained non-response bias, a comparison between early and late respondents on key variables was performed as a matter of non-response bias impact assessment strategy (Rogelberg and Stanton, 2007). This non-response bias impact assessment strategy is well known in the literature as wave analysis (Lankford *et al.*, 1995).

Early respondents were identified as those small firm owner-managers from whom the field enumerators collected the duly filled out questionnaire by visiting only twice – one time for distribution and another for collection. Late respondents were those which the enumerators had to visit more than twice – one time for distribution and twice or more times in order to collect the filled out questionnaire. These late respondents were likely to be non-respondents if the enumerators did not take the extra effort of visiting them repeatedly and reminding them to fill out the questionnaire. This method of differentiating early and late respondents is consistent with previous studies treating early respondents as those who replied immediately without any delay, hesitation nor reluctance and late respondents as those who showed reluctance but who later participated in the survey after one or more follow-up visits, telephone calls or reminder letters (Biemer, 2001; Lankford *et al.*, 1995). Accordingly, there were 98 (59 per cent) early respondents and 68 (41 per cent) late respondents identified in the study.

The two groups were compared across a set of managerial and firm characteristics using independent sample *t*-test (for continuous variables) (Field, 2005) and Pearson's χ^2 test (for discrete variables) (Greenwood and Nikulin, 1996). The two groups did not differ significantly in terms of age of the owner-managers, educational level, age of business, and firm size. The foregoing analysis suggests that non-response bias does not appear to be an issue in this study.

Common method bias analysis

Two major tests were performed to determine the presence of common method bias:

1. Harman's single factor test (Harman, 1976; Podsakoff *et al.*, 2003); and
2. partial correlation technique using a marker variable (Lindell and Whitney, 2001).

Harman's single factor test explains that common method bias is present when a single factor emerges or one factor accounts for more than 50 per cent of the variance of the items in the factor analysis (i.e. unrotated matrix), whereby all items measuring all the variables in the study are allowed to load simultaneously (Harman, 1976). All items measuring all the constructs were factor analysed using the maximum likelihood technique with Varimax rotation. Results showed that no single factor emerged and no factor accounted for more than 50 per cent of the variance. These findings suggest that under Harman's single factor rule, common method bias was not an issue in the current study.

Using Lindell and Whitney's (2001) partial correlation technique, a variable called self-efficacy measured by five items was used as the marker variable in the questionnaire. This construct was established a priori to have no theoretical or conceptual relationship with at least one of the major variables under study (Malhotra *et al.*, 2006). Using this technique, a data set is said to be contaminated with common method bias if the correlation coefficients amongst the variables significantly change when the effects of the marker variable are controlled for (Lindell and Whitney, 2001). Using SPSS's partial correlation analysis function, a correlation matrix was developed to examine the zero-order correlation coefficients of the ESO, firm resources and the marker variable. The results showed that the marker variable had correlation coefficients close to zero relative to the other variables. The correlation coefficient findings further suggested that common method bias was not an issue in the current study (Podsakoff *et al.*, 2003). When the marker variable was controlled for in the correlation analysis, there were no significant changes in the relationships at the 95 per cent level of confidence amongst the variables. The results further suggested that common method bias, *per se*, could not explain the results of the current study.

Main analysis

At this stage of the analysis, the 18 ESO items and seven financial resources items were examined through exploratory factor analysis (EFA) using maximum likelihood technique with Varimax rotation to determine the underlying structure of responses to the items (Hair *et al.*, 2009; Field, 2005). Exploratory factor analysis (EFA) was performed in order to define the underlying structure and dimensionality of the constructs under investigation (Cavana *et al.*, 2001; Hair *et al.*, 2009). Creating a measure of ESO requires an exploratory approach to measurement model development. While the items used to measure ESO were culled from various studies as discussed above, it was necessary to perform factor analysis in an exploratory fashion for purposes of data reduction and data summarisation (Thomson, 2004).

By doing so, the constructs that will be used in subsequent analysis are composed of purified items or measures (Hair *et al.*, 2009).

The constructs and their corresponding indicators/items were judged as reflective (rather than formative) based on the following criteria:

- the direction of causality is from construct to items;
- the indicators are manifestations of the construct;
- changes in the construct do cause changes in the indicators;
- indicators of a construct have the same or common theme;
- dropping an indicator does not alter the conceptual domain of the construct; and
- indicators of a construct co-vary with each other (Jarvis *et al.*, 2003; Diamantopolous and Siguaw, 2006).

Reflective indicators were developed with the view that they all measure the same underlying phenomenon based on the theoretical and conceptual domains of the construct capturing that specific phenomenon (Diamantopolous and Siguaw, 2006).

The results of EFA revealed three underlying factors (see Table I). The results of the factor analysis suggest that ESO as measured in this study has three facets. The first factor consisted of six items which describe the firm's overall familiarity or knowledge of environmental issues and practices. This factor was subsequently labelled as "awareness of environmental sustainability issues". The second factor consisted of eight items that describe the different environmentally sustainable practices or activities that are actually done by the firms. Accordingly, this factor was named "actions for environmental sustainability". The last factor consisted of four items that reflect the reported perceived benefits of implementing environmentally sustainable practices. This factor was labelled "appreciation of environmental sustainability". The three factors showed highly acceptable levels of homogeneity as indicated by Cronbach's α values ranging from 0.88 to 0.89 given the exploratory nature of the study (Hair *et al.*, 2009; Field, 2005).

The same process of exploratory factor analysis was performed on the seven items measuring the financial resources of the firm (see Table II). The result showed only one underlying factor subsuming all seven items. This factor has an acceptable level of homogeneity as shown by its Cronbach's α value.

Based on the mean, standard deviation values, and correlation coefficients of the variables as shown in Table III, the sample firms were more inclined to "agree" with the items describing the three facets of ESO. For example, the mean value of 5.62 for the construct "appreciation of environmental sustainability" suggests that the sample firms tend to "slightly agree" or "agree" with the statements subsumed under this construct. On the other hand, the relatively low value of the mean for financial resources indicates that the sample firms tend to "slightly disagree" with the statements indicating low levels of financial resources. Furthermore, the sample firms are relatively small (17.95 employees) and young firms (14.10 years old) with an average advertising budget of between PHP10,000 and PHP50,000 annually, as indicated by the mean of 2.56 in the five-point scale.

Testing the propositions

Multiple regression was used in order to test the propositions of the current study. The four independent variables representing firm resources were regressed to the three facets of ESO. The analysis used the ordinary least squares (OLS) method with confirmatory testing using Stata's robust function. Robust regression is recommended as a confirmatory technique to deal with common regression issues including outliers and heteroscedasticity (Acock, 2010; Hamilton, 1992). In an exploratory study, the robust regression technique will add rigour to the results of the study as it has the capability to address issues that the OLS regression may not be able to deal with given the lack of previously available empirical baseline data on the topic.

The results (see Table IV) indicate that only firm age is consistently and positively associated with the three facets of ESO. The other proxy indicators of firm resources do not indicate any significant relationship with ESO. The results show that the empirical evidence supports only *P3* among the four propositions explored in this study. However, the r^2 value suggests a very small effect size, which is indicative of the low power of the independent variables to explain the variances of the three dependent variables. The small sample size and the lack of diversity of the sample firms in terms of firm size may have contributed to this small effect size. Furthermore, the low coefficients of firm age as it relates to the three facets of ESO suggest that the relationship may be significant but inadequate in terms of substantive meaningfulness (Pedhazur, 1982).

Discussion, conclusion and implications for future research

The results of this exploratory study on the ESO of small firms in The Philippines challenge two popular notions of environmental sustainability in the Philippine business context. First, the study offers empirical evidence that small firms are very much capable of instituting sustainable business practices regardless of their resources. This is contrary to the view that small firms are generally unable to pursue sustainable practices relative to larger firms (Court, 1996; Holland and Gibbon, 1997). While these sustainability-orientated activities may not be as grand in scale as those done by large firms, it is sufficient to recognise the evidence that small firms in the Philippines also contribute to sustainable development in ways proportionate to their size. One plausible explanation for this particular finding is that financial resources are essential but not the ultimate determinant on why firms pursue a more proactive ESO.

The majority of the sample firms are aware of various environmental issues confronting the local communities where they do business. In many of the sample firms, awareness was translated into specific actions towards environmental sustainability. Secondly, the empirical evidence suggests that firm resources are not necessarily the prime determinants for a firm to have intense levels of ESO. The lack of resources, which is an inherent problem in small firms, does not appear to be a major barrier to becoming sustainability-orientated. Resources are important to fuel strategy-making and implementation within the firm. However, the results of this exploratory study suggest that there may be other salient organisational factors that propel the ESO of small firms. Factors such as organisational culture (Linnenluecke and Griffiths, 2010), willingness and creativity (Martin-Tapia *et al.*, 2010; Linnenluecke and Griffiths, 2010; Lee and Klassen, 2008; Keijzers, 2002), for instance may offer better explanations on why some small firms are more inclined to incorporate sustainability issues in its business decision-making and activities than others.

This study also provides new insights on current understanding of ESO as a firm-level strategic stance towards proactive environmental responsiveness and adaptation. The study's initial finding that ESO in the context of small firms in a developing economy has three facets suggests the multi-dimensionality of the construct. The first facet – i.e. awareness of environmental sustainability issues – captures the extent to which firms are aware of the pressing environmental issues that may have profound actual or potential impact on all residents of the locality, including the business firms. Awareness of environmental issues is a basic but important component of a firm's strategic orientation as a precondition towards the identification, adoption or implementation of measures in response to those issues.

The second facet – i.e. actions for environmental sustainability – captures the nature and extent of sustainable business activities that a firm has actually implemented. A firm's ESO as a strategic stance must be manifested through actual conduct or behaviour within the firm. This action-based component indicates that ESO does not only measure the firm's tendency, proclivity or inclination towards environmental sustainability but also the actual behaviour of the firm which provides substantive value to the construct.

The third facet – i.e. appreciation for environmental sustainability – describes the extent to which firms enjoy the tangible benefits of being proactive in fulfilling their ecological responsibility. Firms are likely to sustain their activities demonstrative of their ESO if they have an appreciation of the positive returns of these endeavours in their overall business over the long term. The three facets – which may be aptly called the “3A's” of ESO – synergistically drive the firm's overall strategic stance towards environmental sustainability.

The current study, however, has a number of limitations that point out issues for future investigation. First, the sample size needs to be expanded to include firms of more diverse sizes, such as medium-sized firms, to uncover further variations on the firms' ESO. It is important to examine in future studies the relevance and applicability of the measurement model of ESO on a larger group of SMEs in different sectors, industries and countries. The current study's focus on small firms in The Philippines suggests that the findings may not be necessarily generalisable to SMEs within the country or overseas. Given the international variations in classifying firms according to their size and financial capacity, firms classified as small in The Philippines may be categorised differently in other countries. Hence, the findings of the current study may not necessarily represent the financial position and ESO of firms that are categorised as “small” in other countries. Furthermore, cross-national differences in regulatory and business environments have the potential to cause variations in the ESO of firms regardless of their financial capability. In more developed countries, firms may have higher levels of ESO relative to firms in developing countries like the Philippines due to more stringent environmental regulatory frameworks.

Second, the measurement of ESO did not take into account the extent or magnitude of specific sustainability measures that firms undertake. It also did not take into consideration the extent to which firms undertake these sustainability measures as a matter of compliance or as a demonstration of the firm's proactive stance towards sustainability. It is important therefore to examine other drivers, motivations and enablers of ESO. More importantly, the conceptual definition of ESO as used in this study is limited to issues concerning business activities in relation to the natural environment. The current study recognises that sustainability encompasses not just natural environmental issues but also cultural and social environmental concerns that are beyond the scope of the current study. Finally, future studies

need to examine the potential effects of social desirability bias on the results of studies dealing with sustainability issues in business.

Table I Exploratory factor analysis: ESO items			
<i>Items</i>	<i>Awareness of environmental sustainability issues Loadings</i>	<i>Factors Actions for environmental sustainability Loadings</i>	<i>Appreciation of environmental sustainability Loadings</i>
1. Knowledge about climate change	0.91		
2. Waste management issues in the city	0.89		
3. Issues about sources of drinking water	0.90		
4. Issues concerning source of electricity	0.79		
5. Role of businesses in environmental protection	0.85		
6. Environmental protection programs	0.75		
Cronbach's $\alpha = 0.89$			
7. Practice recycling of wastes		0.94	
8. Water and electricity conservation		0.96	
9. Training on environmental awareness		0.89	
10. Participation in environmental programs		0.91	
11. Low impact manufacturing technology		0.89	
12. Communicate with customers/buyers		0.90	
13. Deal with environment-friendly suppliers		0.92	
14. Develop sustainable products or services		0.89	
Cronbach's $\alpha = 0.91$			
15. Environmental protection is part of business			0.91
16. Practices are good for my business			0.90
17. Gain more customers			0.89
18. Proud to do business in local community			0.93
Cronbach's $\alpha = 0.88$			
Eigenvalues	4.95	2.71	1.95
Percentage of variance explained	42.25	15.72	9.52
Cumulative percentage	42.25	57.97	67.49
Iterations	9		
KMO	0.89		
Bartlett's test of sphericity, χ^2 (df = 135, $p < 0.05$)	3,585.29		

Table I Exploratory factor analysis: ESO items

Table II Exploratory factor analysis: financial resources items	
<i>Financial resources items</i>	<i>Loadings</i>
1. Adequate financial resources	0.97
2. No difficulty gaining access to credit and loans	0.96
3. Always has positive cash flows	0.80
4. Raise the funds to support expansion plans	0.85
5. Financial resources to train employees	0.89
6. Financial resource to buy new machinery	0.92
7. Financial resource for environmental programs	0.93
Cronbach's $\alpha = 0.92$	
Eigenvalues	3.52
Percentage of variance explained	75.29
Iterations	5
KMO	0.91
Bartlett's test of sphericity, χ^2 (df = 0.48, $p < 0.05$)	562.35

Table II Exploratory factor analysis: financial resources items

Table III Construct correlation and descriptive statistics

Constructs and variables	Mean	SD	AW	ACT	APP	FIN	SIZE	AGE	ADV
Awareness (AW)	5.91	1.57	1						
Action (ACT)	5.51	1.56	0.79*	1					
Appreciation (APP)	5.62	1.53	0.81*	0.78*	1				
Financial resources (FIN)	3.86	1.92	0.12*	0.13*	0.08	1			
Firm size (SIZE)	17.95	13.47	0.08	0.09	0.10	0.19*	1		
Firm age (AGE)	14.10	11.16	0.11*	0.14*	0.12*	0.09	0.14	1	
Advertising budget (ADV)	2.56	1.14	0.05	0.09	0.11	0.54*	0.45	0.18	1

Notes: SD, standard deviation; * $p < 0.05$

Table III Construct correlation and descriptive statistics**Table IV** Multiple regression models

Independent variables	Dependent variables: three facets of ESO					
	Awareness β (SE)		Actions β (SE)		Appreciation β (SE)	
	OLS	Robust	OLS	Robust	OLS	Robust
Constant	3.34* (0.56)	3.35* (0.61)	3.50* (0.55)	3.49* (0.60)	3.43* (0.54)	3.42* (0.55)
Financial resources	0.04 (0.08)	0.05 (0.08)	0.07 (0.08)	0.08 (0.08)	0.07 (0.07)	0.06 (0.07)
Firm size	0.02 (0.01)	0.01 (0.01)	0.06 (0.01)	0.08 (0.01)	0.09 (0.01)	0.10 (0.02)
Firm age	0.11* (0.08)	0.12* (0.07)	0.13* (0.09)	0.13* (0.08)	0.11* (0.08)	0.10* (0.09)
Advertising budget	0.06 (0.11)	0.07 (0.10)	0.10 (0.12)	0.09 (0.10)	0.09 (0.07)	0.07 (0.09)
r^2	0.08		0.09		0.09	
Durbin-Watson	1.26		1.29		1.23	
F values	2.59*		2.56*		2.79*	

Notes: β , standardised beta coefficient; SE, standard error; * $p < 0.05$

Table IV Multiple regression models

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Appendix: Survey questions

A. ESO items:

- We (i.e. managers/and or employees) have adequate knowledge about climate change and global warming.
- We are aware of the solid and liquid waste management problems in the city.
- We are aware of the problems about the city's sources of drinking water.
- We are aware of the problems about the city's source of electricity.
- We know that businesses have an important role to play in environmental protection.
- We know that there are environmental protection programs organised by the government, business sector, and non-government organisations in the city.
- Recycling of production wastes is a normal practice in our business.
- We are taking action to conserve water and electricity in our business.
- Training of employees includes environmental awareness.
- We participate in voluntary environmental programs.
- We invest in manufacturing technology or machineries that have low impact on the natural environment.
- We communicate with our customers/buyers about environmental issues.

- We deal only with suppliers and/or distributors with environment-friendly business practices.
- We develop products and/or services with the corresponding natural environmental impact in mind.
- We believe that protection of the natural environment is part of our business.
- We know that environment-friendly manufacturing practices are good for my business.
- The business gains more customers as a result of being an environment-friendly business.
- We are proud to do business in our local community because of our environment-friendly manufacturing practices.

B. Financial resources:Our firm ...

- ... has adequate financial resources to support our business activities.
- ... has no difficulty in gaining access to credit and loans from banks and other financial institutions.
- ... has positive cash flows.
- ... can easily raise funds to support plans for expansion of our production capacity.
- ... has adequate financial resources to support further training and development of employees.
- ... has adequate financial resource to develop or buy new production machinery, equipment or tools when needed.
- ... has excess financial resource to support environmental protection programs.

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