Eco-labelling and Firm Financial Performance

Abstract

Eco-labels are alleged to attain the labelled firm with enhanced financial performance. However, there is virtually no empirical evidence on the impact of eco-labelling on firm financial performance. This study seeks to fill this gap by determining whether eco-labelled firms report superior financial performance compared to equivalent firms without an eco-label. Regression analyses of secondary accounting data of 858 firms indicate that eco-labelled firms report superior return on sales. Contrary to suggestions from the CSR literature and the resource-advantage theory, the findings suggest that the positive effect diminishes and that financial returns are hampered over time. This contradict that eco-labelling induce innovative learning effects resulting in a long term comparative advantage. These findings have practical and academic implications related to the design and implementation of eco-labels and the study significantly contribute to the emerging debate concerning the financial value of environmental investments. Limitations and directions for future research are discussed.

Introduction

In a world threatened by growing environmental challenges, the need for a clear understanding on how to successfully implement environmental concerns is eminent. Despite tremendous efforts in establishing a link between environmental investments and firm financial performance, the debate seems to be mired in contradictions and uncertainty (Barnett and Salomon, 2006; Beurden and Gössling, 2008; McWilliams and Siegel, 2000; Wagner et al., 2002). The literature contains virtually no discussion regarding the dynamic nature of environmental responsiveness – a necessary aspect as environmental responsiveness is said to develop over time, and depend upon the interaction between internal and external variables (Russo, 2009; Wahba, 2008). This study propose that some of the previous fuzziness could have been resolved by acknowledging that environmental strategies are not created equally, nor are they capable of giving definitive financial returns. There is a need for research that disaggregates the concept of corporate social responsibility (CSR) when studying the effect on financial performance. The study draws attention to the case of eco-labelled firms.

Eco-labels may be perceived as a strategic investment that refers to ecological aspects of CSR (see Dahlsrud 2008 for an overview of the CSR concept). Eco-labelling is a voluntary programme where the criteria are determined by an impartial third party. The goal is to ensure that the labelled firm reduces harmful impacts on the environment, by establishing environmental requirements for the firms overall products *and* processes. In turn, the programme promise performance enhancement for the labelled firm. The concept stand as both future oriented and timely innovative, and in the complexity and ambiguity of organizational life the label seems to offer hope and relief for managers.

However, "fads and fashion" like eco-labels has been the subject of criticism (Abrahamson, 1991; Sturdy, 2004). There seem to be a good rationale for arguing that firms seldom implement concepts verbatim, but select the part suitable to improve their own needs. Eco-labels may not only be seen as a toolkit to reduce harmful impact on the environment, but also as a symbol giving the firm higher credibility. Consequently, what actually happens in the implementation of an eco-label may only be coupled loosely to, or even completely detached from, the content which its originators had in mind (i.e Benders and Van Veen, 2001). Such circumstances could contribute to unforeseen problems and the expected success may not occur. The costs might outweigh the resulting benefits (Friedman, 1970), and the extents to which eco-labels can fulfil their promise of profitable solution to environmental challenges seem uncertain. With each passing year, the diffusion of the labels broadens,

which underscores the need for credible evidence on its efficacy that can inform theory and practice.

To a certain degree, the dearth of empirical work in this area is understandable, given that eco-labelling of firms – as compared to eco-labelling of products- is a new, albeit rapidly growing phenomenon. Unfortunately this has left many important research questions largely unexplored – especially the extent to which eco-labelling provides firm with a competitive advantage, as evidenced by superior financial performance. This study seeks to fill this gap by empirically integrate eco-labels into a framework explaining firm financial performance. The purpose is to add to the existing literature on environmental investment by offering an understanding of the strategic value of specific types of environmental strategies, more specifically marketing related environmental investments like eco-labelling. The following research questions are in focus: Do eco-labelled firms report superior financial performance compared to equivalent firms without an eco-label? How does this relationship change as the labelled firm learn from the programme by experience? To articulate arguments linking eco-label to measures of performance, the study utilize the resource-advantage theory. Given the attributes of eco-labels, which induce the refinement of a market orientation, the resource-advantage theory offers the potential to identify when and where the programme might unlock organizational potential.

The article is structured as follows. First, conceptual definitions and theoretical perspectives on environmental investment are presented. Then hypotheses are developed and presented, followed by a methodological section focusing on the empirical data and operationalizations. Third, the results of the multiple regression analyses are presented. Then the discussion section takes place; including theoretical contributions, practical implications, limitation and direction for future research.

Theoretical Insight

The rise of Eco-labels

The roots of eco-labelling can be found in growing global concern for industrial impacts on the environment, and the labels have been viewed as a promising self-regulatory market mechanism for improving the industry's environmental performance (Warnken et al., 2005). Either it is for moral concern, as a search for a competitive advantage, or as a consequence of the threat of bankruptcy in the case of non-adaption; firms are spending a substantial amount of money to obtain these labels, leading to a rapid development of eco-label programmes.

Beginning with the German Blue Angel in 1977, eco-labelling schemes have been established in a wide range of countries e.g. the Nordic Swan and the Eco-lighthouse in the Nordic countries, the EU Flower in the EU, and the Energy Star in the United States. The number of local, regional, national and international eco-labels have increased significantly during the second half of the 1990s, and the number of eco-label programmes has grown from a mere dozen worldwide in the 1990s to more than 400 programmes today (Delmas and Grant, 2008).

A recent trend is to award not only products, but entire firms with an eco-label. Eco-labelled firms are different from firms which has eco-labelled products in their assortment, as there are requirements related to the firms overall processes. These requirements usually vary depending on type of industry, but some common elements may be detected. These include concerns related to use of resources, use of energy and chemicals, and requirements regarding waste-disposals, suppliers, and transportation. Eco-labelling of firms may therefore be defined as a voluntary method of environmental performance certification performed by a third party, where the label indicates that the firm has a proactive response in order to prevent negative environmental impacts. The main purposes of the labels are to raise stakeholder's awareness about environmental effects of the firm's processes, services and products, and to encourage firms to develop more environmentally friendly production-methods and technologies. In turn the labels promise performance enhancement for the labelled firm due to improved reputation, effectiveness or cost-efficiency.

In contrast to the wide development of eco-label programmes, the literature on the topic is relatively scarce and incomplete. The literature reports willingness to pay for eco-labelled products (Aguilar et al., 2009; Bjørner et al., 2004; Blend and Ravenswaay, 1999; Hansmann et al., 2006; Loureiro et al., 2002; Noblet et al., 2006; Sammer and Wüstenhagen, 2006; Trudel and Cotte, 2009), but there is little knowledge about the characteristic of the green consumer (Pedersen and Neergaard, 2006; Thompson et al., 2010). Studies concerning the market impact of introducing eco-labelled products have reported contradictory results (First and Khetriwal, 2010; Gallastegui, 2002; Larson, 2002; Sedjo and Swallow, 2002; Teisl et al., 2002), which may indicate that there is an inconsistency between consumers' intentions and actual behaviour. Finally, the previous literature focuses almost without exception on eco-labelled products, missing the opportunity to study the labels relationship to firm specific assets. The extent to which the label actually results in enhanced financial performance for the firm remains largely unexplored.

Corporate Social Responsibility and Firms Financial Performance

The debate concerning the relationship between corporate social responsibility (CSR) and financial performance has been going on for decades. As time passes, there is a growing consensus in the literature regarding the possible financial benefits of responsible investments (Beurden and Gössling, 2008; Garriga and Melé, 2004; Shen and Chang, 2009). Yet, conflicting results are being presented (Elsayed and Paton, 2005; Wagner et al., 2002). These contradictory results seem to have turned the debate from its originally focus on a direct relationship between CSR and financial performance, to a debate more focused on drawbacks related to methods or measurement issues (Elsayed and Paton, 2005; Horváthová, 2010; Salama, 2005; Telle, 2006) omissions of relevant variables (Aragón-Correa and Sharma, 2003; First and Khetriwal, 2010; Husted and Allen, 2009; King and Lenox, 2001; Luo and Bhattacharya, 2009; McWilliams and Siegel, 2000; Rueda-Manzanares et al., 2008; Russo and Fouts, 1997), and/or towards a lack of clear direction of causality (Barnett and Salomon, 2006; Waddock and Graves, 1997).

The resource-based view (Barney, 1991; Dierickx and Cool, 1989; Wernerfelt, 1984) has gained a predominant position within this CSR discourse, as it offers a distinct explanation on how responsible investment, through intangibles related to reputational assets, unique know-how and capabilities, may be a source of sustained competitive advantage. However, critics argue that markets have an underdeveloped role within this perspective (Barney 2001; Priem and Butler, 2001; Srivastava et al., 2001), that there is a lack of dynamism (Hunt, 1976; Priem and Butler, 2001), and that the perspective fails to account for institutional forces (Bansal and Clelland, 2004; Oliver, 1997).

To enhance the understanding of mechanisms that might turn an environmental investment into financial performance, the incorporation of marketing is needed (Chabowski et al., 2010). The reason is partly because marketing is uniquely able to assess costumers needs and the firms potential for gaining competitive advantage and financial performance (Hult and Ketchen, 2001; Hunt and Arnett, 2004).Yet, little empirical work has been done in marketing that examines how environmental marketing strategy is related to firm performance (Baker and Sinkula, 2005).

This study seeks to add to the previous literature by taking advantage of the complementarities offered by the interdisciplinary perspective of the resource-advantage theory. It is suggested that a disequilibrium perspective align more easily with the notion of environmental responsibility (Maxfield, 2008), and that marketing aspects is a necessary explanans for understanding the strategic value of eco-labelling. To date, the combined

potential of the resource-advantage (R-A) theory and environmental responsiveness has been poorly explored with the exception of the studies carried out by Hu and Fatima Wang (2009) and Crittenden et al.(2011).

The Resource-Advantage theory

The resource-advantage (R-A) theory (Hunt, 1997; Hunt and Lambe, 2000; Hunt, 2001; Hunt and Arnett, 2004; Hunt and Derozier, 2004) may be viewed as an extension of the resource-based view which incorporates marketing theory, institutional economies and the necessary dynamism (see Hunt and Davis, 2008 p.12 for an overview on how RBV and R-A thoery differ). The theory is a disequilibrium provoking, process theory of competition that stresses the importance of comparative advantages in resources, and marketplace positions of competitive advantage.

As resources are combined they may constitute a comparative advantage in resources for that firm in efficiently and /or effectively producing particular market offerings that have value for some market segments. Firms that successfully develop market offerings will occupy marketplace position of competitive advantage. As the theory maintains that marketplace position of competitive advantage determine superior financial performance, the competitive advantage result in a superior financial performance for the firm. Long term competitive advantage may be attained if the firm engage in pro-active innovation, continually reinvest in the resources that produced the competitive advantage, and/or rivals acquisitions and reactive innovation efforts fail. Rivals are believed to fail, or take long time to succeed, if the advantage-producing resource is not easily copied. This may occur when the resource is causally ambiguous, socially complex, highly interconnected, tacit or has time compression diseconomies or mass efficiencies. Table 1 show the key constructs of the resource-advantage theory's foundational premises.

Developing hypotheses

The growing empirical evidence concerning the impact of intangibles on firm performance indicates that intangibles should be giving attention when studying firm financial performance (Fernández et al., 2000; Fulmer et al., 2003; Galbreath, 2005; Hall, 1992, 1993; Roberts and Dowling, 2002). To articulate arguments linking eco-labels to firm financial performance, the following section concentrates on three intangibles which in the literature have been postulated to be of greatest strategic importance: innovation resources, human

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capital, and reputation resource (Surroca et al., 2010). The arguments are summarized in figure 1.

Innovation resources

Innovation is central within the R-A theory as it relates deeply to the dynamism of the perspective and because it is viewed as a fundamental determinant of value creation. Innovativeness is present when implementation of new ideas, products or processes is encouraged (Hult and Ketchen, 2001), and implementation of innovative organizational concepts is considered highly important for a company's competitiveness (Alcaide-Marzal and Tortajada-Esparza, 2007; Armbruster et al., 2008). Voluntary initiatives towards sustainability have also been postulated to be important drivers of innovation (Nidumolu et al., 2009; Wahba, 2008), indicating that eco-labelling may have the capacity to offer the firm valuable innovative resources.

The eco-labelling programme offers criteria designed to ensure not only that the firm comply with existing regulations, but to ensure that the labelled firm take a pro-active stand towards environmental issues. For instance, the requirements for waste and energy includes concerns about resources applied in the production (i.e. degree of harmful chemicals, the ability to recycle) energy consumption, water consumption and waste disposal, and there are specific requirements related to each industry. This indicates that the programme demands several changes at the firm level, and that creation of new ideas concerning the firm processes; products and services are to be encouraged. The programme might offer the firm a tool to improve its resource-productivity and thereby reduce or minimize the production of waste.

Several studies have linked responsible initiatives to competitive advantage by referring to differential advantages or cost-savings associated with enhanced resource-productivity (Hart, 1995; Hull and Rothenberg, 2008; McWilliams and Siegel, 2001; Melnyk et al., 2003; Porter and Linde, 1995; Porter and Kramer, 2006; Russo and Fouts, 1997). Consistent with the R-A theory this suggests that eco-labelling may lead to innovation resources that give the labelled firm an efficiency advantage by providing costumers the similar relative value as competitors at lower cost, or effectiveness advantages attained from providing customers with more relative value than competitors at similar costs.

Reputation

 The R-A theory maintains that it is the societal institutions that form the "rules of the game", and attention to institutional forces is necessary in order to stay in the game (Hunt and Lambe, 2000). By having a good reputation, firms may increase their legitimacy, gain enhanced support from their surroundings leading to increased sales or improved access to resources and thereby superior financial performance (Brunsson, 1989; Meyer and Rowan, 1977). A firm's reputation may therefore be viewed as a result of how well the firm's activity meets the social expectations of appropriateness.

 A wide array of research links environmental investments to reputational advantage in the market place (Backhaus et al., 2002; Fulmer et al., 2003; Hansmann et al., 2006; Miles and Covin, 2000; Rodrigo and Arenas, 2008; Turban and Greening, 1997). However, a good environmental reputation depends on the extent to which the firm communicates about its responsible initiatives (Bhattacharya et al., 2008; Maignan and Ferrell, 2004).

 Enhanced stakeholder identification is said to be triggered by including CSR images in organizational communications (Husted and Allen, 2009; Maignan and Ferrell, 2004), indicating that eco-labels, unlike many other environmental efforts at the firm level, are well suited to communicate the environmental practices of the firm to various stakeholders. As a market orientation that encompasses a broad base of stakeholder provides an avenue to stronger competitive advantage (Crittenden, 2011; Hunt and Lambe, 2000) the impression that eco-labels might be beneficial for a firm's reputation becomes strengthened. Finally, the theory suggest that stakeholders have imperfect information, opening up for the idea that symbols and trademarks might be beneficial in order to reduce stakeholders searching costs (First and Khetriwal, 2010; Hunt and Lambe, 2000).

 The communicational aspects of the labels complete the environmental development of a company by emphasizing the importance of market relations. Therefore, it is plausible to argue that eco-labelling may foster a more favourable relationship between the firm and its stakeholders. This favourable relationship could ultimately strengthen the market-performance link, leading to superior financial performance (Ben Brik et al., 2011).

 Due to the comparative advantage attained from innovation resources and/or improved reputation, it is suggested that eco-labelled firms can attain a competitive advantage in the marketplace in effectively or efficiently producing a market offering. Hence, following hypothesis is presented:

H1: Eco-labelled firms report superior financial performance than equivalent firms without an eco-label.

Human resources

Human resources, like organizational learning and tacit knowledge, have increasingly gained attention within the strategic management literature and within the R-A theory (Wittmann et al., 2009). The competence derived from these resources is difficult to observe as they tend to be both causally ambiguous and socially complex. Therefore they might present an opportunity for long term competitive advantage, assuming that the competence contribute to a positional advantage in the marketplace (Hunt et al., 2002; Wittmann et al., 2009).

Despite being a standardized concept, eco-labels may be very differently implemented even under isomorphic pressures. The programme emphasize the need to communicate the implementation of an eco-label thoroughly in the organization to ensure that all the environmental requirements are properly and continuously taken care of (Miljøfyrtårn, 2010; Svanemerket, 2010). This suggests that the implementation of an eco-label should be people intensive and depend upon the tacit skill development through employee involvements, leading to "hard to copy" firm specific outcomes.

As various stakeholders increasingly demand responsible firm behaviour, knowledge on how to efficiently manage environmental aspects may help the firm strengthen valuable stakeholders' relationship (Bhattacharya et al., 2008). Knowledge of pollution prevention and enhanced resources-productivity is particular relevant, since such knowledge may be related to cost- or differential advantages (Porter and Linde, 1995), but also because of the threat of environmental regulation. A pro-active approach to environmental challenges may help the firm attain competences which enable the firm to more quickly and efficiently adapt to new regulations with lower cost than its competitors (Berry and Rondinelli, 1998; Lash and Wellington, 2007). Finally, the label not only target costumers, but explicitly point to the importance of building a green supply chain – an important aspect in order to develop distinct advantages.

This suggests that eco-labelling might represent a learning platform for increased knowledge concerning effective, efficient and responsible management of modern organizations, that transform environmental performance into long term financial performance (i.e. Delmas, 2001; Horváthová, 2010; Menguc and Ozanne, 2005; Russo, 2009). As time passes, the firm capture a comparative advantage related to the unique competence

created from continuously attention to improvements and newness in processes - a competence that is uniquely tied to the specific firm's ability to innovate.

H2: Years of eco-labelling is positively related to superior financial performance.

Method

The Eco-lighthouse

The Eco-lighthouse is an official Norwegian eco-label programme aimed at reducing the industry's negative impacts on the natural environment. The programme is mainly directed towards small and medium firms. The measure promises not only to reduce harmful impacts on the environment, but to be profitable, concrete, relevant and simple. During the certification process the firm gets access to an external consultant. The requirements are evaluated and raised according to demands in the market. When the requirements are met, the firm is awarded with the eco-label. The license is valid for three years. To renew the license the firm needs to document that the current requirements for the eco-label are met. The documentation relies on self-reported data. In May 2010 a total of 1524 private firms, 82 governmental institutions, 62 county institutions and 619 municipalities' institutions were labelled as the Eco-lighthouse.

Sample and Data

The empirical setting employed in this study is independent Norwegian limited liability companies (LLC). Norwegian LLC's are chosen to be the unit of analyses as most of the determinants for a successful use of environmental information's are in place in the Nordic market (Leire and Thidell, 2005; Thøgersen, 2000), and because of excellent access to archival accounting data of Norwegian LLC's with and without eco-label.

The initial phase of the selection process began by identifying all LCC's that had received the Eco-lighthouse label. In 2009, 1171 Norwegian LCC's were Eco-lighthouses. This sample was matched with a control sample of firms along the following dimensions; firm legal form (LLC), number of employees, two-digit nace-code, annual turnover in 2009 and county. Accounting data were drawn from www.forvalt.no and Eniro ASA. Cases with no matches were deleted, cases with missing data in the key dimensions were removed, and pairs where both firms were eco- labelled where excluded from the sample, leaving 791 pairs. Because the study relies upon archival financial data from 2009, only LCC's labelled before 31.12.2008 were included in the final sample. Suitable matches were found for 429 labelled

firms, making a final sample of 858 firms. To be able to test for changes in performance before and after labelling, accounting-data were obtained for two years: 2007and 2009.

Measures

Dependent variable

The dependent variable is superior financial performance, measured as return on asset (ROA) and return on sales (ROS). Measures of performance rooted in financial accounting have received a lot of criticism due to the complexity of the performance concept, the possibility of managerial manipulation, differences in accounting techniques and differences between industries (Chakravarthy, 1986; Davidson and Worrell, 1990). However, accounting-based measurements have the ability to capture firms internal efficiency in some way (Orlitzky et al., 2003), and as the R-A theory emphasize comparative advantages in resources this measurement become appropriate. By including critical control variables some of the problems with accounting data are reduced (Murphy et al., 1996).

Return on Equity (ROE) and Return on Asset (ROA) are probably the most widely reported measures of firm's financial performance (Griffin and Mahon, 1997; Waddock and Graves, 1997) and both are commonly used in the CSR literature (Davidson and Worrell, 1990; Russo and Fouts, 1997). This study utilizes ROA. The reason is twofold; ROA is assumed to be a more conservative measure of performance than ROE. A positive effect on ROA can be generalized to ROE, but the converse is not true (Murphy et al., 1996). Secondly, a difference in ROA may indicate that the firm has an excess value of intangibles in relation to the control group. ROA shows how profitable a firm asset is in generating revenue, and is given by the ratio between net income and the average of total asset.

Return on sales (ROS) is selected because of its sensitivity as an overall indicator of profitability. Any change in return on equity is seen first in change in return on sales (Ruf et al., 2001). ROS also indicate how much the firm is profiting from its sales, and can be seen a measure of how efficient the company is. As the integrated framework suggest that eco-labelling leads to improved efficiency through increased sales or enhanced resource-productivity, a performance measure of efficiency is in place. ROS is measured as net income before taxes divided by sales, and its usefulness has been demonstrated in numerous studies (Telle, 2006).

Independent variable

The independent variable is the eco-label: The Eco-lighthouse, used as a dummy-variable.

Control variables

The controls; risk, age, size and industry are selected based on previous research findings. Risk and age are critical controls when trying to measure financial performance, as they have been associated with firm financial performance (McGuire et al., 1988). Risk is measured as the log of long term debt to total asset ratio. Size gain relevance because of its connection to financial performance, and because some evidence suggest that bigger firms attract more attention from the external environment. Bigger firms might be overrated in terms of their CSR initiatives (Liston-Heyes and Ceton, 2009). Size is measured as the log of total asset.

R&D intensity has been positively associated with financial performance (Capon et al., 1990; McWilliams and Siegel, 2001), and there are some suggestions that corporate social performance and R&D are correlated (McWilliams and Siegel, 2000). This indicates that it will be difficult to isolate the impact of the eco-label on financial performance without simultaneously controlling for R&D. Unfortunately; few Norwegian firms report their R&D expenses. To overcome this problem this study follows Waddock and Graves (1997) approach which controls for industry. R&D expenses are found to vary with industry and by controlling for industry these differences are taken into account. There is also the possibility that a socially responsible entity may earn less than an irresponsible manufacturing company simply because of regulation (Davidson and Worrell, 1990). To control for industry the matching process included the two-digit nace-code.

Result

The hypotheses are tested using ordinary least squared regression. Regression analyses are useful to statistically control for additional variables when exploring the predictive ability of a model (Capon et al., 1990; Pallant, 2007). The shape of the distribution as histograms indicated that the scores are reasonable normally distributed. This was supported by an inspection of the normal probability plots. An inspection of the difference between the mean and the trimmed mean indicated that none of the scores had strong influence on the mean (Pallant, 2007). Table 1 shows the means, standard deviations, VIF statistics and Pearson correlation among the variables. The VIF statistics indicate that multicollinearity is not a

serious problem in the models (VIF< 2). The correlations matrix indicates that eco-label is not directly related to any of the dependent variables, indicating that an inclusion of control variables is important to reveal the relationship between environmental responsibility and firm financial performance.

To test H1 separate regressions were performed for each of the financial variables, ROA and ROS. Model 1 show only the control variables and the two dependent variables; ROA and ROS, whereas model 2 includes the independent variable; eco-label. Given that each model was estimated for two dependent variables, a total of 4 multiple regressions were carried out. The results are presented in table 3. Each of the models is significant overall at the $p < 0.005$ level. Table 3 show that eco-label is weakly positively related to Return on Sales, and weakly negatively related to Return on Asset. None of the models give support for a statistical significant relationship between eco-labelling and firms' financial performance. Hypothesis 1 is not supported.

The second hypothesis proposed that years of eco-labelling would contribute positively to superior financial performance. To test hypothesis 2, the sample was divided into two groups. The first group included firms labelled for 3 years or less and their respective matches, and the second group contained firms labelled for more than 3 years and their respective matches. This threshold was chosen in order to divide the sample into equally large parts. Separate regressions were then performed for each of the financial variable, ROA and ROS resulting in a total of four regression analysis. Model 1 and 2 represent the regression for the group which contain firms labelled for 3 years or less, and model 3 and 4 represent the regressions for the groups containing firms labelled for more than 3 years. The results are presented in table 4. Hypothesis 2 is not supported. On the contrary, the results indicate that during the first three years of labelling, eco-labelling is weakly positively related to ROA and positively and significantly related ROS. Hence, increased experience with the label seems to hamper possible financial gains.

To further investigate the possibility for a negative relationship between years of labelling and firm financial performance, regression was performed on a sample of eco-labelled firms. The dependent variables were ROA and ROS, controls were age of firm, size and risk and the independent variable years of eco-labelling. The results (table 4) confirmed that years of eco-labelling is negatively and significantly related to both ROA and ROS. This indicates that eco-labelling may contribute to superior financial performance, thus giving some support for hypothesis1, but that years of labelling moderate the relationship between

eco-labelling and firm's financial performance in such a way that the financial return decreases.

A central assumption of causal explanation is temporal sequentiality (Hunt, 1976). If labelling causes superior financial performance, then the labelling must occur before performance is measured. A separate analysis was therefore carried out only on firms which were labelled in 2008 and their respective matches. This resulted in a sample of 362 firms. Regressions were run with ROA 2007 and ROS 2007 as the dependent variables, risk 2007, size 2007 and age 2007 as controls and eco-label as the independent variable. Identical regressions were run with data from 2009. The results of the regressions indicated that eco-labelling was not significantly related to ROA or ROS in 2007, but that labelled firms had significantly higher ROS than unlabelled firms in 2009.

Discussion

This study intended to empirically demonstrate the connection between eco-labelled firms and financial performance. By examining secondary accounting data of 852 firms; regression analyses suggested that eco- labelled firms report superior return on sales during the first three years of labelling. This indicates that eco-labelling, as anticipated, have the ability to increase a firm's efficiency. The analyses did not detect any significant effect on return on assets. One explanation might be that return on sales is a more sensitive measure of financial performance than return on assets. The findings support the notion that various measures of performance may be differentially affected by a similar phenomenon.

The research inquiry also produced an unanticipated finding. The results demonstrated that eco-labelling is significantly and positively related to return on sales, yet there seem to be factors that induce this effect to diminish over time. Among labelled firms, there is a significant and negative relation between years of labelling and firm financial performance measured as ROA or ROS. Excluding years of labelling actually invalidate the relationship between eco-labelling and return on sales. These findings are significant, not only because they may offer a preliminary explanation of why previous studies has yielded contradictory result; the time-factor is an important moderator, but because the result points to possible faults within the labelling programmes.

One of the critics concerning environmental standards has been that concepts seldom are fully adopted; they are merely implemented to attain the firm with higher credibility. This suggestion is consistent with the expectation that CSR strategies are developed in order to attain the firm with a differential advantage through improved image. The focus becomes very

much on achieving certification, and certification may be interpreted by the firm as an indication that the firm has arrived (Wayhan et al., 2002). Further efforts to increase the firm's environmental performance may be perceived as too costly as there in the early stage of pollution prevention is a chance for a great deal of easy and inexpensive changes that result in large emission reduction relative to costs. As the firms environmental performance improves, further reductions become progressively more difficult and expensive (Hart, 1995). This could cause the firm hesitate to make further improvements. The firm becomes satisfied merely to attain certification, while firms in the matched sample perhaps continuously improve through other means.

This kind of interpretation of eco-labelling may keep the firm from innovative learning and thereby threaten possible financial gains in the long run (Harnesk and Abrahamsson, 2007). As the R-A theory maintain that a long term competitive advantage may be attained if the advantaged firm continually reinvest in the produced advantage, the creation of new incentives within the labelling programme might be necessary to increase the firm's motivation to continually innovate effectively and/or in a cost-efficient way.

Theoretical contribution

Recently, several authors has urged researcher to pay attention to the complexity of the CSR concept (Halme and Laurila, 2009; McWilliams and Siegel, 2000; Russo and Fouts, 1997; Surroca et al., 2010). By revealing how omitted variables might inflict the relationship between responsible investments and financial performance their research has indicated that the relationship is complicated and that the topic needs to be disaggregated into more specific and concrete relationships before definitive answers can be found.

This study contributes to an increased understanding of the strategic value of marketing related investments, and demonstrates how the resource advantage theory can be used in such endeavour. The resource advantage theory seems to offer CSR researcher a tool for refining the analyses of the strategic value for two reasons. First, the resource-advantage theory has a strong focus on superior financial performance, thereby contributing to a dynamic picture of the relationship. Secondly, the Resource-Advantage theory supports the arguments made by the resource-based view, but extends the understanding of the strategic value of environmental investments by recognizing the importance of marketing. Marketing is uniquely able to assess costumer's needs - complementarities which may enhance the firm's opportunity to gain a competitive value of its environmental investments.

By integrating newly emerging works of CSR into the resource- advantage theory a novel framework explaining the strategic value of eco-labelling was proposed. The value of the framework is that it explicitly distinguishes between comparative advantage in resources and positional advantages in the market place, thereby giving a distinct explanation on why and how eco-labelling may contribute to resources that entail the firm with a competitive advantage in the market place. Parts of the framework were tested through empirical analyses, and by so doing the study advance the process of empirically integrate an environmental perspective into the marketing literature.

The results demonstrate that eco- labelled firms report superior return on sales, but that the effect diminishes over time. Following the presented theoretical model, the diminishing effect may be explained as a consequence of no or little motivation for additional improvements after having achieved certification. However further investigation is required for definitive conclusion. The findings add new evidence to the growing body of research suggesting that environmental responsiveness yields financial advantages, but extend existing research by revealing how the notion of time, might inflict the relationship between marketing related environmental investment and financial performance.

Finally, a comparison of performance measured before and after the year of the labelling, suggested that eco-labels are associated with subsequent financial performance and not with prior financial performance. This finding provide new evidence to a much debated issue on whether responsible behaviour leads to increased financial performance or whether the latter implies availability of more fund to devote to the former (Elsayed and Paton, 2009).

Implications for managers and practitioners

First, managers should not assume that a business strategy that includes a commitment to the environment is inconsistent with the proposition that the first priority of any firm is its own welfare and that of its stakeholders. However, practicing managers should recognize that all environmental strategies are not created equally, nor are they capable of giving financial return definitive. The empirical findings suggest possible fallacies related to the implementation of eco-labelling – indicating that practitioners should be cautious of quick fixes to environmental challenges. Eco-labelling might be financial beneficial for firms, but in order to maintain the competitive advantage derived from the labelling process; commitment, marketing and continuously improvement of internal processes might be necessary. Hence, it is not an approach for everyone.

Secondly, the study provides policy makers with information for designing improved methods and tools for increasing innovation, creativity and sustainability. Emphasis on controls and data dissemination combined with transparent and consistent methodology to compare efforts which reduce harmful impacts on the environment, could perhaps strengthen the long term incentives for innovative efforts towards sustainability (Styles et al., 2009).

Limitations and Future research

Future research would benefit from continuing to study and validate the effect of environmental labels in greater detail. This study is one of the first that seek to reveal the relationship between eco- labelled firms and financial performance. So even though the sample size is satisfying, replication of the study is needed to ensure reliable conclusions. By repeating studies at regular intervals, it would also be possible to measure dynamic change in the influence of eco-labelling on financial performance - an interesting case as the demand for responsible firm behaviour is likely to increase.

Further, the study only suggests whether eco-labelling relates to firm financial performance or not. How and why it relates to financial performance remains mainly unexplored. The study demonstrates a relationship and the prior discussion suggests some likely avenues, but the explication of the specific mechanism at play is left for future studies to pursue. The study has particularly pointed out the possibility that eco-labelling may hamper innovative learning, and that this problem might diminish if the programme offered the labelled firm higher incentives to continuously reinvest in the produced advantage. Self-reported data concerning firms' environmental improvements may not be sufficient. Hence, future studies would benefit from investigating eco-labelling programmes which differ in design.

Future research should also give increased attention to the measure of financial performance used in the studies of CSR. This study used accounting based measures of financial performance, and the analyses illustrated that various measure was differentially affected by the similar phenomenon. Other measures might offer a different picture of the relationship. Hence, future research would benefit from providing a theory based rationale for examining the given measure, and explicitly state the performance variable under investigation. Then future research will be able to build upon previous work rather than becoming mired in contradiction.

Finally, this study has focused entirely on the financial impacts of eco-labels. The environmental impacts of the labels have not been explored, and the conclusion that labelling

is synonymous of environmental improvements is yet to be made. In fact, differentiation may increase sales, and this quantitative effect of eco-labelling may actually be harmful to environment (Youssef and Lahmandi-Ayed, 2008). Research in this area is important. However, measuring environmental impacts is problematic (Delmas and Blass, 2010). Many schemes have operated for too short time to be analyzed, and for the established schemes; quantifying the environmental impact of eco-labelling is difficult. Solutions for overcoming these problems are needed to ensure that the labels operate according to their intention of reducing harmful environmental impacts.

Conclusion

   This study has made an attempt to avoid some of the problems that existed in earlier studies concerning responsible investment and financial performance. Rather than relying on multidimensional constructs of CSR, the study disaggregated the concept by focusing on eco-labelled firm.

   By drawing upon the resource-advantage theory and by integrating newly emerging works of CSR a novel framework explaining the strategic value of eco-labelling was proposed. Two issues were highlighted: the relationship between eco-label and superior financial performance and the moderating effect of experience with the label. It was suggested that eco-labelling could be financial beneficial because of the comparative advantage attained through innovation resources; reputation and /or human resources.

   Through empirical examination of 858 limited liability firms the study advances the process of empirically integrate an environmental perspective into the marketing literature. The results provide preliminary support for the theoretical model explaining the strategic value of eco-labelling: eco- labelled firms report superior return on sales during the first three years in the labelling programme. However the study also points to possible fallacies related to quick fixes on environmental concerns. Further inquiry will be necessary to give definitive conclusion.

   Overall the findings support the notion that environmental aspects of business operation should be given attention, not only because of the benefits for the natural environment, but because if it's possible connection to superior financial performance. The contributions are timely as eco-label schemes increasingly are seen as a possible solution of combining competitive strategy with a responsible outcome.

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Tables

Table 1

Key constructs and foundational premises of the Resource-Advantage theory

Demand	Heterogeneous across industries
	Heterogeneous within industries
	Dynamic
Consumer information	Imperfect
	Costly
Human motivation	Constrained self-interest seeking
Firm objective	Superior financial performance
Firm information	Imperfect
	Costly
Firm resources	Financial
	Physical
	Legal
	Human
	Organizational
	Informational
	Relational
Resources	Heterogeneous
	Imperfectly mobile
Management role	Recognize strategies
	Understand strategies
	Create strategies
	Select strategies
	Implement strategies
	Modify strategies
Competitive dynamics	Disequilibrium-provoking
	Innovation endogenous

Source: Hunt and Derozier 2004

Table 2

Descriptive statistics and Pearson correlation (N=852)

	Mean	SD	VIF	1	2	3	4	5
Control variables								
1.Age of firm	2.679	.704	1.070	1				
2. Size	9.477	1.854	1.091	.240**	1			
3. Risk	.152	.177	1.030	-.043	.148**	1		
Independent variable								
4.Eco-label	.501	.500	1.004	.048	.043	.024	1	
Dependent variables								1
5.Return on Asset	12.506	55.936		-.022	-.120**	-.092**	-.040	
6.Return on Sales	.046	.164		.047	.182**	.053	.032	.270**

*p<0.1**p < .05; ***p < .01 (2-tailed)

Table 3
Regression results

	Hypothesis 1			
	N=857		N=852	
	Return on Asset		Return on Sales	
	Model 1 Control variables only	Model 2 Eco-label added	Model 1 Control variables only	Model 2 Eco-label added
Control variables				
Age of firm[a]	.001	.002	.006	.005
Size [a]	-.108***	-.107**	.176***	.175***
Risk[a]	-.074**	-.073**	.028	.027
Independent variable				
Eco-label	-	-.030	-	.024
R square	.019	.020	.034	.034
Adjusted R square	.016	.016	.030	.030
F value	5.647***	4.428**	9.871***	7.522***
ΔR square		.001		.001
F change		.773		.492

*p<0.1**p < .05; ***p < .01
[a] The variable is logarithmically transformed

Table 4
Regression results

	Hypothesis 2					
	N = 420	N = 415	N = 439	N = 439	N = 448	N = 447
	Duration of eco-labelling ≤ 3years		Duration of eco-labelling > 3years		Negative relationship – years of eco-labelling	
	Model 1 Return on Assets	Model 2 Return on Sales	Model 3 Return on Assets	Model 4 Return on Sales	Return on Assets	Return on Sales
Control variables						
Age of firm[a]	-.075*	-.013	.010	.029	.008	.048
Size [a]	.125**	.223***	-.184***	.131***	.079*	.138**
Risk[a]	-.197***	.027	.047	.045	-1.91***	.058
Independent variable						
Eco-label	.039	.089**	-.056	-.059		
Years of labelling					-.085**	-.104**
R square	.050	.060	.043	.025	.047	.037
Adjusted R square	.041	.051	.034	.016	.039	.028
F value	5.444***	6.537***	4.831***	2.808**	5.493***	4.215**

*p<0.1**p < .05; ***p < .01
[a] The variable is logarithmically transformed