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The link between 'green' and economic success: environmental management as the crucial trigger between environmental and economic performance

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The link between environmental and economic performance has been widely debated in the literature for the last ten to fifteen years. One view is that improved environmental performance mainly causes extra costs for the firm and thus reduces profitability. However, also the opposite has been argued for: improved environmental performance would induce cost savings and increase sales and thus improve economic performance. Theoretical and empirical research have provided arguments for both positions and have not been conclusive so far. This article discusses reasons for the different views and the differences in empirical research and presents a theoretical framework to explain the coexistence of the conflicting views. It is argued that not merely the level of environmental performance, but mainly the kind of environmental management with which a certain level is achieved, influences the economic outcome. The model presented provides implications for both empirical research and company management in practice. Research and business practice should focus less on general correlations and more on causal relationships of eco-efficiency, i.e. the effect of different environmental management approaches on economic performance.

Keywords: corporate environmental management, environmental performance, economic performance, eco-efficiency.

Introduction

The link between being 'green' and being an economically successful company has been a core topic of the corporate environmental management literature for some years (see e.g. Jaggi and Freedman, 1992; Walley and Whitehead, 1994; Cohen *et al*., 1995; Feldman *et al*., 1996; White, 1996; Hamilton, 1995; Hart and Ahuja, 1996; Johnson, 1995; Klassen and McLaughlin, 1996; McGuire *et al*., 1988; Morris, 1997; Russo and Fouts, 1997; Steinle *et al*., 1998; Butz and Plattner, 1999; Wagner and Wehrmeyer, 2001). Some authors assume that environmental protection mainly causes costs to a company whereas others believe that environmental protection generally pays off and thus improves the firms' bottom line (e.g. Cohen *et al*., 1995; Porter and van der Linde, 1995; WBCSD, 1997). The entirety of empirical studies provides arguments for both sides. However, there seem to be many studies supporting the hypothesis that good environmental performance is not punished, or turned the other way around—that bad performance does not pay off (Wagner, 2000).

One reason for these differences in the results of empirical studies may be different data sets used.

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The relationship between environmental effort and profit may differ depending on the regulatory regime in a country, the cultural setting, customer behaviour, the type of industries or size of companies analysed, the time span, etc.

Another reason for the conflicting results of the various empirical studies, as highlighted in this paper, may be the lack of a clear theoretical framework within which to investigate the links between environmental performance and economic performance. The theoretical framework discussed in this paper suggests that it is not the pure fact of being green but the way in which a certain level of environmental performance has been achieved that influence whether the correlation between environmental and economic performance is positive or negative. This is in line with the argument that the question whether it pays to be green is insufficient and that rather the question which should be investigated is when it pays to be green (see e.g. Reinhardt, 1999). Based on a framework we give some recommendations for further research within this field.

Environmental issues influence business and business influences environmental protection and quality

It has been stated many times that company management often does not pay enough attention to the fact that environmental issues have become an economic reality (e.g. Buchholz, 1993; Porter and van der Linde, 1995; Welford, 1994). In many cases environmental issues influence both costs and income of a company and therefore have a more or less direct influence on the economic success of a company (causal effect A in Figure 1).

The second hypothesis is that good economic performance drives environmental performance (causal effect B in Figure 1). Commonly used approaches are regression analysis, (model) portfolio studies, event studies, and in depth case studies (Day, 1998). This hypothesis is often based on the belief that good environmental performance and quality is a kind of luxury good for a company when it has reached a high level of economic success. Ytterhus and Sjaker (1998) find that managers perceive good financial conditions as one of the most important success factors for improving the environmental performance.

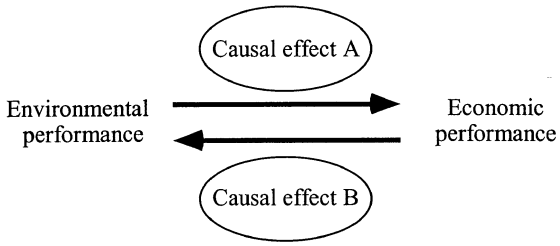

Figure 1. Current approaches of analysis.

However, these direct links do not seem to exist in practice nor do they stand up to more thorough theoretical analysis. From a management perspective there is no natural or mechanical law automatically linking environmental with economic performance. One might argue that in some cases regulations might create obvious links between environmental and economic performance. This may hold true in specific cases where the regulatory tools give strong economic incentives for continuous improvements in environmental performance. The question to what extent environmental protection activities result in an improvement of the economic success depends on a variety of factors such as the consumers' willingness to pay for environmentally friendly goods in a given market, the kind of environmental and health regulations in a country, the stakeholder pressure in different industries, the level of technological development, etc. Furthermore, environmental issues must be of a certain, maybe even major, financial importance to have some impact on the company's economic performance. In addition, the company must face some degree of competition in the market because otherwise economically inefficient behaviour does not necessarily have a measurable impact on the profit.

Given the diversity of constantly changing factors which may influence the relationship between environmental and economic performance it seems that the way in which these factors are identified and how the company management acts in respect to them may be of significant influence on the economic performance.

Moreover, as with management success in general the economic success of environmental protection activities will depend on the quality of managerial decisions taking various factors into account. The argument can be put forward that those companies will be more economically successful which know

how to improve their environmental performance in the most economical manner.

In an idealized model assuming complete competition, only economically oriented, (i.e. efficient) environmental protection will be sustainable. An environmentally friendly company which is not economically successful will sooner or later disappear from the market and therefore also its environmentally beneficial activities. Even worse, green idealists will—after having received some 'pats on the back' in the beginning—be a deterrent example for other, economically successful companies.

To judge whether more environmental protection activities will be economically rewarding, company management would have to identify the specific set of restrictions and incentives it faces. Furthermore, the management should be able to identify environmentally induced economic opportunities and threats. As a next step objectives and goals would have to be defined, plans developed and concrete actions taken. The respective environmental protection activities will then result in a new and different environmental profile, which in turn may result in cost savings and/or improved market opportunities.

For companies in a competitive market where environmental protection is of some importance, it is thus reasonable to assume that the relation between environmental and economic performance depends on the kind of management activities, strategies and concepts and whether they are applied correctly in the right situations (i.e. there is a fit of the environmental management approach with the given situation) rather than on any mechanistic causal link. The importance of the kind of corporate environmental management for the environmental and economic performance of a company and the economy as a whole cannot be overestimated. If a company is able to increase its economic success by a progressive environmental management it will face less company-internal and company-external distribution conflicts and will therefore become an example for others to follow.

The interrelated effects between environmental protection and economic success should therefore be considered more carefully and their explicit integration should be pursued more systematically. In this sense corporate environmental management is a concept which helps managers to systematically focus entrepreneurial efforts to reduce environmental impacts of a company in the most economically efficient manner possible.

Not every kind of environmental management increases the economic success: a theoretical framework

Fundamental concept of relation

Two schools of thought have emerged regarding the effect of corporate environmental protection on the economic success. Some feel that the current level of corporate environmental protection often conflicts with other business objectives, particularly that of increasing the economic success. This postulated relation is shown in Figure 2 by line ES_0-E-F-D. Beginning at a certain level of economic success (e.g. a certain shareholder value ES_0) every environmental protection activity (moving to the right in Figure 2) will reduce the economic success.

The negative marginal impact on the economic success can be expected to increase. Below point D in Figure 2, with an economic success of 0 and the amount of environmental protection of EP_0, the company becomes unprofitable.

Others believe that not only is the current level of corporate environmental protection economically sustainable, but also that the environmental protection practised by a company even has a beneficial effect on its economic success (e.g. point A and thus ES* in Figure 2 is achieved with the amount EP* of environmental protection). However, nobody will actually believe that an indefinite number of pollution prevention activities will still increase the economic performance. Net marginal benefits from environmental protection will be decreasing (picking the 'low hanging fruit' first) and sooner or later

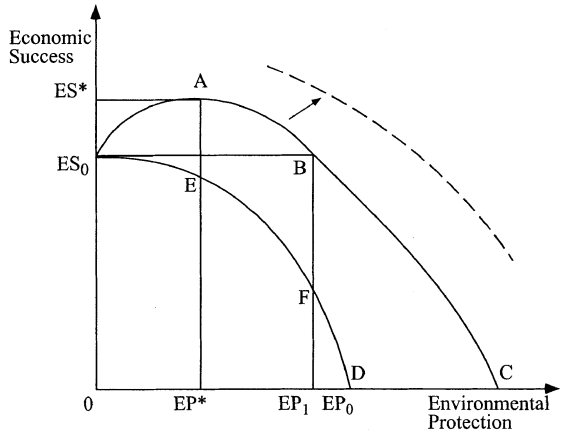

Figure 2. Possible relations between corporate environmental protection and economic success.

the increased environmental effort will represent net costs (after point A in Figure 2).

There may be several reasons for the different views on the relationship between environmental performance and economic success. The perception of a pure trade-off may stem from a feeling that there are economic disincentives for corporate environmental protection, that the firm is incapable to take advantage of economic opportunities, through a strong focus on short-term profit or pure ignorance.

Most industries with a certain level of environmental impact are faced with economic incentives for some degree of environmental protection. The managerial challenge then includes two interrelated dimensions: (1) choosing the optimal level of environmental performance which potentially results in the highest economic success (E*) and (2) obtaining that level of environmental performance at the lowest possible costs in order to realise the maximum of economic success. We can thus assume that the suggested functions not only represent a perception of the link between environmental and economic performance, but that they also represent qualitative differences in managerial decisions. One answer to the question of when it pays to be green is thus that it depends on the kind of environmental management which is established in a company. The upper curve shows good environmental management materialised by both cost efficiency and market gains, while the lower curve represents poor (inefficient) management (characterised by costly end-of-the-pipe-technologies, etc.). As the company on the upper curve in Figure 2 manages its environmental protection in an economically better way than a company on the lower curve the slope A-B-C is flatter than E-F-D because of the lower marginal costs (a) of environmental protection for the second company. Thus, the curves express that the economic success depends on the kind of environmental management applied and how well it takes the specific situation of the company into account. The curve might furthermore be influenced by other, company external and internal factors such as industry specific circumstances, technologies, the size of the company, etc.

In reality the described functions may not be as smooth as shown in our model. Fixed costs of environmental protection, for example costs induced to establish an environmental management system would cause 'steps' in the cost function. The same may occur for the revenues, for example due to sudden shifts in demand when passing a threshold value for environmental performance (e.g. due to image gains, certification or product labels, etc.).

Several factors may lead to a shift of the curve to the right (dashed curve in Figure 2). The development of environmentally friendly technologies reduce the marginal costs of environmental protection over time, changes in consumer preferences increase the market gains of good environmental performance, regulatory changes reward good environmental performance, the new introduction of eco-products by a large retailer, etc.

With this interpretation the model proposes a wide range of possible economic outcomes between curve ES_0-E-F-D and curve ES_0-A-B-C in Figure 2. The population of firms may be somewhere in the space between the two curves. It is thus not surprising that empirical studies lead to very different results. Selecting different samples from the wide range of companies spread between the curves may lead to conflicting results about the relationship between environmental effort and economic performance unless the samples are very large. Furthermore, the curves may vary both over time and between countries or continents and industries providing different sets of companies analysed.

Two conclusions follow from Figure 2. First, the environmental performance can vary at a given level of economic success. Point B in Figure 2 reflects the same economic success as point ES_0. The difference is that one level of economic success reflects environmental ignorance whereas the other level represents a high degree of environmental responsibility.

Second, the economic effect of corporate environmental protection can vary at a given environmental performance level. For instance at EP* the economic success can vary between A and E, where A represents a situation where the potential economic gains of environmental improvement are fully realised, whereas E represents a situation where inefficient environmental management incurs a loss of economic performance as compared to the initial level ES_0.

Third, the correlation between economic and environmental performance, or in other words the question of when it pays to be green, does not only depend on company external variables but it substantially depends on internal variables which are influenced by management. Managerial qualities moderate the relationship between environmental and economic performance and superiority in environmental performance does not necessarily lead to competitive advantages (Christmann, 2000; Karagozoglu and Lindell, 2000). Environmental management, and the question how a certain level of environmental performance has been achieved, becomes an additional explanatory variable which

has been neglected in the respective correlations studies to dare. As a result the question becomes crucial: what kind of environmental management is good environmental management?

Implications for empirical studies and environmental management

The proposed model to structure the relation between economic and environmental performance provides two sets of implications, firstly, for researchers who want to carry out empirical studies and, secondly, for company management. Both sets of implications are based on the consideration that the economic success of a company primarily is influenced by the kind of, rather than the amount of, environmental protection activities.

Implications for empirical studies

Corporate environmental effort has an impact on the economic success and thus the enterprise value. However, the crucial question for empirical research on this topic is not just how much environmental protection is practised by a company but rather by the combination of what level of environmental protection has been achieved and what kind of environmental protection that is practised by a company.

The proposed framework implies that empirical studies should not just correlate two data sets representing environmental performance or protection activities and economic performance, but rather investigate the effect of different environmental management concepts on eco-efficiency—the combination of economic and environmental performance (Figure 3).

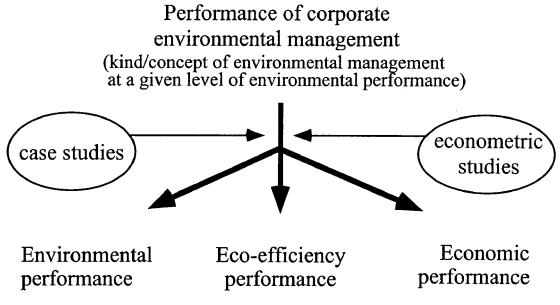

Figure 3. Management as the trigger between environmental and economic performance.

In other words, to understand and measure the links between environmental protection and economic success it is crucial to analyse the quality of environmental management with respect to the range of possibilities for improving the environmental performance in the most economic manner.

Two research strategies to investigate what kind of environmental management results in both an improvement of environmental and economic performance are possible. The first research strategy is to draw the focus away from the typical large sample statistical research approach to more in-depth case studies. The case-study-based strategy tries to test the practical relevance of theoretically determined factors driving the economic effects of corporate environmental management by analysing specific companies. An example of this strategy is the case-study tests of the effects of the drivers of environmental shareholder value (Schaltegger and Figge, 1997). Complex processes and links may sometimes be investigated better in case studies as they provide more insight into the causal mechanisms.

However, case studies, most often based on small samples with high individual data quality and company-specific information, may result in widely different answers of whether it 'pays to be green'. If we assume that most firms have chosen an environmental profile lower than EP* and that few companies are very inefficient in their environmental management, then any analysis of the company's profit will reveal a positive correlation between environmental performance and economic success. On the other hand, if many companies are positioned to the right of the economically optimal level of environmental protection (EP > EP*) negative correlation may result.

The second, statistically based strategy, attempts to estimate the *ex post* economic impact of good environmental management on basis of large data sets with mostly unspecific information and low data quality. According to the proposed model in Figure 2, two (linked) kinds of questions can be analysed.

The economic effects of different environmental management concepts

'Comparable' companies being at the same level of environmental performance are analysed. This provides information about the vertical distance between line ES_0-E-F-D and curve ES_0-A-B-C in the model in Figure 2 (e.g. the difference between A and E at level EP*) and thus the different economic effects of various corporate

environmental management concepts applied in companies with comparable environmental performance levels. This kind of analysis provides information about the transformation curve ES_0-A-B-C between environmental and economic performance in the model in Figure 2 if the best observed practice is equal to the theoretically best approach.

Following this strategy requires firstly that groups of environmental management concepts (e.g. market oriented or process oriented environmental management approaches such as described above versus minimum compliance with EMAS or ISO 14001 standard, having no systematic environmental management system, etc.) and the relevant factors driving the economic effects of corporate environmental management (which may again be different according to the environmental management approach chosen) are distinguished. Secondly, these different concepts and factors must then be made measurable for company-external analysts and the respective data sets have to be compiled in order to carry out the statistical analysis. The fact that other factors influence the economic success, such as market conditions, the regime of general business regulations, the available technology, the development of the world economy, etc. underlines the necessity to control for other variables by isolating their effects in the analysis.

The environmental and economic effects of a given environmental management concept applied in comparable companies

Companies with the same environmental management concept (e.g. eco-control or EMAS) but different levels of environmental and economic performance are compared. The results of such analysis could be used to compare the actually realised eco-efficiency of different management approaches. This kind of analysis provides information about the best (i.e. the most eco-efficient) observed practice of each management concept. This requires again that different environmental management concepts are characterised and distinguished very clearly. Only then comparisons could be made on an empirical basis. Testing these effects requires statistical approaches that handle more than one dependent variable. Relevant statistical methods would be structural equation modelling or regression analysis applied on equation systems.

Implications for environmental management

All points in the area ES_0-A-B-ES_0 in Figure 2 show so called 'no-regret-solutions' compared to the original point ES_0. However, it is rational for company management to aim at achieving point A because it is superior to the initial point ES_0 from an economic perspective. Thus, company leaders who completely ignore voluntary environmental protection activities also ignore some important financial issues and give away economic opportunities. This may make economic sense in a world of many excellent business opportunities which are larger than the environmentally driven ones. Nevertheless, management needs to assess the potential costs and benefits of every project to make the right priorities, and then analyse whether an environmentally induced opportunity results in a net economic profit (Schaltegger and Burritt, 2000, 89ff.; Schaltegger and Figge, 2000). This requires that the management is not ignorant of but is rather aware of potential business opportunities. Or in other words, environmental ignorants are bad economists and managers.

Furthermore, the kind of environmental management applied by a company creates the difference between the economic performance of comparable companies at a given level of environmental performance. It is therefore obvious that the choice of economic management of corporate environmental protection activities is not just to find the optimal level of environmental protection but rather to first choose the best matching (i.e. cost efficient) environmental management concept and to initiate environmental learning processes in the company.

Given the large number and the fast development of different environmental management approaches, management should not delegate the design of the environmental management concept to anybody. This challenging procedure should rather be understood as a managerial decision and design process where the appropriateness of different environmental management concepts are analysed closely in the context of the specific situation and in regard to the main environmental problems of the company.

The relation between corporate environmental protection and economic success can also be influenced by environmentally beneficial innovations so that the curve ES_0-A-B-C shifts into the direction of the dashed curve in Figure 2. In this context it has to be mentioned that an ISO 14001 or EMAS certificate is not sufficient to judge the economic or environmental effects of an environmental

management system because of the openness of the standard (see e.g. Berkhaut *et al*., 2001; Wagner and Wehrmeyer, 2001). For management the crucial question therefore arises: what is good environmental management?

What is good environmental management?

The quality of environmental management has to be assessed on the basis of the corporate objectives. Corporate objectives may differ between profitability, market share, political power, social benefit created, etc. However, in any case a certain level of economic profitability has to be achieved to survive in the market. Thus, in our concept good environmental management is characterised by, firstly, being able to exhaust the economic benefits and cost savings of environmental protection measures (i.e. to follow the upper curve ES_0-A-B-C in Figure 2), and secondly, by being able to identify the optimal amount of environmental protection (EP*) to realise the maximum economic success (ES*). Such environmental management increases the shareholder value of a company (e.g. Schaltegger and Figge, 2000) and can focus on market success (and increasing revenues) through environmental differentiation and/or on process excellence by reducing costs and increasing eco-efficiency (see e.g. Wagner and Schaltegger, 2001).

In the first case, market oriented corporate environmental management focuses on increasing revenues. It supports market research, product development and market positioning with a superior eco-marketing and communication approach. The company and its products are acknowledged as quality leaders, and its sophisticated environmental management contributes substantially to this position. Furthermore, general factors of economic success such as stakeholder satisfaction and reputation may be addressed by good eco-marketing practices.

In the second case, the production processes are optimised to reduce costs with environmental management tools which support the identification of eco-efficiency potentials and the successful implementation of eco-efficiency enhancing measures. To identify the cost minimising way of clean production and environmental protection managers must explore and compare various technological alternatives concerning their environmental and financial consequences. The company has to establish environmental cost accounting, investment appraisal and other environmental information management systems to compute and analyse process data and an eco-control system to strengthen the successful implementation of efficiency measures (Epstein, 1996; Schaltegger and Burritt, 2000).

In any case, the quality and impact of corporate environmental management will depend on how well it matches the specific company situation and its market, political and social circumstances.

Conclusions

The basic framework proposed in this paper focuses on a crucial element in understanding the link between corporate environmental performance and economic performance and sheds some light to the conflicting empirical results in this field of research.

Managerial qualities, materialised both by the choice of environmental profile and way how economically a certain profile can be achieved, determine the link between environmental and economic performance. Only after having designed and established the best (i.e. for the company most suitable and economically efficient) environmental management concept, management can, secondly, choose the economically best amount of corporate environmental protection activities. From an economic and eco-efficiency perspective point A in Figure 2 should be chosen and the amount of environmental protection should be adapted to an innovation-shifted transformation curve ES_0-A-B-C. It is only now, after having optimised the corporate environmental management system in market-oriented (increasing revenues) or eco-efficiency enhancing (cost reducing) terms that choosing the economically desired level of environmental performance reflects social responsibility and the comparative valuation of economic and environmental goals.

According to this basic framework, empirical studies should focus more on the different environmental management concepts applied in different companies to explain the causal relations, and the correlations between environmental protection activities and environmental management on the one hand and economic performance on the other hand.

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