Journal of Cleaner Production 42 (2013) 69–82

Contents lists available at SciVerse ScienceDirect

Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro

Making the case for operating "Green": impact of environmental proactivity on multiple performance outcomes of Malaysian firms

Murali Sambasivan [a,*], Saiku M. Bah [b], Ho Jo-Ann [c]

[a] Global Entrepreneurship Research and Innovation Center, Universiti Malaysia Kelantan, 62050 Putra Jaya, Malaysia
[b] Graduate School of Management, Universiti Putra Malaysia, 43400 UPM, Malaysia
[c] Faculty of Economics and Management, Universiti Putra Malaysia, 43400 UPM, Malaysia

ARTICLE INFO

Article history:
Received 25 June 2012
Received in revised form
7 November 2012
Accepted 15 November 2012
Available online 28 November 2012

Keywords:
Environmental proactivity
Environmental performance
Operational performance
Stakeholder satisfaction
Financial performance
Malaysia

ABSTRACT

In spite of the significant amount of work that has been conducted to investigate the impact of environmental proactivity on firm financial performance, limited research has focused on other firm performance outcomes such as operational performance and stakeholder satisfaction. The roles played by interacting and mediating constructs have not been addressed adequately in the environmental proactivity/firm performance literature. Drawing on stakeholder theory and the resource-based view of the firm, this study on 291 firms in Malaysia has hypothesized that environmental proactivity is positively related to (1) operational performance, (2) organizational learning, (3) environmental performance, (4) stakeholder satisfaction and (5) financial performance. The study has also hypothesized that the types of technologies deployed to address environmental issues moderates the relationship between environmental proactivity and operational performance, whilst environmental performance mediates the relationship between environmental proactivity and stakeholder satisfaction, which in turn mediates the relationship between environmental proactivity and financial performance. Using structural equation modeling (SEM) for the data analysis, findings indicate that environmental proactivity is positively related to operational performance, organizational learning, environmental performance, stakeholder satisfaction and financial performance. Significantly, the mediating role of stakeholder satisfaction is also supported by the data even though the mediating role of environmental performance and the moderating role of types of technologies are not supported by findings.

1. Introduction

It is increasingly becoming difficult to ignore the high toll human activity is inflicting on the natural environment. Individuals, governments and even business organizations, which have emerged to be very powerful in the world and whose activities can be argued to be responsible for the greatest percentage of direct damage to the natural environment can no longer just sit by and do nothing (Hutchinson, 1996; Lindsey, 2011; Lozano, 2008). Based on the current trends, it is not difficult to realize that business organizations and other stakeholders are still struggling to identify an economic model, which incorporates the natural environment and is still suitable for businesses (Aragón-Correa et al., 2008; Christmann, 2000; Sangwan, 2011). The conventional wisdom which holds that investing in environmental management practices increases operational costs (Palmer et al., 1995; Walley and Whitehead, 1994) with little or no financial benefits to the organization still persists (Ambec and Lanoie, 2008). Some empirical studies also seem to indicate that going green does not bring added advantage to a firm (Aragón-Correa and Rubio-López, 2007; Gilley et al., 2000; Link and Naveh, 2006; Wagner, 2005). This school of thought explains the ambivalence toward and sometimes, outright resistance to international as well as national efforts to cap toxic emissions. Despite several arguments for and against, there seems to a consensus among researchers and practitioners that a more sustainable society (developed or developing or under-developed) is in the best interest of current generation and future generations of people to come (Dyllick and Hockerts, 2002; Lindsey, 2011; Lozano, 2008).

Empirical research linking environmental proactivity and business performance outcomes have been largely inconclusive (Gonzalez-Benito and Gonzalez-Benito, 2005). Some researchers argue that implementing proactive measures can be expensive and unrealistic to many firms (Walley and Whitehead, 1994; Newton and Harte, 1997). In the last two decades an increasing number of scholars have postulated a new paradigm which basically argues that going green makes good business sense (Ambec and Lanoie, 2008; Elkington, 1994; Hutchinson, 1996; Orsato, 2006; Porter

* Corresponding author. Tel.: +60 3 88902253.
E-mail address: sambasivan@hotmail.com (M. Sambasivan).

0959-6526/$ – see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.jclepro.2012.11.016

and van der Linde, 1995a) though research findings in the field have so far been mixed (Aragón-Correa et al., 2008; Christmann, 2000). A large amount of empirical research seems to suggest that going green is good for business at least financially (Ann et al., 2006; Claver et al., 2007; Lee, 2005; Molina-Azorín et al., 2009; Wagner, 2007). Even though the majority of studies have reported a positive impact of environmental performance on firm financial performance (Aragón-Correa et al., 2008), the lack of consensus means the debate is still not over. More research on the impact of environmental proactivity on firm performance is needed to help provide a solid foundation that will guide industry practitioners on how to achieve a triple bottom line (operational, environmental and financial performances) (Dyllick and Hockerts, 2002; Elkington, 1994) or at the very least make environmental proactivity less of a burden to firms. Gonzalez-Benito and Gonzalez-Benito (2005) have argued the roles of environmental proactivity as a source of (1) strategic resources and capabilities, (2) cost and differentiation competitive advantage and (3) new business opportunities. In this research, we have considered several dimensions of firm performance (environmental performance, operational performance, organizational learning, stakeholder satisfaction and financial performance).

Environmental proactivity, in this study, refers to voluntary actions beyond compliance that a firm undertakes to minimize or eliminate the negative impact of its activities and/or products on the natural environment (Menguc and Ozanne, 2005). These actions include policy planning, employee training, investments in environmental technologies (Shrivastava, 1995); introduction of green products and life cycle analysis in product design, implementing environmental management systems, enforcing environmental criteria for suppliers and distributors, obtaining environmental certifications as well as efforts to protect natural habitats and restoration measures of affected habitats (Menguc and Ozanne, 2005). In other words, environmental proactivity refers to the firm's actions to limit both upstream and downstream negative impacts on the natural environment. Environmental proactivity, in general, refers to a "process" rather than an "outcome" (Gonzalez-Benito and Gonzalez-Benito, 2005).

In spite of the significant amount of work that has been conducted to investigate the impact of environmental proactivity on firm financial performance and operational performance (Casadesus-Masanell et al., 2009; Gonzalez-Benito and Gonzalez-Benito, 2005; King and Lenox, 2002), we observe that limited research has focused on other firm performance outcomes such as environmental performance, organizational learning and stakeholder satisfaction. A number of researchers have called for interacting and intervening variables to be factored in while studying the influence of environmental proactivity on firm performance (Aragón-Correa and Sharma, 2003; Wagner et al., 2001). To respond to the call made by these researchers, we have also investigated the mediating effects of environmental performance and stakeholder satisfaction. The moderating effect of type of technologies between environmental proactivity and operational performance has been examined.

The contributions of this study are fourfold. First, the multiple performance outcome approach used in this study draws attention to the fact that environmental proactivity may be significantly associated with a range of firm performance indicators like operational performance, environmental performance, financial performance, organizational learning and stakeholder satisfaction, which taken together provides researchers with a holistic approach of investigating the impact of investing in environmental proactivity. Second, the relationship between environmental proactivity and financial performance has received considerable attention but the mechanism(s) of the relationship have not been addressed adequately. In this study, we argue that environmental performance and stakeholder satisfaction are the mediating constructs that explain this relationship. Earlier studies have mainly focused the direct relationship between environmental proactivity and financial performance (Ambec and Lanoie, 2008; Casadesus-Masanell et al., 2009). Third, this study has recognized the role of technologies (prevention and control) in improving operational performance by interacting with proactive measures. Many researchers have argued and empirically tested the direct effect of technologies (Christmann, 2000; Klassen and Whybark, 1999; Porter and van der Linde, 1995a). In this research, we have explicitly tested the moderating role of technologies. Fourth, most of the studies related to environmental proactivity have been conducted in developed countries where the firms have more resources to implement proactive systems and technologies. This is one of the very few studies conducted in a developing country like Malaysia. Malaysia has been chosen as the area of study for the following reasons: (1) it is one of the fastest growing economies in the South-East Asia with very rich natural resources (about 60% of the land area is forest); (2) It ranks 25th in the world on Environmental Performance Index (EPI); (3) It is moving toward achieving the developed country status by 2020; (4) Rapid industrialization and urbanization, typical of developing countries, have put tremendous pressure on the environmental health of Malaysia and in spite of these pressures the country has been doing well on the environmental front; (5) Malaysia has a well drafted environmental policy and one of the major emphasis of this draft is on taking proactive measures by firms to reduce environmental damage. More than 600 companies in Malaysia have ISO 14001 certification. The lessons learned from this study can benefit developing countries and the governments can formulate strong policies in favor of being environmentally proactive.

2. Theoretical framework and hypotheses development

The theoretical framework for this research has been drawn using the theories of RBV (Resource Based View) (Barney, 1991; Grant, 1991) and Stakeholder satisfaction (Freeman, 1984, 2004). According to Gonzalez-Benito and Gonzalez-Benito (2005: p. 8), "most of the arguments that are used to explain the existence of advantages associated with environmental proactivity are based on the RBV of the firm". They have explained the effect of environmental proactivity on business performance (operational performance, financial performance and marketing performance) through three distinct resources: (1) physical assets and technology, (2) human resources and organizational capabilities and (3) intangible resources. Recognizing that resources by themselves are not sufficient to create competitive advantage, a firm's specific ability to utilize these resources to its own advantage (Amit and Schoemaker, 1993) becomes very important. Hence, in applying the resource-based view we follow the lead of Russo and Fouts (1997) in not only considering the possession of the bundle of resources that engaging in environmental proactivity may bring to a firm but also the development of the required capability to convert them into an advantage to the firm. The advantage can be in the form of improved operational performance, environmental performance, organizational learning and financial performance.

According to Freeman (2004), stakeholders are those groups that are vital to the survival and success of a firm. Based on the Stakeholder Theory, perspectives of the stakeholders have to be taken into consideration in the management of firms. The main groups of stakeholders are the customers, employees, local communities, suppliers, distributors, and shareholders. According to the Stakeholder Theory, the main task of the stakeholder management process is to manage and integrate the relationships and interests of groups of stakeholders in such a way that will satisfy the

different groups (Freeman, 1984, 2004). Stakeholder satisfaction is a key to a firm's success and survival. Berrone, Surroca and Tribo (2007), through the instrumental approach of Stakeholder Theory, have argued that stakeholder satisfaction results in better financial performance.

RBV and Stakeholder Theory put together, offer a useful platform for investigating and explaining how environmental proactivity affects the performance of a firm. These theories not only recognize the significance of intangible resources such as firm reputation and employee experience but also allows for the investigation of how intangible resources like stakeholder satisfaction may be important for the bottom line of a firm (Russo and Fouts, 1997). They also offer a way of explaining how environmental proactivity can help a firm generate organizational wide advantages that could enhance the firm's competitiveness. The framework is given in Fig. 1.

2.1. Environmental proactivity and operational performance

Any strategy that may alter production methods is expected to impact heavily on operational performance that is defined as the degree of effectiveness of the production and operations system of a firm measured by cost, quality, speed and flexibility of the system in producing goods and/or services (González-Benito and González-Benito, 2005). As a firm engages in environmental proactivity and tries to reduce the negative impact of its activities on the environment, the existing methods of material acquisition, production and delivery of goods or services may have to be redesigned (Christmann, 2000; Hart, 1995; Klassen and Whybark, 1999; Russo and Fouts, 1997). Sometimes major investments in new environmental technologies may have to be made to meet the increasing demand to reduce pollution (Hart, 1995; Hart and Ahuja, 1996; Klassen and Whybark, 1999; Shrivastava, 1995). Consequently, redesigned goods or services production system is expected to improve operational performance. The process of redesigning the system can help expose previously unrecognized inefficiencies, reduce cycle and down times, improve energy efficiency and at the same time lead to process and/or product innovations (Montabon et al., 2007; Melynk, Sroufe and Calantone, 2003; Porter and van der Linde, 1995a; Sharma and Vredenburg, 1998). A few researchers have strongly argued that there is a positive relationship between environmental proactivity and operational performance (González-Benito and González-Benito, 2005; Klassen and Whybark, 1999; Porter and van der Linde, 1995a). To be sustainable it is important for firms to design, develop and implement better systems that reduce wastefulness through improved quality of products, systems and processes (Lindsey, 2011). Based on the above arguments, we posit the following hypothesis:

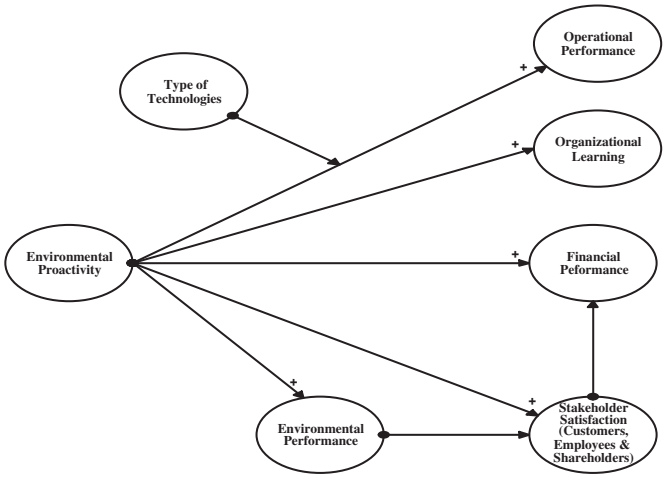

Fig. 1. Conceptual framework.

H1. A firm's environmental proactivity is positively related to its operational performance.

2.2. Environmental proactivity and organizational learning

There is a considerable amount of literature dealing with different aspects of organizational learning within organizational theory but in this paper only those aspects of organizational learning that are perceived to have been primarily driven by a firm's environmental proactivity are considered. Organizational learning is the development of new meaning (Fiol, 1994) that leads to new ways of doing things, with a view to improve future performance (Fiol and Lyles, 1985). According to Schutlz (2002), basic organizational learning model is that organizations collect experiences, draw inferences, and encode inferences in repositories of organizational knowledge, such as formal rules and informal practices. These rules and practices combine current experiences and lessons learned in the past. A more recent approach to organizational learning emphasizes "routines as repositories of knowledge and conceptualizes learning as making and updating routines in response to experiences" (Schutlz, 2002: p. 415). These routines include organizational rules, roles, conventions, strategies, structures, technologies, cultural practices and capabilities.

As a firm continues with its environmental proactivity measures, employees including managers are exposed to a host of internal and external factors that trigger shared learning (Sharma and Vredenburg, 1998). This shared learning makes the firm smarter on how to manage natural environmental issues (Porter and van der Linde, 1995a). When processes are redesigned and new technologies are deployed, additional set of skills and knowledge may have to be developed to manage the new system because organizational learning as a concept involves employee training and coaching as well as everyday practices. It is understood that, the more the procedures of the new system are practiced the more will environmental issues be incorporated into everyday firm activities (Judge and Douglas, 1998). Similarly, the more new procedures are practiced the more experience will be gained leading to a more knowledgeable work force (Link and Naveh, 2006) that is better prepared to manage environmental issues. The whole process of developing a proactive environmental strategy helps create within the firm, skill-based resources and capabilities (Russo and Fouts, 1997) such as new internal routines and know-how (Claver et al., 2007) that facilitates the exploration of new technologies or novel ways of doing things. These resources are usually tacit and socially complex (Barney, 1991) and possession of which, enhances a firm's competitiveness.

Some of the advantages reported for implementing environmental management systems such as ISO 14001 are increased communication between employees and higher levels of R&D (Lee, 2005) and the ability for higher-order learning is one of the capabilities possessed by the environmentally proactive firms (Sharma and Vredenburg, 1998). Based on the above arguments we hypothesize as follows:

H2. A firm's environmental proactivity is positively related to organizational learning.

2.3. Environmental proactivity and environmental performance

Much research has been done on the impact of environmental proactivity on firm performance outcomes. To the knowledge of the authors, only a few studies have been carried out to determine the

impact of environmental proactivity on environmental performance itself (Klassen and McLaughlin, 1996). The implied assumption is that environmental proactivity invariably leads to improved environmental performance. However, some scholars are of the opinion that some indicators of environmental performance such as ISO 14001 certification does not necessarily translate to good environmental performance (Aragón-Correa and Rubio-López, 2007; Johnstone and Labonne, 2008). Environmental performance is defined in this study as the extent to which firm processes and practices maximize efficient use of resources, reduce wastage and environmental risks (Roberts and Gehrke, 1996). Concisely, it is a measure of how successful a firm is in reducing its negative impact on the natural environment (Klassen and McLaughlin, 1996).

Previous studies have argued the benefits of environmental proactivity on environmental performance using two methods: (1) cleaner production technologies (Christmann, 2000; Shrivastava, 1995). According to United Nations Environment Program, "cleaner production is the continuous application of an integrated preventive environmental strategy to processes, products and services to increase efficiency and reduce risks to humans and the environment" (Clean Production Action, 2012) and (2) designing environmentally friendly products (Shrivastava, 1995) and by using tools such as Life Cycle Analysis (LCA). LCA is a "method of evaluation used to assess the environmental impact of technologies from cradle to grave and may be performed on both products and processes" (Huntzinger and Eatmon, 2009: p. 668). These benefits include reduction of waste, reduction of the discharge of harmful substances, higher safety, less consumption of water, energy and other raw materials. Hence, as a firm realigns its strategy and processes to become environmentally proactive, resources and capabilities develop that leads to improved environmental performance. Lopez-Gamero et al. (2009) have established a positive relationship between proactive environmental management and environmental performance. Based on the above arguments, we hypothesize as follows:

H3. A firm's environmental proactivity is positively related to its environmental performance.

2.4. Environmental proactivity and financial performance

In the last two decades, a large number of conceptual as well as empirical studies have been advanced to link environmental proactivity with improved financial performance (Ambec and Lanoie, 2008; Casadesus-Masanell et al., 2009; Hart, 1995; Hart and Ahuja, 1996; Porter and van der Linde, 1995a,b; Russo and Fouts, 1997). A few case studies (Claver et al., 2007; Lanoie and Tanguay, 2000) have reported a number of gains including financial benefits for firms that invest in environmental proactivity. A few studies report otherwise (Walley and Whitehead, 1994; Newton and Harte, 1997). These authors have argued that there is no significant relationship between environmental proactivity and financial performance. In summary, therefore, environmental proactivity can help a firm develop those unique resources and capabilities that can increase its competitive edge and lead to profitability. The above arguments lead to the fourth hypothesis:

H4. A firm's environmental proactivity is positively related to its financial performance.

2.5. Environmental proactivity and stakeholder satisfaction

The desire to satisfy stakeholders (e.g. media, NGOs, host communities, partners, customers, shareholders, employees, regulators) has been identified as one of the major reasons for a firm to implement environmental proactivity measures (Gilley et al., 2000). However, research to examine how stakeholders are influenced by a firm's environmental proactivity has been limited which is surprising because stakeholders are so important to the existence and success of a firm. It would be a strategic failure if the actions of a firm fail to impress them. According to Gonzalez-Benito and Gonzalez-Benito (2005), environmental proactive practices carried out by firms, among other performance measures, tend to enhance image and reputation of the firms and these lead to stakeholder (especially, customers) satisfaction. Therefore, it is important for firms to not only implement proactive measures but also communicate them effectively to the various stakeholders. Based on the Stakeholder Theory, stakeholder satisfaction refers to the extent to which stakeholders manifest their approval of or happiness with a firm because of its environmental proactivity. It is the degree to which the firm's actions concerning the natural environment have met stakeholders' claims (Berrone et al., 2007). Since stakeholders may represent diverse interests, the expected impact of environmental proactivity on the stakeholders can be varied. For example, (1) investors may be concerned with the risks associated with a firm's poor environmental performance (Hamilton, 1995) and may tend to shy away from such firms. On the other hand, when environmental risks such as fines, cleanup costs and law suits are reduced, the firm can become more attractive to current and interested shareholders (Hamilton, 1995; Sambasivan and Fei, 2008; Sharma and Vredenburg, 1998) and (2) among the reported benefits that firms get for going green are higher employee morale, greater involvement with the firm, higher commitment, higher attraction and lower turnover rates (Cordeiro and Sarkis, 1997; Sambasivan and Fei, 2008; Wagner, 2007). In line with the RBV and Stakeholder Theory, it follows that organizational policies that go beyond mere compliance helps a firm exert influence on its image (Orsato, 2006) and gain approval from diverse stakeholders; a rare and non-substitutable resource and capability that improves the competitive position of the firm. This leads to the next hypothesis:

H5. A firm's environmental proactivity is positively related to stakeholder satisfaction.

2.6. Stakeholder satisfaction and financial performance

For a firm to increase sales or its market share, its customers have to be satisfied; to reduce turnover, increase morale, increase commitment and other citizenship behaviors, employees must be satisfied; and to attract and maintain investors, shareholders must be satisfied (Miles and Coven, 2000; Russo and Fouts, 1997; Sharma and Vredenburg, 1998). The instrumental approach to Stakeholder Theory suggests that since the stakeholders have a stake in the firm and control key resources, it is important that they are satisfied for long-term survival and success of a firm. Stakeholder satisfaction is a source of competitive advantage that in turn can result in better financial performance (Freeman, 1984; Berrone et al., 2007). It has been reported that improvements in a firm's image because of better relations with stakeholders including customers, shareholders and employees could result in positive financial performance (Berrone et al., 2007). Based on the above arguments, we hypothesize as follows:

H6. Stakeholder satisfaction is positively related to financial performance of a firm.

2.7. The moderating role of type of technologies between environmental proactivity and operational performance

Type of technologies refers to the technologies specifically deployed to help a firm mitigate its negative impact on the natural environment and can be classified into pollution prevention and

pollution control technologies depending on how they are used to trim down pollution (Christmann, 2000). Pollution control technologies are end-of-pipe technologies that capture, store, treat and dispose of pollutants and wastes and are usually implemented by adding extra equipment at the end of those required for normal production process and do not require the redesign of existing processes (Christmann, 2000; Hart, 1995; Hart and Ahuja, 1996; Klassen and Whybark, 1999; Russo and Fouts, 1997; Shrivastava, 1995). Since, pollution control technologies do not require modification of processes, existing bottlenecks may not be discovered and therefore no improvements in operational performance may be realized by investing in pollution control technologies. Implementation of pollution prevention technologies on the other hand requires modification of firm processes (Christmann, 2000), which can lead to the identification and removal of production constraints during the modification process. The addition of new technology within the production process can also enhance efficiency (Porter and van der Linde, 1995a) and therefore improve overall operational performance. Therefore, we hypothesize as follows:

H7. The type of technologies deployed to achieve environmental proactivity moderates the relationship between a firm's environmental proactivity and its operational performance; in that, pollution prevention technologies enhance operational performance whilst pollution control ones do not.

2.8. The mediating role of environmental performance between proactivity and stakeholder satisfaction

It is only logical to expect that tangible progress be made in terms of environmental performance before environmental proactivity leads to stakeholder satisfaction. In other words, improvements in environmental performance like reduction in toxic emissions and waste generations must be real and mere posturing may not be enough. This is because the public is known to be quick to disgrace firms that make dubious claims (Fryxell and Vryza, 1998) and particularly so for high profile firms which are more likely to incur huge political and economic costs (Al-Tuwaijri et al., 2004). Eventually, any goodwill that may have been enjoyed by false claims of improved environmental performance could erode and be replaced by general mistrust. Therefore, any stakeholder satisfaction gained because of environmental proactivity hinge on credible improvements in environmental performance. Based on the above arguments, we hypothesize as follows:

H8. A firm's environmental performance mediates the relationship between its environmental proactivity and stakeholder satisfaction.

2.9. The mediating role of stakeholder satisfaction between proactivity and financial performance

RBV states that in order for firms to realize a sustainable competitive advantage its resources and capabilities must be unique and non-substitutable (Amit and Schoemaker, 1993; Barney, 1991; Grant, 1991). Stakeholder theory suggests that unless a firm can leverage its environmental proactivity to generate competitive advantage it may not realize profits from its proactive measures since environmental proactivity on its own does not create benefit for a firm (Berrone et al., 2007). How then can firms gain financial advantage from going green? The answer to that lies partly in the fact that empirical evidence from past research seems to suggest that organizational capabilities mediate the association between environmental proactivity and financial performance (Aragón-Correa et al., 2008). Strangely, the specific role of stakeholder satisfaction, a construct that may explain the mechanism through which firms may derive benefits from going green has received little or no attention. This is surprising in the sense that most of the financial gains that have been attributed to environmental proactivity are a direct reflection of how successful a firm has been in its bid to meet the satisfaction of its stakeholders such as customers, employees and shareholders. The factor that could help firms realize financial gains from their environmental proactivity could depend on how much they have succeeded in satisfying their stakeholders. Based on the above arguments the following hypothesis is posited:

H9. Stakeholder satisfaction mediates the relationship between a firm's environmental proactivity and its financial performance.

3. Material and methods

The epistemological root of our study is empiricism. It is the foundation of positivism and views reality as universal, objective and quantifiable (Darlaston-Jones, 2007). Since our study involves (1) validating a framework that is built based on the relationships between various constructs and (2) generalizing the results, empiricism is the most pragmatic approach. Empiricism is the scientific method that emphasizes on testing theories and hypotheses against observations (Van Fraassen, 2002). The survey method of collecting data was used because independently verifiable data on environmental proactivity was not readily available for Malaysian companies (Sumiani et al., 2007). The use of self-reported measures in the environmental proactivity firm performance literature is well-established (Wagner, 2007; Melnyk et al., 2003; Christmann, 2000; Klassen and Whybark, 1999; Sharma and Vredenburg, 1998) when other sources of reliable data may not be available.

In this study, we initially focused on three primary stakeholder groups (Clarkson, 1995): employees, shareholders and customers. These three stakeholder groups are referred to as dominant stakeholders (Mitchell et al., 1997) because they possess two relational attributes (power and legitimacy) with firms when it comes to environmental issues. Additionally, past research seems to indicate that firms usually give attention to this three core stakeholders (Garcia de Madariaga and Valor, 2007; Jamali, 2008; Kassinis and Vafeas, 2006; Knox et al., 2005; Ruf et al., 1998). Many firms that we contacted refused to divulge information about the customer base and therefore, we distributed two sets questionnaire to each firm: one addressed to the top management and the other addressed to five employees within the firm. Additionally, the pretests have showed that organizations do have a good idea about the impact of their firm's action on customers as well as shareholders and therefore useful information can be obtained from managers through a carefully designed survey instrument that can gauge the impact of proactivity on stakeholder satisfaction.

The sample firms for this research were obtained from the Capital IQ database. This database is owned by Standard & Poor and is a rich source of information (financial and non-financial) about companies all over the world. The information provided by the database includes quantitative and qualitative data. This database is used by many researchers in the top universities and other research agencies. Screening criteria for extracting the sample firms included: (1) number of employees ($\geq$150). This is based on the suggestion given by Aragon-Correa et al. (2008) and Sharma and Vredenburg (1998) that larger firms tend to be more proactive; (2) geographic location (Malaysia), and (3) industry types relevant to Malaysia—15 industry types ranging from agriculture to sewage disposal and the sample included both the manufacturing and services sectors. The screening returned a list of 988 firms. The questionnaires were distributed to all the 988 firms. Of these, 291 Malaysian firms responded (response rate – 30%) with the

completed questionnaires and only 20% came from the service industry. The top three industries represented in the sample were: Forest products (38%), electronics (22%) and chemicals (18%). The average age of the firms was 32 years. The minimum firm size in terms of number of employees was 200 and maximum was 100,000 with an average of 3091. A copy of the questionnaire is given in the Appendix.

3.1. Measures

3.1.1. Environmental proactivity

Recognizing that environmental proactivity is a multidimensional construct, a large number of items drawn from previous literature (Aragón-Correa et al., 2008; González-Benito and González-Benito, 2005; Montabon et al., 2007; Melnyk et al., 2003; Sharma and Vredenburg, 1998) were used to measure both upstream and downstream environmental practices. Nineteen items were used to measure the construct wherein respondents were asked to indicate the extent to which their firms have implemented certain actions using a scale which ranged from 1 = never implemented to 7 = always implemented. Items include "long term environmental plans and targets" and "selection of cleaner transportation methods. The reliability for this scale measured with Cronbach's Alpha was 0.97. Table 1 gives the meaning of statistical terms used in this research.

3.1.2. Operational performance

The section on operational performance asked respondents to indicate the impact of environmental proactivity on operational performance and contained seven items that asked about "reduction in operational costs" and "product quality" (González-Benito and González-Benito, 2005; Melnyk et al., 2003). The scale provided ranged from 1 = much worse to 7 much improved. The reliability for this scale measured with Cronbach's Alpha was 0.90.

3.1.3. Type of technologies

Five questions, that asked about the type of technologies the firm was using to reduce its negative impact on the environment (Christmann, 2000), were used to measure this construct. The scale provided ranged from never used = 1 or always used = 7. The reliability for this scale measured with Cronbach's Alpha was 0.62.

3.1.4. Environmental performance

This construct was measured with 10 items, which asked respondents the extent to which environmental proactivity has improved/worsened indicators such as "energy use", "carbon footprint" and "overall reduction in pollution" (Judge and Douglas, 1998; Menguc and Ozanne, 2005; Roberts and Gehrke, 1996). The scale provided ranged from 1 = much worse to 7 = much improved. The reliability for this scale measured with Cronbach's Alpha was 0.92.

3.1.5. Organizational learning

This construct was measured with five indicators, which included items such as "the knowledge base on natural environmental issues" and "innovative culture" (Sharma and Vredenburg, 1998). The scale provided here ranged from 1 = greatly decreased to 7 = greatly increased. The reliability for this scale measured with Cronbach's Alpha was 0.80.

3.1.6. Financial Performance

The financial performance measure in our study was obtained by asking respondents to assess how environmental proactivity had impacted financial performance in the form of cost reductions. This method allowed for the direct evaluation of how much environmental proactivity had been beneficial to the firm financially and it is an approach that had been used in the past to evaluate financial performance in the environmental proactivity literature (Judge and Douglas, 1998). Four items that basically measured cost reductions as a proxy for financial performance were used and the scale provided was reverse coded with 1 = greatly increased and 7 = greatly decreased. The reverse coding was necessary because the section asked respondents to assess the impact of environmental proactivity on measures of cost reductions such as "cost of energy" and "cost of developing new projects" (Ambec and Lanoie, 2008) wherein the largest reduction is regarded as the best. The reliability for this scale measured with Cronbach's Alpha was 0.81.

3.1.7. Stakeholder satisfaction

In the management questionnaire, nine items were used to measure stakeholder satisfaction. Mindful of biases such as the feel good effect or social desirability, two sections were designed to proxy for the effect of environmental proactivity on shareholders and customers in the management questionnaire. One section asked for an assessment of the impact of environmental proactivity on stakeholders in general whilst the next section asked respondents to evaluate how they would respond to the environmental proactivity of firms other than theirs that they deal with. This approach allowed for a pragmatic evaluation by respondents on how stakeholders and customers would react to the environmental proactivity of a firm. Items in the section include "increased customer satisfaction" and "willingness to pay more for products/services" (Berrone et al., 2007; Casadesus-Masanell et al., 2009; Cordero and Sarkis, 1997; Kassinis and Vafeas, 2006; Sharma and Vredenburg, 1998; Wagner, 2007). Respondents were asked to indicate how much they agreed or disagreed with the statements using a scale that ranged from 1 = strongly disagree to 7 = strongly agree. The employee questionnaires contained seven items that proxy employee satisfaction. Items include "employee identification with the company", and "employee satisfaction" and carried the same scale as that of the stakeholder satisfaction section in the management questionnaire. There were also questions that captured demographic data such as age, gender and duration of employment. Since the data analysis is at the organizational level, employee responses for each company were aggregated before they were used for further analysis. The reliability for the aggregated scale measured with Cronbach's Alpha was 0.91.

Past studies (González-Benito and González-Benito, 2005; Link and Naveh, 2006; Russo and Fouts, 1997; Wagner, 2007) have shown that factors such firm size affect the outcome of some of the constructs that are being considered in this study. Thus two control variables (firm size and age of firm were included in the framework in order to test for their effects on the previously hypothesized relationships.

4. Results and analysis

4.1. Preliminary analysis

The preliminary data examination process involved data screening, sorting, filtering and cleaning. The data did not reveal any major issues with outliers and missing values as only 0.02% of the data was missing. Little's MCAR test (p-value = 0.53) indicated that the data is missing completely at random (MCAR). Table 1 gives the definition of MCAR. Non-response bias was tested through independent-samples t-test for all variables between the first and last waves of respondents. This test is carried out when the response rate is less than 30% (Armstrong and Overton, 1977). The test indicated that there was no significant difference between early and late respondents in terms of response behavior suggesting that there was no evidence of non-response bias.

Table 1
List of statistical terms used and their meaning.

Serial number	Term	Meaning/definition/expansion of terms	Threshold value, if applicable
1	Reliability	An assessment of the degree of consistency between multiple measurements of a variable (p. 137). It measures the extent to which a variable or a set of variables is consistent in what it is intended to measure. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. A "high" value of alpha is often used as evidence that the items measure an underlying (or latent) construct.	$\geq$0.7 (0.6 can be accepted)
2	MCAR (Missing cases at random)	Classification of missing data applicable when missing values of dependent variable are not dependent on independent variables. When missing data are MCAR, observed values of dependent variable are a truly random sample of all values of dependent variable, with no underlying process that lends bias to the observed data (p. 40).	Significance *p*-value for the Little's test must be $>$ 0.05
3	Df[a]	Degrees of freedom	–
4	RMSEA[a]	Root mean square error approximation	$\leq$0.08
5	CFI[a]	Comparative Fit Index	$\geq$0.90
6	SRMR[a]	Standardized root mean error residual	$\leq$0.08
7	Cluster analysis	Cluster analysis classifies objects such as respondents, products or other entities. Each object in the cluster is similar to others in the cluster based on a set of selected characteristics	
8	SEM	SEM is a family of statistical models that seek to explain the relationships among multiple variables. In doing so, it examines the structure of interrelationships expressed in a series of equations, similar to a series of multiple regression equations. These equations depict all the relationships between the dependent and independent variables involved in the analysis (p. 711).	
9	Validity (construct)	Is the extent to which a set of measured items actually reflects the theoretical latent construct those items are designed to measure. Thus, it deals with the accuracy of measurement.	
10	CR[a]	Construct Reliability – composite reliability is a measure of the overall reliability of a collection of heterogeneous but similar items	$\geq$0.7
11	AVE[a]	Average of variance extracted – measures the amount of variance captured by a construct in relation to the variance due to random measurement error	$\geq$0.5
12	Chi-square, χ^{2a}	Chi-square value indicates how well the hypothesized model fits the data. Conceptually, chi-square value represents the difference between the observed data and the predicted model or data. Many of the fit indices used in SEM are derived from chi-square value. If the sample size is more than 200, other fit indices like RMSEA, SRMR, and CFI are used to assess the model fit (less reliance on chi-square)	Chi-square/df termed as normed chi-square must be below 3.
13	Delta chi-square, $\Delta\chi^{2a}$	Delta chi-square indicates the change in chi-square value between the model with mediation/moderation effect and without mediation/moderation effect. A significant chi-square difference indicates the fit of the more complex model (mediation/moderation model) is significantly better than the simpler one (without mediation/moderation).	
14	Confidence interval	A confidence interval gives an estimated range of values which is likely to include an unknown population parameter, the estimated range being calculated from a given set of sample data	
15	Delta degrees of freedom, Δdf[a]	Delta degrees of freedom indicate the change in degrees of freedom between the model with mediation/moderation effect and without mediation/moderation effect.	
16	*p*-value[a]	In statistical hypothesis testing, the *p*-value is the probability of obtaining a test statistic at least as extreme as the one that was actually observed, assuming that the null hypothesis is true. If *p*-value is lesser than the default significance level of 0.05, the null hypothesis is then rejected.	
17	Sobel's test	The Sobel's test is a specialized test that provides a method to determine whether the reduction in the effect of the independent variable, after including the mediator in the model, is a significant reduction and therefore whether the mediation effect is statistically significant.	

[a] Value comes from SEM output (CR and AVE are computed). Source: Hair et al. (2010); Easton and McColl (1997); Anderson and Gerbing (1988).

4.2. Descriptive statistics

The mean values of each construct and the correlation between each constructs are given in Table 2. The mean values of the constructs indicate that the scores fall between moderate to high values. This implies that Malaysian companies have started to implement environmental proactive measures and these measures have started to show results in some dimensions of performance. While the firms perceive that environmental, operational and financial performances have shown improvements, organizational

Table 2
Construct correlation matrix and descriptive statistics.

	EN	EP	OP	OL	SS	FP	AF[a]	FS[a]
EN	1							
EP	0.444*	1						
OP	0.233*	0.344*	1					
OL	0.213*	0.363	0.034	1				
SS	0.233*	0.129*	−0.117	0.341*	1			
FP	0.202*	0.018	0.154*	0.086	0.356*	1		
AF	0.09	0.069	0.083	0.49	0.02	0.051	1	
FS	0.255*	0.084	−0.051	0.116	0.129	0.109	0.353*	1
Mean	4.26	4.36	4.78	4	11.19	4.64	3.24	7.1
SD	0.19	0.5	0.03	0.18	8.35	0.13	0.64	1.14
CR	0.97	0.94	0.92	0.85	0.98	0.81	–	–
AVE	0.66	0.66	0.65	0.58	0.75	0.52	–	–

Note: * p-value < 0.05; EN = environmental proactivity, OP = operational performance, OL = organizational learning, SS = stakeholder satisfaction, EP = environmental performance, AF = age of firm, FS = firm size and FP = financial performance; CR − Composite Reliability, AVE − Average Variance Extracted.
[a] Control variables.

learning has not. Correlation values indicate that environmental proactivity is significantly correlated with all dimensions of performance and the strongest relationship is between proactivity and environmental performance.

4.3. Hypotheses testing

Structural equation modeling (SEM) was used for hypotheses testing. Table 1 gives an explanation of SEM. The two-step method proposed by Anderson and Gerbing (1988) was followed in specifying and developing both the measurement and structural models so that any significant change in the factor loadings of individual constructs could be detected (Hair et al., 2010; Anderson and Gerbing, 1988) thus reducing the potential for interpretational confounding. Accordingly, the measurement model was first specified and validated (CFA) before the hypothesized structural model validity was tested. All the CFA and SEM analysis were carried out with AMOS™ (version 18) statistical software using maximum likelihood estimation. We tested the construct validity of each construct based on guidelines given by Hair et al. (2010). Specifically, we calculated Composite Reliability (CR) and Average Variance Extracted (AVE) for each construct and these values satisfy the threshold criteria. Table 1 gives the definition and threshold values and Table 2 gives the values of CR and AVE.

The proposed measurement model demonstrated an acceptable level of fit ((χ^2) = 2748.45, (df) = 1864, p-value = 0.000, (RMSEA) = 0.040 with a 90% confidence interval between 0.037 and 0.044, (CFI) = 0.94 and (SRMR) = 0.06). The goodness-of-fit indices indicated above are the minimum number recommended by Hair et al. (2010) and Table 1 gives the expansion of these terms and the acceptable values. However, examination of the parameter estimates revealed that the standardized factor loadings of seven items under various constructs were insignificant and below the recommended 0.5 level. These items were thus deleted consistent with the suggestions of Anderson and Gerbing (1988) and Hair et al. (2010). After the items were removed, the proposed model demonstrated improved fit (χ^2 = 1690.61, df = 1458, p = 0.000, RMSEA = 0.023 with a lower and upper bound 90% confidence interval of 0.018 and 0.028 respectively, CFI = 0.98 and SRMR = 0.04). After an acceptable level of validity was established in the proposed measurement model, the assessment then proceeded to the proposed structural model.

The fit statistics of the proposed structural model suggest good fit as they are all within the range associated with good model fit (χ^2 = 1816.7, df = 1471, p = 0.000, CFI = 0.98, SRMR = 0.08, RMSEA = 0.028 with a 90% confidence interval of 0.024–0.033). The mediation model also demonstrated an acceptable and improved level of fit when compared with the structural model without mediation ($\Delta\chi^2$ = 29.14, Δdf = 2, χ^2 = 1787.56, df = 1469, p-value = 0.000, CFI = 0.98, SRMR = 0.07, RMSEA = 0.027 with a 90% confidence interval of 0.023–0.032). The proposed structural model is given in Fig. 2. The summary of hypotheses testing results are given in Table 3. The mediation effects were tested using the procedure suggested by Baron and Kenny (1986) and Sobel's test.

For the purpose of testing moderation effects, a two-step cluster analysis was performed based on the type of technologies and it yielded two clusters with a very good cluster quality. Table 1 gives an explanation of cluster analysis. The cluster analysis was carried out to determine if the responding companies relied mainly on control or preventive technologies. Cluster one contained 133 (45.7%) of the cases in the sample and consisted of firms that relied mainly on control technologies to reduce the negative impact of their activities on the environment. Cluster two had 158 (54.3%) of the cases and consisted of firms that relied mainly on preventive technologies to reduce the negative impact of their activities on the environment. The moderation effects were tested using multi-group SEM analysis wherein the sample of respondents was divided into two groups (firms relying on preventive technologies and control technologies) based on the theoretical characteristics of the moderating construct (Hair et al., 2010; Baron and Kenny, 1986). The two models used to test moderating effects demonstrated acceptable fit (χ^2 = 3763.73, df = 2939, p-value = 0.000, CFI = 0.9, RMSEA = 0.031 for the unconstrained group model and χ^2 = 3761.25, df = 2938, p-value = 0.000, CFI = 0.94 RMSEA = 0.031 for the constrained group model). The $\Delta\chi^2$ between the models is not significant (p-value = 0.115) and indicates that type of technologies does not moderate the relationship between environmental proactivity and operational performance.

The two control variables, firm size and age of firm were explicitly modeled in order to determine their effects on the proposed structural model (Fletcher et al., 2006). The results obtained showed that relationships between the two control variables and the firm performance outcome constructs in the model were not significant except for that of firm size and operational performance.

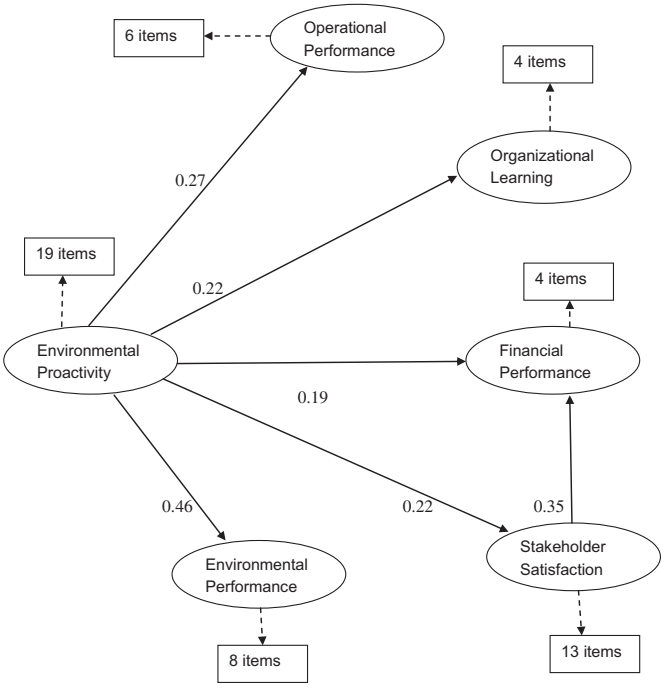

Fig. 2. Proposed framework (with significant parameter estimates).

Table 3
Summary of hypotheses results.

SNo	Hypothesis	Estimate and *p*-value	Conclusion
1	Environmental proactivity and operational performance	0.27, 0.000	Hypothesis supported
2	Environmental proactivity and organizational learning	0.22, 0.000	Hypothesis supported
3	Environmental proactivity and environmental performance	0.46, 0.000	Hypothesis supported
4	Environmental proactivity and financial performance	0.19, 0.006	Hypothesis supported
5	Environmental proactivity and stakeholder satisfaction	0.23, 0.000	Hypothesis supported
6	Stakeholder satisfaction and financial performance	0.35, 0.000	Hypothesis supported
7	Moderating role of type of technologies	Multi-group SEM	Hypothesis not supported
8	Mediating role of environmental performance	0.22 and 0.03, 0.647[a]	Hypothesis not supported
9	Mediating role of stakeholder satisfaction	0.22 and 0.35, 0.006[a]	Hypothesis supported

[a] Values based on Sobel's test for mediation.

5. Discussion of the findings

The findings from this study have made some key contributions to the furtherance of knowledge in this important area of research. Evidence from the results seems to suggest that the relationship between environmental proactivity and firm performance outcomes is much broader than was previously considered in past research. Results from this study seem to suggest that environmental proactivity is positively related to operational performance, organizational learning, environmental performance and stakeholder satisfaction. Compared to previous studies, the multiple performance outcome approach used in this study draws attention to the fact that environmental proactivity may be significantly associated with a range of firm performance indicators like environmental performance, organizational learning and stakeholder satisfaction, which taken together provides researchers with a holistic approach of investigating the impact of investing in environmental proactivity. Furthermore, the findings have provided additional support for similar findings of past research particularly concerning the impact of environmental proactivity on financial performance (Casadesus-Masanell et al., 2009; Hamilton, 1995; Hart and Ahuja, 1996; Klassen and Whybark, 1999; Menguc and Ozanne, 2005; Russo and Fouts, 1997; Sharma and Vredenburg, 1998).

Another major contribution relates to the mediating role of stakeholder satisfaction. The relationship between environmental proactivity and financial performance has received considerable attention but the mechanisms of the relationship have been largely ignored. Stakeholder satisfaction serves as a way of explaining the otherwise complex relationship between environmental proactivity and firm financial performance. The findings indicate that stakeholder satisfaction creates a link between environmental proactivity and financial performance in such a way that explains why firms may be able to improve their bottom line by going green. A study by Berrone et al. (2007) demonstrates the mediating role of stakeholder satisfaction between corporate ethical identity and firm performance.

The two hypothesized relationships that are not supported require further explanation. First, the role of environmental performance as a mediating construct between environmental proactivity and stakeholder satisfaction is not supported. The finding seems to suggest that stakeholders might be satisfied with the apparent actions of the firm to engage in environmental proactivity and may not necessarily wait to see if improvements in environmental performance are being made. The fact that firms usually tout the actions taken to address natural environmental issues through marketing campaigns may also explain why environmental proactivity does not play a mediating role between environmental proactivity and stakeholders. This is because knowing that firms are actively trying to protect the environment by undertaking a series of activities may well be enough to satisfy stakeholders (in Malaysia) that something is being done to address their environmental concerns. Second, the result indicates that type of technologies does not moderate the relationship between environmental proactivity and operational performance. The lack of support for the moderating relationship can be because of the fact that a lot of firms (in Malaysia) employ a combination of preventive and control technologies in their efforts to limit their negative impact on the environment. Firms with leading-edge environmental proactivity have been reported to deploy the full spectrum of technologies that range from control to preventive in addition to a host of other means in a bid to tackle environmental issues (Aragón-Correa, 1998). If this is so, then to isolate the separate effects of each type of technology on operational performance may not only be difficult but may also require a different study design than is used in this study.

The two control variables, firm size and age of firm were explicitly modeled in order to determine their effects on the proposed structural model (Fletcher et al., 2006). The results obtained show that relationships between the two control variables and the firm performance outcome constructs in the model are not significant except for that of firm size and operational performance ($r = -0.16$, p-value $= 0.02$). This suggests that having a large work force does not necessarily improve operational efficiency and is understandable in the sense that the larger the work force the greater the potential for role conflict and redundant positions which would affect efficiency in an adverse way. On the other hand a smaller work force means a leaner and more flexible system that can easily be adapted to improve operational performance.

The findings of this research offer several practical contributions to firms in particular and all stakeholders in general. Among the foremost is the additional evidence that seems to indicate that environmental proactivity and financial performance are positively related. This can provide more incentives for firms that are already investing in efforts to address environmental issues and encourage those firms that are averse to environmental proactivity measures. It can also provide added ammunition for NGOs and other stakeholders who are calling for more firms to be proactive in dealing with natural environmental concerns. Policy makers and regulators can reinforce the positive association between environmental proactivity and financial performance by enacting regulations that foster financial improvements in the form of tax breaks and subsidies for environmentally proactive firms.

Another practical contribution that may be of interest to firms is the findings which seem to suggest that environmental proactivity is significantly related to other performance outcomes like stakeholder satisfaction and organizational learning besides financial, operational and environmental performances. This could enable firms to implement systems that could allow for a much more balanced evaluation of the impact of activities taken to protect the environment. Findings from this study seem to indicate that environmental proactivity is positively related to stakeholder satisfaction. This can encourage firms to improve stakeholder relations through environmental proactivity thereby ensuring that their environmental investments are rewarded. For instance, Sharma and Vredenburg (1998) found that environmentally proactive firms have better relations with host communities and it was easier for them to get through new projects thereby reducing implementation costs. Our study has covered more business outcomes

when compared to other studies (Gonzalez-Benito and Gonzalez-Benito, 2005; Sharma and Vredenberg, 1998).

An extension of the above practical contribution is the result that indicates a significant positive relationship between environmental proactivity and organizational learning. This is important in the sense that the success of any environmental strategy requires heavy employee involvement (Hart, 1995) and the findings in this study indicates that such employee involvement can help improve their ability to handle natural environmental issues. Furthermore, knowing that environmental proactivity impacts organizational learning positively can serve as an incentive for managers to seek ways to map out better strategies on how to involve employees in managing natural environmental issues and integrate proactivity into the overall organizational strategy. For instance, firms can encourage employees to be innovative in the way they handle environmental issues through an incentive-based system that rewards best performers.

The findings that indicate that environmental proactivity is positively related to operational performance is also significant in the sense that it shows that engaging in environmental proactivity is another way of improving the operational efficiency in the firm. This means that firms that want to protect the environment can invest in clean technologies that will not only reduce the negative impact of the firm on the environment but can also improve the operational efficiency of the firm, which is a potential win–win situation for the firm. Even though we have derived our conclusions by studying the Malaysian firms, we believe that this framework, which is based on strong theoretical foundations, can be further validated by studying the firms in developing and developed countries. More validation will definitely vindicate our stand that environmental proactivity does affect multiple performance outcomes of a firm and therefore, operating green makes financial, operational and environmental sense.

6. Conclusions, limitations and directions for future research

This research set out to examine the impact of environmental proactivity on multiple (five) firm performance outcomes in a bid to extend the discussion beyond the usual few (one, two or three) outcomes considered in past research. This objective and the consideration of mediating and moderating relationships in this work is an attempt to fill the gap in past research that for the most part focused on a few outcomes and no such relationships. Through this study we make following conclusions: (1) environmental proactivity measures increases environmental performance, operational performance, organizational learning, stakeholder satisfaction and financial performance, (2) stakeholder satisfaction mediates the relationship between environmental proactivity and financial performance, (3) type of technologies (prevention and control) does not moderate the relationship between environmental proactivity and operational performance and (4) environmental performance does not mediate the relationship between environmental proactivity and stakeholder satisfaction.

This research is not without limitations. First, the fact that this study is cross-sectional in nature may have limited its ability to fully capture the range of effects environmental proactivity has on firm performance. Even though the survey method of collecting data used in this study wherein respondents were asked to evaluate the impact of environmental proactivity on firm performance largely eliminates the problem with the lag issue, a longitudinal approach could provide a better picture of the impact of environmental proactivity on firm performance. Second, the limitation that became apparent during the course of this research is the difficulty of capturing the effects of firm expansion or downsizing on constructs such as operational and environmental performance. For instance, an increase in waste generation could have been as a result of added capacity rather than inefficiency, which means absolute values of waste generation, could increase whilst relative values may or may not have changed. Such situations make it difficult to determine if certain performance indicators are improving or worsening. Certainly, an improved study design may be needed so that performance indicators can be better monitored or captured in light of such occurrences. One way of going about it could be to introduce some weightage that take into account firm expansion or downsizing when measuring performance indicators. Third, the fact that only three stakeholder groups (customers, employees & stakeholders) were considered in this study is also another limitation. Getting feedback from other stakeholder groups like regulators, host communities, NGOs and the media could certainly provide a more comprehensive view of how environmental proactivity affects stakeholder satisfaction. Future research could incorporate data collected from more stakeholders as it could shed more light on the relationship between stakeholder satisfaction and environmental proactivity. Future studies could also investigate the moderating effects of the control variables used in this study. For example, the interaction effects of firm size and firm age on operational performance, organizational learning and environmental performance could be tested. Another area that could of interest is to investigate how industry contexts influence the relationship between environmental proactivity and firm performance. Research can also be carried out on an industry-by-industry basis to negate the need to test or account for industry effects. Future research can also focus on studying two-way relationships between constructs. For example, it is plausible to argue that environmentally proactive measures taken by a firm affects its financial performance and financial performance of the firm affects the environmentally proactive measures taken by the firm.

There is no doubt that a proactive environmental orientation does not come cheap, however the potential windfall is also huge, but benefits may well depend on how well firms are able to manage the impact of proactivity on factors such as stakeholder satisfaction. Failing to respond to stakeholders' interest concerning the environment may translate implicit into explicit costs for firms (Galbreath, 2006), which is amply demonstrated by the recent BP oil spill fiasco (April 20, 2010) in the Gulf of Mexico.

There are also potential offsets from green investments that should not be ignored. For example, if a taxi company decides to use hybrid cars, it may have to make substantial upfront investments but potential offsets include fuel savings, tax breaks as well as avoiding environmental taxes, not to talk of image and reputation improvement that the taxi company can leverage to gain competitive advantage. Similarly, using energy saving light bulbs can achieve up to 70% energy efficiency and implementing measures such as electronic billing can save a company millions of dollars that can offset the investments made in addition to the huge amount of paper that could be saved at the same time. Replacing old electronic equipment brings about energy savings and this could result in reduced operational costs. In the same vein, green technologies can also help businesses reduce the risk of disruptions to operations. For instance, relying on solar power can cushion against any disaster that affects power supply, thus averting losses.

Research on the natural environment firm performance interface has been going on for quite a while now particularly so in the last two decades when new evidence about the destructive nature of human activity created a compelling need for action to be taken to preserve the environment. This work is a continuation of that quest to search for knowledge that could help managers, regulators, policy makers and other stakeholders in a developing country like Malaysia make informed decisions when dealing with matters affecting the natural environment.

Appendix. Questionnaire

Section A

This section would like to determine what action(s) your firm has taken to address natural environmental issues. Please indicate the extent to which your firm has implemented the following actions by using the scale provided below.

1	2	3	4	5	6	7
Never implemented	Rarely implemented	Occasionally implemented	Sometimes implemented	Fairly often implemented	Frequently implemented	Always implemented

1	Explicit definitions of environmental policy	1	2	3	4	5	6	7
2	Long-term environmental plans and targets	1	2	3	4	5	6	7
3	Full-time employees devoted to environmental management	1	2	3	4	5	6	7
4	Natural environmental training for managers and employees	1	2	3	4	5	6	7
5	Systems for measuring and assessing environmental performance	1	2	3	4	5	6	7
6	Environmental criteria in supplier selection	1	2	3	4	5	6	7
7	Environmental arguments in marketing	1	2	3	4	5	6	7
8	Selection of cleaner transportation methods	1	2	3	4	5	6	7
9	Recuperation and recycling systems	1	2	3	4	5	6	7
10	Acquisition of clean/green technologies/equipment	1	2	3	4	5	6	7
11	Sponsoring of environmental events/collaboration with ecological groups	1	2	3	4	5	6	7
12	Regular voluntary information about environmental management to stakeholders (customers, regulators, host communities etc.)	1	2	3	4	5	6	7
13	Substitution of polluting and hazardous materials/parts	1	2	3	4	5	6	7
14	Design focused on reducing resource consumption and waste generation during production and distribution	1	2	3	4	5	6	7
15	Responsible disposal of waste and residue (separation and preparation)	1	2	3	4	5	6	7
16	Green house gasses emission inventory	1	2	3	4	5	6	7
17	Environmental evaluations for new investments	1	2	3	4	5	6	7
18	Link compensation packages to environmental performance targets	1	2	3	4	5	6	7
19	Safeguard all natural habitats affected by the operations of the firm	1	2	3	4	5	6	7

Section B

This section would like to assess the impact of your firm's environmental actions on operational performance. Please indicate the extent to which the environmental actions undertaken by your firm have improved/worsened the following using the scale provided below.

1	2	3	4	5	6	7
Much worse	Moderately worse	Slightly worse	Uncertain/no effect	Slightly improved	Moderately improved	Much improved

1	Reduction in operational costs (supply, production, distribution, etc.)	1	2	3	4	5	6	7
2	Time needed for designing new products and/or services	1	2	3	4	5	6	7
3	Range of products/services	1	2	3	4	5	6	7
4	Product/service quality (degree of conformity to specifications)	1	2	3	4	5	6	7
5	Flexibility to adapt production to different volumes of demand	1	2	3	4	5	6	7
6	Capacity to meet customer requirements in time	1	2	3	4	5	6	7
7	Pace of new product/service launching	1	2	3	4	5	6	7

Section C

Please indicate what type of environmental technologies is used by your firm to address natural environmental issues by using the scale provided below.

1	2	3	4	5	6	7
Never used	Rarely used	Occasionally used	Sometimes used	Fairly often used	Frequently used	Always used

1	Prevention technologies (target pollution at the source)	1	2	3	4	5	6	7
2	Technologies that require modification of existing processes	1	2	3	4	5	6	7
3	End of pipe control technologies (target pollution after production)	1	2	3	4	5	6	7
4	Technologies that do not require modification of existing processes	1	2	3	4	5	6	7
5	In process recycling/recovery technologies	1	2	3	4	5	6	7

Section D

This section would like to assess the effect of your firm's environmental actions on organizational learning. Please indicate the extent to which the environmental actions undertaken by your firm have affected the following by using the scale provided below.

1	2	3	4	5	6	7
Greatly decreased	Mostly decreased	Slightly decreased	Uncertain/no effect	Slightly increased	Mostly increased	Greatly increased

1	Knowledge base about natural environmental issues	1	2	3	4	5	6	7
2	Ability to look for natural environmental solutions from fresh angles	1	2	3	4	5	6	7
3	Innovative culture	1	2	3	4	5	6	7
4	Staff cooperation and information exchange	1	2	3	4	5	6	7
5	Improvements in management of environmental issues	1	2	3	4	5	6	7

Section E

This section aims to assess the impact of environmental actions on environmental performance. Please indicate the extent to which the environmental actions that your firm has undertaken have improved/worsened the following using the scale provided below.

1	2	3	4	5	6	7
Much worse	Moderately worse	Slightly worse	Uncertain/no effect	Slightly improved	Moderately improved	Much improved

1	Reduction of input material consumption	1	2	3	4	5	6	7
2	Energy use	1	2	3	4	5	6	7
3	Reduction of waste within the production process	1	2	3	4	5	6	7
4	Reduction of waste within the equipment selection process	1	2	3	4	5	6	7
5	Water usage	1	2	3	4	5	6	7
6	Reduction in green house gasses emissions	1	2	3	4	5	6	7
7	Spills and accidents	1	2	3	4	5	6	7
8	Reduction in other emissions/Effluents	1	2	3	4	5	6	7
9	Usage of harmful substances	1	2	3	4	5	6	7
10	Overall reduction in pollution	1	2	3	4	5	6	7

Section F

This section would like to assess the impact of natural environmental actions on stakeholders. Please indicate the extent to which you agree/disagree with the following statements by using the scale provided below.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Actions taking to protect the natural environment (e.g. recycling, energy conservation, cleaner production methods, reducing toxic emissions):

1	Increase customer attraction	1	2	3	4	5	6	7
2	Increase customer loyalty	1	2	3	4	5	6	7
3	Increase overall customer satisfaction	1	2	3	4	5	6	7
4	Attract more investors	1	2	3	4	5	6	7
5	Increase overall shareholder satisfaction	1	2	3	4	5	6	7

Section G

This section would like to determine the impact of the environmental performance of companies that your firm deals with. Please indicate how much you agree or disagree with the following statements by using the scale provided below.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Actions taking to protect the natural environment (e.g. recycling, energy conservation, cleaner production methods, reducing toxic emissions etc):

1	Will increase willingness to pay more for its products/services	1	2	3	4	5	6	7
2	Will make the company's products/services more attractive	1	2	3	4	5	6	7
3	Will increase the attractiveness of the company for investment	1	2	3	4	5	6	7
4	Will influence intention to do business with the company	1	2	3	4	5	6	7

Section H

This section would like to assess the impact of your firm's natural environmental actions on financial performance in the form of cost savings. Please indicate the extent to which your firm's natural environmental actions have affected the following by using the scale provided below.

1	2	3	4	5	6	7
Greatly increased	Mostly increased	Slightly increased	Uncertain/no effect	Slightly decreased	Mostly decreased	Greatly decreased

1	Cost of energy	1	2	3	4	5	6	7
2	Cost of developing new projects	1	2	3	4	5	6	7
3	Cost of input materials	1	2	3	4	5	6	7
4	Fines for non-compliance to natural environmental regulations	1	2	3	4	5	6	7

Section I

This section is for administrative and control purposes only. Please answer the questions below as appropriate.

Please specify the position you currently hold in your firm (e.g. operations manager).....

What is the total number of staff currently employed in your firm? .....

How long has this firm been in operation? .....

Please specify the industry type/classification of your firm.....

THE END.

References

Al-Tuwaijri, S., Christensen, T.E., Hughes, K.E., 2004. The relations among environmental disclosure, environmental performance, and economic performance: a simultaneous equations approach. Accounting Organizations and Society 29, 447–471.

Ambec, S., Lanoie, P., 2008. Does it pay to be green? A systematic overview. Academy of Management Perspective 22 (4), 45–62.

Amit, R., Schoemaker, P.J., 1993. Strategic assets and organizational rent. Strategic Management Journal 14, 33–46.

Anderson, J.C., Gerbing, D.W., 1988. Structural equation modeling in practice: a review and recommended two-step approach. Psychological Bulletin 103 (3), 411–423.

Ann, G.E., Zailani, S., Wahid, N.A., 2006. A study on the impact of environmental management system (EMS) certification towards firms' performance in Malaysia. Management of Environmental Quality 17, 73–93.

Aragón-Correa, J.A., 1998. Strategic proactivity and firm approach to the natural environment. Academy of Management Journal 41 (5), 556–567.

Aragón-Correa, J.A., Hurtado-Torres, N., Sharma, S., García-Morales, V.J., 2008. Environmental strategy and performance in small firms: a resource-based perspective. Journal of Environmental Management 86, 88–103.

Aragón-Correa, J.A., Rubio-López, E.A., 2007. Proactive corporate environmental strategies: myths and misunderstandings. Long Range Planning 40, 357–381.

Aragón-Correa, J.A., Sharma, S., 2003. A contingent resource-based view of proactive corporate environmental strategy. Academy of Management Review 28, 71–88.

Armstrong, J.S., Overton, T.S., 1977. Estimating non response bias in mail surveys. Journal of Marketing Research 14 (3), 396–402.

Barney, J.B., 1991. Firm resources and sustained competitive advantage. Journal of Management 17 (1), 99–120.

Baron, R.M., Kenny, D.A., 1986. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology 51 (6), 1173–1182.

Berrone, P., Surroca, J., Tribó, J.A., 2007. Corporate ethical identity as a determinant of firm performance: a test of the mediating role of stakeholder satisfaction. Journal of Business Ethics 76, 35–53.

Casadesus-Masanell, R., Crooke, M., Reinhardt, F., Vasishth, V., 2009. Households willingness to pay for green goods: evidence from Patagonia's introduction of organic cotton sportswear. Journal of Economics & Management Strategy 18, 203–233.

Christmann, P., 2000. Effects of best practices of environmental management on cost advantage: the role of complementary assets. Academy of Management Journal 43 (4), 663–680.

Claver, E., López, M.D., Molina, J.F., Tarí, J.J., 2007. Environmental management and firm performance: a case study. Journal of Environmental Management 84, 606–619.

Clarkson, M.B.E., 1995. A stakeholder framework for analyzing and evaluating corporate social performance. Academy of Management Review 20 (1), 92–117.

Clean Production Action. 2012. http://www.cleanproduction.org/Steps.Process.UN.php.

Cordeiro, J., Sarkis, J., 1997. Environmental proactivism and firm performance: evidence from security analyst earnings forecasts. Business Strategy and the Environment 6, 104–114.

Darlaston-Jones, D., 2007. Making connections: the relationship between epistemology and research methods. The Australian Community Psychologist 19 (1), 19–26.

Dyllick, T., Hockerts, K., 2002. Beyond the business case for corporate sustainability. Business Strategy and the Environment 11 (2), 130–141.

Easton, V.J., McColl, J.H., 1997. Statistics Glossary. v1.1. The Steps Project.

Elkington, J., 1994. Towards the sustainable corporation: win–win–win business strategies for sustainable development. California Management Review, 90–100 (winter).

Fiol, C.M., 1994. Consensus, diversity, and learning organizations. Organization Science 5 (3), 403–420.

Fiol, C.M., Lyles, M.A., 1985. Organizational learning. Academy of Management Review 10 (4), 803–816.

Fletcher, T.D., Selgrade, K.A., Germano, L.M., 2006. On the Use of Partial Covariates in Structural Equation Modeling (PDF Document). Retrieved from: http://www.umsl.edu/~fletcher/papers/partialcov.pdf.

Freeman, R.E., 1984. Strategic Management: a Stakeholders Approach. Pitman, Boston.

Freeman, R.E., 2004. A Stakeholder Theory of Modern Corporations: Ethical Theory and Business. Pitman, Boston.

Fryxell, G.E., Vryza, M., 1998. Managing environmental issues across multiple functions: an empirical study of corporate environmental departments and functional co-ordination. Journal of Environmental Management 55, 39–56.

Galbreath, J., 2006. Does primary stakeholder management positively affect the bottom line? Some evidence from Australia. Management Decision 44 (8), 1106–1121.

Garcia de Madariaga, J., Valor, C., 2007. Stakeholders management systems: empirical insights from relationship marketing and market orientation perspectives. Journal of Business Ethics 71, 425–439.

Gilley, K.M., Worrell, D.L., El-Jelly, A., 2000. Corporate environmental initiatives and anticipated firm performance: the differential effects of process-driven versus product-driven greening initiatives. Journal of Management 26, 1199–1216.

González-Benito, J., González-Benito, Ó., 2005. Environmental proactivity and business performance: an empirical analysis. Omega 33, 1–15.

Grant, R.M., 1991. The resource-based theory of competitive advantage: Implications for strategy formulation. California Management Review, 114–135 (spring).

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., 2010. Multivariate Data Analysis, fifth ed. Pearson Prentice Hall, New Jersey.

Hamilton, J.T., 1995. Pollution as news: media and stock market reactions to the toxics release inventory data. Journal of Environmental Economics and Management 28, 98–113.
Hart, S.L., 1995. A natural-resource based view of the firm. Academy of Management Review 20 (4), 986–1014.
Hart, S.L., Ahuja, G., 1996. Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance. Business Strategy and the Environment 5, 30–37.
Huntzinger, D.N., Eatmon, T.D., 2009. A life cycle assessment of Portland cement manufacturing: comparing the traditional process with alternative technologies. Journal of Cleaner Production 17, 668–675.
Hutchinson, C., 1996. Integrating environmental policy with business strategy. Long Range Planning 29 (1), 1–23.
Jamali, D., 2008. A stakeholder approach to corporate social responsibility: a fresh perspective into theory and practice. Journal of Business Ethics 82, 213–231.
Johnstone, N., Labonne, J., 2008. Why do manufacturing facilities introduce environmental management systems? Improving and/or signaling performance. Ecological Economics 68, 719–730.
Judge, W.Q., Douglas, T.J., 1998. Performance implications of incorporating natural environmental issues into the strategic planning process: an empirical assessment. Journal of Management Studies 35 (2), 241–262.
Kassinis, G., Vafeas, N., 2006. Stakeholder pressures and environmental performance. Academy of Management Journal 49 (1), 145–159.
King, A., Lenox, M., 2002. Exploring the locus of profitable pollution reduction. Management Science 48 (2), 289–299.
Klassen, R.D., McLaughlin, C.P., 1996. The impact of environmental management on firm performance. Management Science 42 (8), 1199–1214.
Klassen, R.D., Whybark, D.C., 1999. The impact of environmental technologies on manufacturing performance. Academy of Management Journal 42 (6), 599–615.
Knox, S., Maklan, S., French, P., 2005. Corporate social responsibility: exploring stakeholder relationships and programme reporting across leading FTSE companies. Journal of Business Ethics 61, 7–28.
Lanoie, P., Tanguay, G., 2000. Factors leading to green profitability: ten case studies. Greener Management International 31, 39–50.
Lee, P.T., 2005. Implementing ISO 14001: is it beneficial for firms in newly industrialized Malaysia? Journal of Cleaner Production 13, 397–404.
Lindsey, T.C., 2011. Sustainable principles: common values for achieving sustainability. Journal of Cleaner Production 19, 561–565.
Link, S., Naveh, E., 2006. Standardization and discretion: does the environmental standard ISO 14001 lead to performance benefits? IEEE Transactions on Engineering Management 53 (4), 508–519.
Lopez-Gamero, M.D., Molina-Azorin, J.F., Claver-Cortes, E., 2009. The whole relationship between environmental variables and firm performance: competitive advantage and firm resources as mediator variables. Journal of Environmental Management 90, 3110–3121.
Lozano, R., 2008. Envisioning sustainability three-dimensionally. Journal of Cleaner Production 16, 1838–1846.
Melnyk, S.A., Sroufe, R.P., Calantone, R., 2003. Assessing the impact of environmental management systems on corporate and environmental performance. Journal of Operations Management 21, 329–351.
Menguc, B., Ozanne, L., 2005. Challenges of the green imperative: a natural resource based approach to the environmental orientation-business performance relationship. Journal of Business Research 58, 430–438.
Miles, M., Covin, J., 2000. Environmental marketing: a source of reputational, competitive and financial advantage. Journal of Business Ethics 23, 299–311.
Mitchell, R.K., Agle, B.R., Wood, D.J., 1997. Toward a theory of stakeholder identification and salience: defining the principle of who and what really counts. Academy of Management Review 22 (4), 853–886.
Molina-Azorín, J.F., Claver-Cortés, E., Pereira-Molina, J., Tarí, J.J., 2009. Environmental practices and firm performance: an empirical analysis in the Spanish hotel industry. Journal of Cleaner Production 17, 516–524.
Montabon, F., Sroufe, R., Narasimhan, R., 2007. An examination of corporate reporting, environmental management practices and firm performance. Journal of Operations Management 25, 998–1014.
Newton, T., Harte, G., 1997. Green business: technicist kitsch? Journal of Management Studies 34 (1), 75–98.
Orsato, R.J., 2006. Competitive environmental strategies: when does it pay to be green? California Management Review 48 (2), 126–142.
Palmer, K., Oates, W.E., Portney, P.R., 1995. Tightening environmental standards: the benefit-cost or the no-cost paradigm? Journal of Economic Perspectives 9 (4), 119–132.
Porter, M., van der Linde, C., 1995a. Towards a new conception of environment-competitiveness relationship. Journal of Economic Perspective 9 (4), 97–118.
Porter, M., van der Linde, C., 1995b. Green and competitive: ending the stalemate. Harvard Business Review, 120–134.
Roberts, L., Gehrke, T., 1996. Linkages between best practice in business and good environmental performance by companies. Journal of Cleaner Production 4 (3–4), 189–202.
Ruf, M.B., Muralidhar, K., Paul, K., 1998. The development of a systematic, aggregate measure of corporate social performance. Journal of Management 24 (1), 119–133.
Russo, M.V., Fouts, P.A., 1997. A resource-based perspective on corporate environmental performance and profitability. Academy of Management Journal 40 (3), 534–559.
Sambasivan, M., Fei, Y.N., 2008. Evaluation of critical success factors of implementation of ISO 14001 using analytic hierarchy process (AHP): a case study from Malaysia. Journal of Cleaner Production 16, 1424–1433.
Sangwan, K.S., 2011. Development of a multi criteria decision model for justification of green manufacturing systems. International Journal of Green Economics 5 (3), 285–305.
Schultz, M., 2002. Organizational learning. In: Baum, Joel. A.C. (Ed.), Companion to Organizations. Blackwell Publishers, Oxford, UK.
Sharma, S., Vredenburg, H., 1998. Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. Strategic Management Journal 19, 729–753.
Shrivastava, P., 1995. Environmental technologies and competitive advantage. Strategic Management Journal 16, 183–200.
Sumiani, Y., Haslinda, Y., Lehman, G., 2007. Environmental reporting in a developing country: a case study on status and implementation in Malaysia. Journal of Cleaner Production 15, 895–901.
Van Fraassen, B., 2002. The Empirical Stance. Yale University Press, New Haven.
Wagner, M., 2007. Integration of environmental management with other managerial functions of the firm. Long Range Planning 40, 611–628.
Wagner, M., 2005. How to reconcile environmental and economic performance to improve corporate sustainability: corporate environmental strategies in the European paper industry. Journal of Environmental Management 76, 105–118.
Wagner, M., Schaltegger, S., Wehrmeyer, W., 2001. The relationship between the environmental and economic performance of firms. What does theory propose and what does empirical evidence tell us? Greener Management International 34, 95–108.
Walley, N., Whitehead, B., 1994. It's not easy being green. Harvard Business Review, 46–52. May June.