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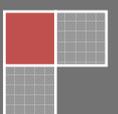
Thesis

MST-80424

The relationship between environmental performance and financial performance accounting for the strategic and innovative orientation of organisation



Ekaterina Grekova
Wageningen University
Management Studies Group



Management Summary

For centuries the main purpose of organizations was gaining profit. People were changing the environment to derive money not realizing how big their impact on the planet already is. Nowadays the climate change, Polar Sea ice loss and the other environmental problems lead to the question: “How can we make the modern economy act in a sustainable way?” In spite of the fact that concerns about environment are becoming more important, financial performance cannot be ignored as well. Hence, the relationship between environmental and financial performance is extensively investigated nowadays. A number of studies (e.g. Schaltegger and Synnestvedt, 2002) suppose that the relationship between environmental and financial performance is spurious and a correlation is explained by extraneous variables such as strategic and innovative orientation of organisations.

The goal of the research is to explore the relationship between firm strategic orientation, innovation and environmental performance, as well as explore the causal effects of the firm’s environmental performance on financial performance by studying the existing literature about the identified relationships among the concepts. The general research question is: *What is already known about a relationship between environmental performance and financial performance and mediating variables like innovation and corporate strategy?* The sub - questions investigating the connection between innovative and strategic orientation, strategic orientation and environmental performance are designed to complete the research model. A special attention is paid to the existing approaches to environmental performance measurement.

Theoretical framework

According to the research framework (Figure 1) the research investigates the environmental performance - financial performance link. The prior research has not provided a clear viewpoint on the relation. The majority of studies search for the correlation between the two concepts and in most cases the correlation exists. Moreover, environmental and financial performance is positively correlated. However, the correlation is not the same as causation. The fact that higher environmental performance is normally associated with higher financial performance (and the other way around, low environmental performance with low financial) does not mean that higher environmental performance causes higher financial performance. So it appeared to be more important to find a plausible explanation for the existing positive correlation.



Figure 1. The research model

Klassen and McLaughlin (1996) empirically found a positive correlation between the environmental events such as environmental awards announced by independent units and financial performance measured through the stock return change following the environmental event. What is more, they mentioned the pathways through which environmental performance can enhance financial performance – through market gains and cost savings. Organisations can derive market gains through market share gains. They can be obtained by companies promoting sustainable development - such companies can expect expanding the markets and overperforming competitors who did not prove themselves as the one acting sustainable. Klassen and McLaughlin (1996) state that “green” certification provides organisations a good chance for differentiation. One more path here is a higher product contribution margin. The advantages of acting in a sustainable way can be also realized through the cost savings. This aspect has several dimensions – from obvious economy on pollution fines to establishing industry standards.

Many authors provide similar explanations (Salzmann et al. (2005), Porter and van der Linde (1995), Schaltegger and Synnестvedt (2002), etc.). Schaltegger and Synnестvedt (2002) made a step further. Eco-efficiency is considered as an outcome of the environmental protection – economic success relation. The problem “does it pay to be green” is repositioned by them into the problem which environmental management quality (strategy) should be chosen to reach the highest possible eco-efficiency level.

The idea that environmental care can be financially beneficial was called by Porter and van der Linde (1995) a “dynamic” approach. This view is even more famous as a “Porter’s hypothesis” in the scientific literature. It states that the “properly crafted” strict environmental regulation facilitates innovation reducing the costs of compliance and enhancing the overall efficiency. Hence, brings about economic benefits. According to Porter’s hypothesis the companies who go green first obtain a significant first mover advantage especially valuable in the international markets.

It was opposed to so - called “static” traditional approach. The proponents of a traditional approach support the idea of negative correlation between environmental and financial performance. It says that the costs of environmental commitment are too high compared to potential benefits. Moreover, it causes a decrease in profitability and hence in the shareholders’ wealth (Waddock and Graves, 1997).

A lot of studies found that there is no correlation at all between environmental and financial performance (Zhang and Stern (2007), etc.) or did not report a clear view (Hart and Ahuja, 1996). Financial performance is influenced by many factors so it is very difficult to define the weight of environmental performance in financial performance’s change. There is also an option that environmental and financial performance are not strongly related but there is a spurious component like innovation or strategy that influences both variables (Schaltegger and Synnестvedt, 2002). For example, more innovative companies normally are more active in sustainable development and also have higher financial results (King and Lenox, 2001). The strategy can also be important for investigating environmental performance-financial performance relation. That’s why the study also accounts for the relation between innovative and strategic orientation. As for the strategy, the distinction is based on Porter’s (1985) generic strategies and Miles’ et al. (1978) strategic types. Concerning the innovative orientation, the study accounts for product/process/market, open/closed and explorative/exploitative innovation.

Overall conclusions

The review of the studies on the environmental performance-financial performance relation has revealed that the most studies support the idea of a positive link by proving a positive correlation between the two variables. The benefits from environmental investments can be harvested through market gains and cost savings. The prospectors/differentiators can win more from market gains while defenders/cost leaders – from cost savings.

The link between innovative and strategic proactiveness of organisations is established. It is shown that organisations opting for more proactive strategies (prospectors/differentiators) are associated with open/explorative/”product new to the market” innovation. While companies with defensive strategies (cost leadership according to Porter) tend to closed/exploitative/process innovation. Taking into account the fact that in general prospectors financially outperform defenders, it appears that open/explorative/product innovation can, indeed, lead to a more favourable financial position.

The relation between strategic types and environmental strategies is investigated. It follows that more proactive corporate strategies (such as prospector) are associated with more proactive environmental strategies, leading to the higher environmental performance. To complete the circle, the higher environmental performance is associated with the higher financial performance.

To sum everything up, two types of organisations can be distinguished. Prospectors/cost leaders using open/explorative/product innovation to pursue more proactive environmental strategies reach a higher level of environmental performance and financial success. Defenders/cost leaders opt for closed/exploitative/process innovation and less proactive environmental strategies. It leads to the lower environmental performance. Hence, defenders/costs are financially inferior to prospectors/cost leaders.

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Abbreviations

CERES - the Coalition for Environmentally Responsible Economies (introduced GRI)
CSR – Corporate Social Responsibility
DfE – design for environment
ECI – Environment condition indicators
EMAS - Eco-Management and Audit Scheme
EMS – Environmental management system
EPI – Environment performance indicator
GRI - Global Reporting Initiative
ISO – International Standardisation Organisation
MPI – Management performance indicators
OPI – Operational performance indicators
R&D – Research and Development
SMEs – Small and medium enterprises
TQM – Total Quality Management
TQEM – Total Quality Environmental Management
TRI - Toxic Release Inventory
WBCSD – World Business Council for sustainable development

Chapter 1.

1. Introduction

1.1. Research background

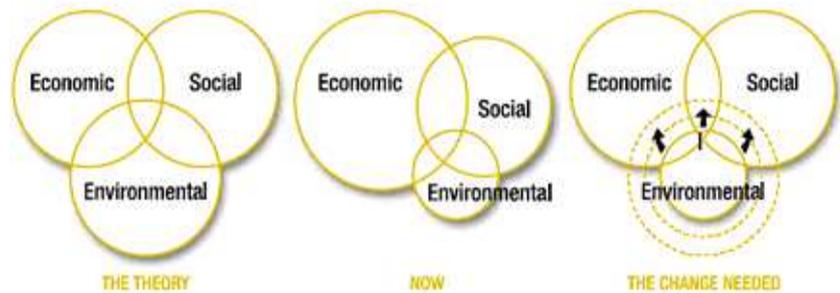
For centuries the main purpose of organizations was gaining profit. People were changing the environment to derive money not realizing how big their impact on the planet already is. Nowadays the climate change, Polar Sea ice loss and the other environmental problems lead to the question: “How to make the modern economy act in a sustainable way?” The World Commission on Environment and Development (1987) defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

Braungart et al. (2007) consider eco-effectiveness as a tool integrating environmental, social and economic benefits. Eco-effectiveness is

explained as a “transformation of products and their associated material flow such that they form a supportive relationship with ecological systems and future economic growth”.

Sustainability in the modern science is a three dimensional concept because it is concerned with the interests of economy, society and environment (Sartorius and Zundel, 2005). The economy is overrepresented now so society tries to use its power to increase the social responsibility level of the corporations. These efforts made organizations develop their business in a more environmentally friendly way. However, a financial issue arises here: whether it is profitable to act sustainable or not. Some years ago organisations considered taking care about the environment while producing and the costs associated with the environmentally friendly production as investments that give no financial return. It was perceived as a win-lose situation: organisations loose, environment wins. Nowadays the situation is fostered to be seen as win-win. In other words, “green” production could be more financially beneficial. However, a number of studies found a positive correlation between environmental and financial performance (Porter and van der Linde (1995), Shrivastava (1995), Konar and Cohen (2001), etc.).

On the one hand, surveys show that customers are prepared to pay more for “green” products (greenbiz.com, hgtvpro.com) so organizations can get an additional income through the enhanced public image leading to higher sales, and cost reduction. For as far as the stakeholders support the idea of green image the companies showing commitment to environmental issues can gain market share. Such companies get a competitive advantage. Consumers would differentiate environmentally friendly products from the bad ones (also through various eco-certificates), so the producers can get a higher margin with these goods. Organizations that look forward and go beyond existing environmental regulations could realize a first mover advantage. Good image allows attracting a better staff because people are willing to work for the respectable companies.



The three pillars of sustainable development, from left to right, the theory, the reality and the change needed to better balance the model

Figure 1.1. Visual representation of sustainable development (IUCN Programme, 2004)

Cost savings should be included in the benefits of acting environmentally friendly. These cost savings can be reached through reduced consumption of input resources (energy, materials and etc.) or reducing potential costs of abatement of possible emergencies. Companies deeply involved in environmental technology development can create industry standards which are difficult to copy. Hence, it they be considered as a competitive advantage. Acting in a sustainable way is used also to decrease the risk level of regulation tightening. It makes the risk perception lower and can reduce the costs of capital. However, it is clear that organizations cannot perpetually increase the amount of activities showing their environmental commitment, and still expect gains on it. After a certain level of expenses sustainability concerns do not pay off any more (Schaltegger and Burritt, 2000).

“Profitability” of sustainable behaviour could be also related to the time dimension. Normally investments in “green” technologies are big so it is difficult to get a return in the short run. On the contrary, organizations that strive for an environmentally friendly image perform better in the long run.

On the other hand, a lot of studies found that there is no correlation at all between environmental and financial performance (Zhang and Stern (2007), etc.) or did not report a clear view (Hart and Ahuja, 1996). Financial performance is influenced by many factors so it is very difficult to define the weight of environmental performance in financial performance’s change. There is also an option that environmental and financial performances are not strongly related but there is a spurious component that influences both variables (Schaltegger and Synnestvedt, 2002). For example, more innovative companies normally are more active in sustainable development and have higher financial results (King and Lenox, 2001).

Innovation is normally considered as a force fostering sustainability. New technologies are supposed to lead to a higher eco-efficiency which means that development of technology helps to reduce the usage of energy, materials, decrease waste and etc. Sustainable innovation is seen as a sign of commitment to the triple P bottom line (Bos-Brouwers, 2009) proposed by Elkington (1994) – people, profit and planet.

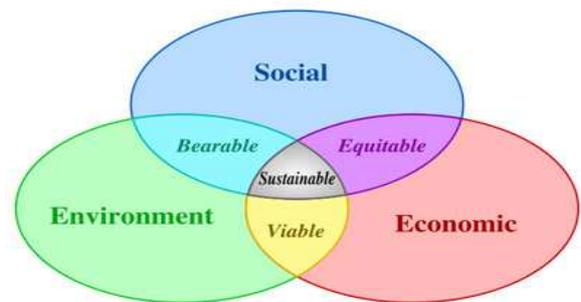


Figure 1.2. Triple bottom line concept (Adams, 2006)

Innovation is closely related to strategy. Miles et al. (1978) made a distinction between prospectors and defenders. For as far as prospectors are innovators they seem to tend to opt for an explorative innovation. Prospectors whose focus is efficiency have a better fit with exploitative innovation strategy, which is based on existing knowledge and hence is less risky. For as far as prospectors have more developed innovation capabilities they emphasize product innovation more than defenders who are tending to accept process innovation instead (Laforet, 2008).

However, the strategy of the company is also linked to sustainability. Theoretically, prospectors seem to be very appropriate to fit in the sustainability concept. Miles and Snow’s (1978) prospectors are close to Porter’s (1985) differentiators in fact. So prospectors having capabilities and flexibility for innovation and design of new differentiated products seem to adopt the sustainability concept. Defenders are not supposed to act sustainable immediately but when they realize the benefits or necessity of sustainable acting they will opt for a “green” image also (Aragon-Correa, 1998). Hence, following any strategy the organizations are coming to environmentally friendly existence sooner or later but in case of prospectors sooner compared to defenders.

1.2. Problem definition

The prior research about the relation between firm strategic orientation, innovation, sustainability and financial performance did not give a clear answer whether environmental performance is really re-

lated to financial performance or not. And if they are related, whether this relation is positive or negative.

Most studies show a positive relation but positive correlation. However, this positive relation can be spurious and caused by extraneous variables like innovation strategy, general corporate strategy or any other factors. Hence, it should be further studied how the positive linkage between environmental and financial performance is explained. It is also important to identify through which pathways a positive relation is reached and how these pathways are connected to the company's strategy and innovation.

1.3. Research objective

The goal of the research is to explore the relationship between firm strategic orientation, innovation and environmental performance, as well as explore the causal effects of the firm's environmental performance on financial performance by studying the existing literature about the identified relationships between the concepts.

The research model is given in the next sub-paragraph.

1.4. Research model



Figure 1.3. The research model

The research model shows that the main focus of the research is to investigate the relation between environmental and financial performance. However, the linkage between innovation and strategic orientation is also supposed to be studied for as far as these firm characteristics can contribute to the explanation of the environmental performance – financial performance link. However, financial performance itself can influence all the other elements of research model: normally the organizations performing well financially have more resources available to innovate and to take care of sustainability. In the end, financial performance affects the strategic orientation. Depending on the financial performance, the strategy can be continued, adjusted, changed, etc.

Actually, the model consists of two parts. The first part investigates the innovation-strategy-sustainability relationship triangle. The second part focuses specifically on the environmental performance- financial performance link.

1.5. Research questions

The general research question is:

What is already known about a relationship between environmental performance and financial performance and mediating variables like innovation and corporate strategy?

To answer the main question the following sub-questions should be answered first:

- 1) How can environmental performance, innovation, strategy and sustainability be defined?

- 2) How can environmental performance be measured?
- 3) What is already known about the relation between environmental and financial performance?
- 4) What is already known about the relationship between innovative orientation and strategic orientation of the organisation?
- 5) What is already known about the relation between organisational strategy and environmental performance?

1.6. Concepts definition

“Environmental performance measures how successful a firm is in reducing and minimizing its impact on the environment, often relative to some industry average or peer group” (Klassen and McLaughlin, 1996).

“Financial performance is a company’s financial viability or the extent to which a company achieves its economic goals” (Venkatraman and Ramanujam, 1986, p.803).

“Innovation involves the conversion of new knowledge into a new product, process or service and the putting of this new product, process or service into use, either via the market place or by other processes of delivery” (G.Johnson et al., 2008, p.325).

“Open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology” (Chesbrough, 2003, p. xxiv).

Closed innovation assumes that the new ideas are developed under the strict control within the borders of organization (Chesbrough, 2003).

“Strategy is the direction and scope of an organization over the long term, which achieves advantage in a changing environment through its configuration of recourses and competencies with the aim of fulfilling stakeholders’ expectations” (G.Johnson et al., 2008, p.3).

1.7. Research outline

Chapter 2 presents the literature study on how environmental performance can be measured. It includes the measurement approaches adopted by various studies investigating the economic aspects of environmental performance level. The chapter also provides an overview of environmental performance measurement techniques developed within the borders of environmental standards such as ISO 14031, EMAS, GRI.

Chapter 3 aims to examine the relation between environmental and financial performance. Three possibilities are discussed there: negative, neutral and positive relation. Moreover, what is more important, the study also investigates the pathways to exercise these relations. The effects of such variables as industry and size are taken into account within the chapter.

Chapter 4 deals with the relation between innovative and strategic orientation. Strategic orientation is based on Porter’s (1985) generic strategies and Miles and Snow’s (1978) theory. The innovative orientation distinguishes between product/process/market innovation, open/closed innovation and explorative/exploitative innovative orientation.

Chapter 5 is dedicated to the relation between organisation’s strategic orientation and environmental performance with an environmental strategy as a mediating variable. The chapter also deals with a problem of corporate strategy – environmental strategy alignment and integration.

Discussion and conclusion are presented in Chapter 6.

Chapter 2.

2. Measuring environmental performance

2.1. Introduction

Nowadays a lot of studies are done aiming to link financial and environmental performance and investigating the nature of this interconnection (Klassen and McLaughlin (1996), Jaggi and Freedman (1992), Fogler and Nutt (1975), etc.). Some scientists suppose that there is a direct link between environmental and financial performance while others propose that this relation is spurious and can be exercised through the existence of extraneous components as strategy or innovation (Porter and van der Linde (1995), Schaltegger and Synnestvedt (2002), etc.). There is not clear answer on whether environmental performance affects financial performance positively, negatively or whether there is no effect at all. The studies use different ways to measure environmental performance. Not only various indicators but also various approaches are used. Hence, this chapter aims to provide an insight into the existing literature on the subject. First, the overview of indicators used by different studies is provided. Then the regulation related to environmental performance is investigated. So this chapter is focused specifically on environmental performance measurement as a part of the research model (Figure 2.1).



Figure 2.1. The research model. Focus of Chapter 2.

2.2. From environmental management to environmental performance measurement

Many studies attempted to develop a scientific approach to explain the environmental activities of organizations. Actually, two directions can be distinguished here: one is more focused on environmental management (as a policy) and the other one on environmental performance as a measure (Kolk and Mauser, 2002). Environmental management models cannot really be a tool to measure the environmental performance – they are too difficult to operationalise. They can be used for academic purposes or for management’s decision making. The whole set of environmental management models is dominated by continuum and typology models. However, Kolk and Mauser (2002), referring to Doty and Glick (1994) definitions, emphasize that continuum models¹ are not always applicable and quite unreal because they attempt to simplify reality by breaking the environmental path of organization into the sequence of mutually exclusive steps. Typologies are assumed to be better in displaying the reality.

An integrated model from the many studies to explain environmental activities of firms is provided by natural – recourse – based view of the firm developed by L. Hart (1995). It is one of the most frequently mentioned works from literature on the topic. The classic resource – based view emphasizes the distinctive strategic capabilities as a key to the competitive advantage and superior performance (G. Jonson et al., 2008). Hart (1995) goes beyond the “capabilities view”. He identifies constraints and challenges posed by the present state of ecosystems as a cornerstone of his theory. Environmental com-

¹ Based on the Doty and Glick’s (1994), Kolk and Mauser (2002) define continuum models as “systems that categorize phenomena into mutually exclusive and exhaustive sets with a series of discrete decision rules”.

mitment is seen as a rare firm specific resource. So “green” production can be viewed as a strategic capability according to the Hart’s theory. Three strategies of environmental behaviour are distinguished: pollution prevention, product stewardship and sustainable development. Figure 2.1 graphically presents these strategies and also the relations between them as identified by Hart (1995). Interconnectedness of these strategies means that they are path dependent, embedded and overlapping. In the process from pollution prevention to sustainable development it is assumed that the level of environmental commitment increases also. Moreover, the company’s ability to perform well in a next stage is determined by its capabilities developed on the previous one. It is better not only to come one step after another but to profit from the synergy which is realised from the simultaneous exercising of several strategies (for example, pollution prevention and product stewardship together).

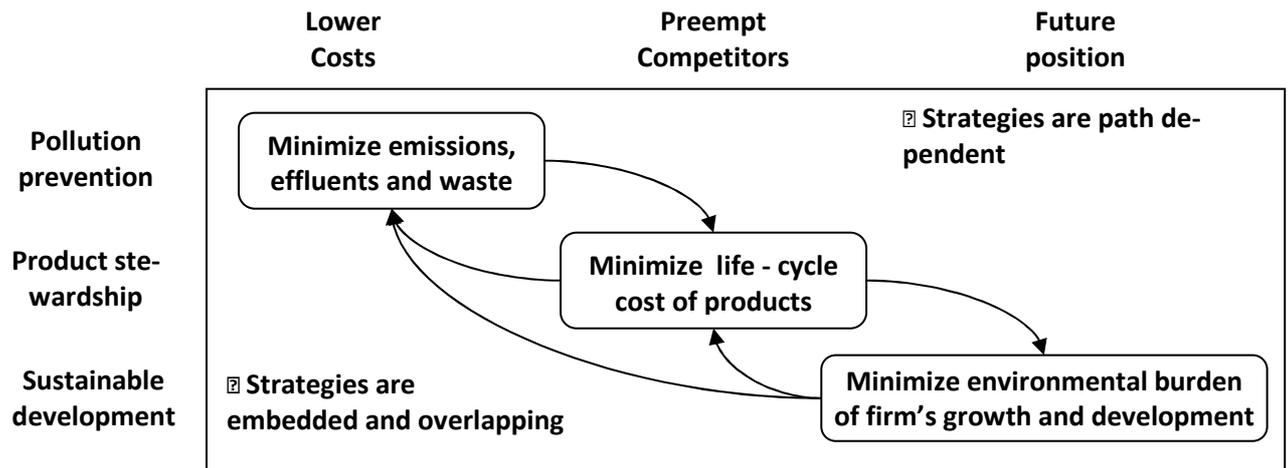


Figure 2.2. Interconnectedness (Hart (1995), p. 1005)

Kolk and Mauser (2002) define Hart’s model as a continuum. However, this is questionable. According to Kolk and Mauser’s (2002) understanding of a continuum, it represents the set of stages which are supposed to be performed one by one WITHOUT an overlap. Actually, this requirement is crucial. On the contrary, Hart (1995) emphasizes that a simultaneous implementation of proposed strategies can not only exist but also to create additional synergy.

Inspired by Hart, Russo and Fouts (1997) come up with two models of environmental policy – the “end of pipe approach” and a “prevention policy” focused on source reduction and process innovation. They assume that organisations can derive different profit levels depending on what kind of environmental policy is adopted. Russo and Fouts’ (1997) proposal simplifies the reality a little bit as far as it does not provide the opportunity for these strategies to overlap.

2.3. What is already known about environmental performance measurement from the various studies

Jasch (2000) comes up with the main purposes environmental indicators should serve:

1. historical and other forms of benchmarking
2. finding out possible market gains and costs savings
3. stressing optimization potential
4. derivation and pursuit of environmental target
5. communication tool of environmental reports
6. feedback instrument for information and motivation of the workforce

Ilinitch et al. (1998) aggregated the results of the previous studies of Wood (1991) and Lober (1996) into the matrix below (Figure 2.2). They state that all the environmental performance indicators can be assigned to any of 4 dimensions of the matrix. The approaches of Wood (1991) and Lober (1996) can be

combined together due to their similarity. However, Wood (1991) talks about corporate social performance in general, while Lober (1996) is focused specifically on environmental performance.

| | Internal | External |
|----------------|------------------------|-----------------------|
| Process | Organizational systems | Stakeholder relations |
| Outcome | Regulatory compliance | Environmental Impacts |

Figure 2.3. A corporate environmental performance matrix (Ilinitch et al. (1998), p.388)

Ilinitch et al. (1998) assume that all the environmental indicators can be put in 4 groups distinguished based on two dimensions: process/outcome dimensions versus internal/external environmental processes.

Internal system measures reflect the level to which an organisational system is designed to enhance the environmental performance. The category includes environmental audit programmes, environmental mission statement, etc. External stakeholder relation describes interaction with the various companies' stakeholders and evaluates such aspects as corporate philanthropy, relations with government, with local communities, etc. Environmental impacts aim to deal with externalities generated by company's functioning. Many studies use for example Toxic Release Inventory (TRI) as a measure of environmental performance reflecting the environmental impact such as water, ground, air and other forms of pollution. TRI is provided by American corporations. Internal environmental compliance corresponds to how the company meets minimal regulation requirements. However, indicators belonging to this group are difficult to interpret. They depend on the industry, costs of compliance and etc.

Commenting on the scheme of Ilinitch et al. (1998), Kolk and Mauser (2002) notice that process indicators refer to more qualitative aspects such as audits, mission statement and communications while process indicators tend more to have quantitative nature – spills, penalties, and etc. Finally they come up with their own classification of environment performance evaluation. They discern three groups – environmental management indicators (to evaluate the commitment of management to environmentally friendly activities), environmental condition indicators (the state of environment on the local, regional, national and international level) and environmental performance indicators. For sure we are especially interested in the last group which includes:

- Environmental operational indicators – include specific actions linked to such areas as maintenance supply, production etc.
- Environmental impact indicators – outputs such as emission, waste, energy and material usage.

However, the explanation Kolk and Mauser (2002) provided for the classification is not very clear. For example, environmental impact indicators are defined as output but the given example is energy and material usage, which is obviously input. It could be related to the output in a sense that the more material organization uses, the more the environmental impact is. Nevertheless, it is not very clear from the article from what perspective the problem should be seen.

By Haverkamp et al. (2010), environmental performance is perceived as a managerial performance (governance of environmental impact). It can be examined at three levels: operational, organizational and strategic. The study itself attempted to measure environmental management capabilities dividing them into strategic, operational and chain oriented capabilities. Strategic capabilities are related to the formulation of environmental strategy and action programme. Operational – to the organisation of activities aiming to measure the environmental impact (information collection to check environmental emissions e.g.) and to evaluate the actions companies conduct to enhance environmental performance (environmental training of employee e.g.). Chain oriented capabilities are measured through the availability of data collected about the environmental cooperation in the chain (data collected to exchange with buyers/suppliers e.g.)

Bremmers (2005) went beyond and developed a matrix where all the indicators can be put depending on the managerial focus level they assume and the breadth of environmental involvement they require (Figure 2.3). However, the further the company goes through the path of sustainability (from the

good housekeeping measures to environmental image management), the more expensive it becomes and more changes requires (Walley and Whitehead, 1994). Taking into account the fact that nowadays the scientists emphasize the importance of chain cooperation in sustainable development, the focus is moving from the bottom to the top of the scheme (Figure 2.3). For example, Handfield et al. (2002) classified environmental impact of organisations as direct or indirect. Direct impact is actually related to the waste stream from the new purchased items which increases the waste stream that the particular company normally generates. Indirect impact concept goes one step further through the chain. It proposes to take into account the waste flows generated with the production of these purchased items.

Breadth of environmental involvement

| | | | |
|---------------------|--|---|--|
| <i>Network</i> | Branchwide process innovation | Public-private agreements on environmental management practice | Environmental image management |
| <i>Supply chain</i> | Tracking and tracing of causes of environmental impact | Coordination with suppliers and / or buyers of environmental action | Life cycle assessment and management |
| <i>In-company</i> | Good housekeeping measures | Functional integration of environmental management | Renewal of machinery, environmental marketing strategy |
| | <i>Operational</i> | <i>Organizational</i> | <i>Strategic</i> |
| | | | Managerial focus |

Figure 2.4. Managerial attention to environmental performance (Bremmers et al., 2005)

A very interesting approach to environmental indicators classification is proposed by European Environmental agency (1999) – the DPSIR framework of reporting on environmental issues.

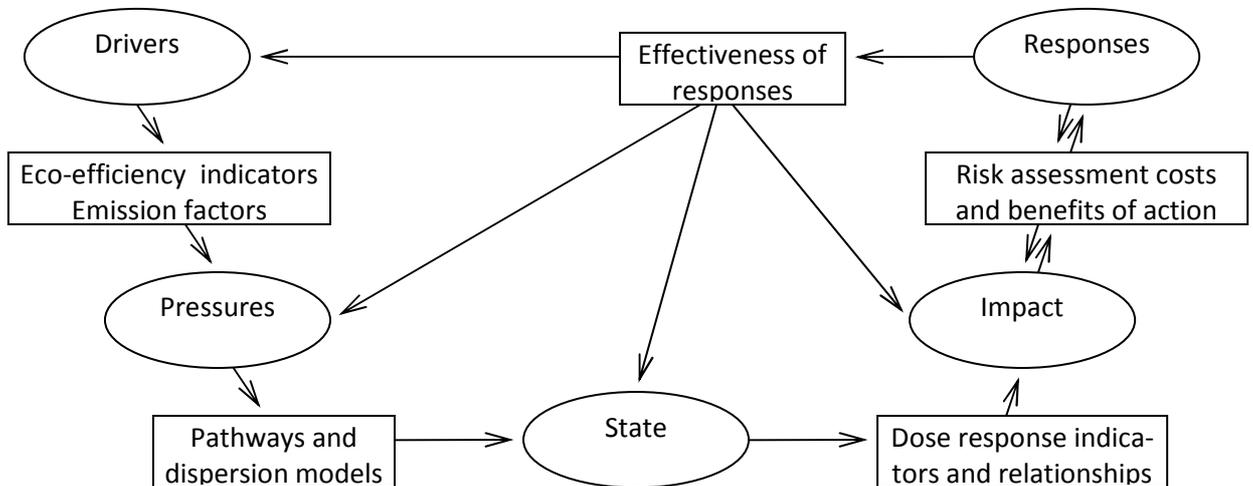


Figure 2.5. Indicators and information linking DPSIR elements (Technical report N25 of European Environmental agency, 1999)

DPSIR scheme is built on the Profit-People-Planet approach. According to the scheme, drivers (such as social and economic development) put the pressure on the environment and change its present state. The arising environmental issues have an impact on society (creating bad conditions for life) and economics (scarcity of resources) as well. Hence, society responds to the influence of all the above mentioned elements (impact, state, pressure, drivers) to change them either via adaptation or curative action. So it is stated that there is a need in indicators to trace the state of all the 5 elements. The scheme shows how these elements are connected, as well as the concepts which link them.

Azzone et al. (1996) distinguish among four groups of EPIs: the state of environment, corporate environmental policy, environmental management systems and products and processes of the company considered through the framework of ecobalance. To explain the ecobalance White and Wagner's (1994) definition is used: "ecobalance is a structural method for reporting the physical inflows and outflows of resources, raw materials, energy, products and wastes occurring in a particular organisation during a specified period of time". Ecobalance is presented like a complex concept including:

- company ecobalance – the inflow and outflow of materials and energy within the company for one year
- product ecobalance - the inflow and outflow of materials and energy of particular product lines
- process ecobalance - the inflow and outflow of materials and energy used for specific process.

The concept of ecobalance plays an important role as it is tightly embedded in the Azzone's et al. (1996) way of reasoning. The key point here is the environmental policy of the firm. Environmental policy is defined by qualitative indicators representative managers' opinion about strategic and environmental orientation. A list of 21 issues is presented to be included in the environmental policy: waste minimisation, environmental training, public disclosure and etc.

Operational activity of the company affects the environment. So the group of "state of the environment" indicators aims to reflect this impact. There are four areas covered by this group:

- emissions - quantities of CO₂, CO, NH₃, etc. emitted
- waste – total amount of non-hazardous waste generated, total amount of hazardous waste generated etc.
- energy – total amount of energy consumption, consumption by types: gas, electricity, etc.
- transportation – number of transportation means /or distances

These areas are supposed to be covered by mostly physical indexes - measured by quantitative scale but not related to economic parameters.

Environmental policy affects Environmental Management System (EMS) implementation in a firm. Azzone et al. (1996) state that EMS is based on the three basic aspects: commitment to environmental problems, compliance with environmental legislation and stakeholders' satisfaction. So, taking into account this wide range of aspects that EMS-indicators must reflect, both quantitative (economic and physical and) and qualitative indicators should be used. So to measure commitment all the three groups should be used: physical (number and frequency of environmental audits e.g.), economic (an assessment of the amount of monetary resources allocated to environmental projects e.g.) and qualitative (an assessment of the explicit commitment of the top management e.g.). Only physical (number of environmental incidents e.g.) and economic indicators (environmental fines and liabilities e.g.) are proposed for compliance. Stakeholders satisfaction should be described with qualitative (inquiries to suppliers, customers and etc. e.g.) and physical indicators (number of accusations e.g.). The last group mentioned by Azzone et al. (1996) to be affected by environmental policy is product and process environmental performance. The input-stock-output scheme is given for it. The input assumes resources such as land, water, air, etc. Stock assumes such categories as product related goods, plant and equipment, etc. Outputs of the firm can be presented by water waste, air emissions, energy emissions, etc. Physical and qualitative indicators can be used to measure all the dimensions of product and process environmental performance.

Table 2.1. provides an overview of approaches and indicators used by recent studies to measure the environmental performance.

For measuring environmental performance King and Lenox (2001) propose to take into account the importance of industry while measuring environmental performance and point out the relative performance within an industry and the average industry performance.

Klassen and Whybark (1999) state that as far as a lot of measures (such as environmental regulatory compliance, costs of this compliance, etc.) were historically designed for "dirty" industries the results of these studies should be accepted carefully.

| Study | Study content | Environmental performance measure |
|----------------------------------|--|---|
| Haverkamp, Bremmers, Omta (2010) | What environmental capabilities are coming from institutional and network drivers and whether they are able to enhance environmental performance | Development of environmental management capabilities: strategic, operational and chain oriented |
| Daniel Tyteca (1996) | Working out environmental performance indicators based on the theory of production efficiency which enable to compare the environmental impact between and within (in time) decision making units | Comparing the input, desirable production outputs and undesirable pollution outputs, |
| King and Lenox (2001) | Does it pay to be “green“? | <ul style="list-style-type: none"> • total emissions - the log of total facility emissions of toxic chemicals • relative emissions (the firms ability to manage and reduced its pollution compared to other companies in the industry) • industry emissions (the extant to which the company tends to operate in the “dirtier” industries) |
| Bremmers, Haverkamp Omta (2005) | Getting inside in the relationship between the managerial attitude towards sustainability issues, subjective norms and perceived behavioural control which are combined into the managerial intentions leading to the certain behaviour which corresponds to the certain environmental performance | ISO 14001 (environmental auditing, education of personnel, measurement of pollution on a regular basis etc. |
| Klassen and McLaughlin (1996) | Investigating the impact of environmental management on firm performance | Positive environmental event, specifically the announcement by an independent third party of winning an environmental award |
| Russo, Fouts (1997) | Spotlighting environmental performance – economic performance relationship assuming growth as its moderator | Independent environmental ratings given by the Franklin Research and Development Corporation (FRDC) based on compliance records, expenditures, and other initiatives used to meet new demands, to reduce waste reduction, and to support environmental protection organizations. |
| Klassen, Whybark (1999) | Investigating the impact of composition of the plant’s environmental technology portfolio on the manufacturing and environmental performance | Toxic release Inventory (TRI) |
| Jung, Kim and Rhee (2001) | Investigating environmental performance – efficiency link in the oil industry | G-score including five categories: general environmental management, input, process, output, and outcome |
| B.H. Spicer (1978) | Investigating the relation between corporate social responsibility and corporate performance | The level of pollution control expenditures |

Table 2.1. Environmental performance measure used in the studies investigating environmental performance – financial performance relation

2.4. Environmental performance measurement and environmental standards

Regulatory compliance is one of the most important drivers for environmentally friendly behaviour (Williamson et al. (2006), Bansal and Roth (2000), etc.). Henriques and Sadorsky (1996) come up with two main reasons why governmental environmental regulation is necessary: imperfect information and externalities. They define externalities as costs (like pollution damage) during production of goods or services which are incurred due to the existence of environmental regulation. Imperfect information is mainly related to the customers who receive it. Based on a wrong perception of risk they are not able to make a correct decision.

ISO 14031 Environmental Performance Evaluation (EPE) defines environmental performance evaluation as “an internal process and management tool designed to provide management with reliable and verifiable information on an ongoing basis to determine whether an organization’s environmental performance is meeting the criteria set by the management of the organization”.

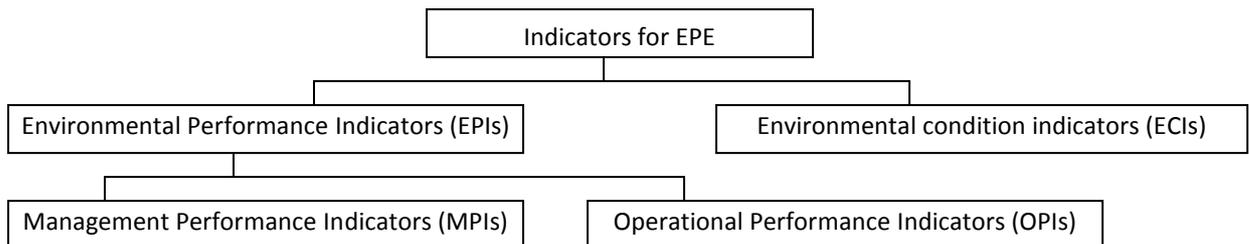


Figure 2.6. Types of environmental performance indicators according to ISO 14031

EPIs are divided into MPIs and OPIs. MPIs reflect the efforts of managers to influence environmental performance. “MPIs relate related to the policy, people, practices, procedures, decisions and actions at all the levels of organisation”. Jasch (2000) comes up with the following examples of these indicators: degree of compliance with regulation, number of sites with environmental reports, number of environmental audits undertaken, return on investment for environmental improvements project and etc. It is also mentioned that MPIs can be better used for “quantification of environmental management targets”.

OPI characterise the level of environmental commitment in the operational activities of the organization. So it’s actually related to the organisation itself and how its processes affect the environment. Possible examples are the quantity of water per unit of product, total land area used for production purposes, duration of product use quantity of specific emissions per year, noise etc.

Jasch (2000) subdivides OPIs into energy and mass indicators. Emblemvåg and Bras (2000) comment that they measure material and energy efficiency and propose Cunningham’s (1994) waste index as an example. It represents just a ratio of material waste (undesired usage) resulting from the process and the total amount of material used in the process.

Environmental condition indicators reflect the state of the environment and its pollution level. Normally it’s not a matter of the one particular company – one company normally cannot influence the state of environment so much. So environmental condition indicators are mostly measured and applied by certain organizations or institutions. Examples are change in groundwater level or population of the specific animal species within a defined area.

The standard provides the EPE model as well. It is based on 4 steps: Plan-Do-Check-Act (PDCA). In fact, PDCA was developed by Deming and called after him “Deming cycle”.

1. Plan – assumes planning EPE. The important issue here is selecting corresponding indicators. Emblemvåg and Bras add that it’s possible to pick as already existing indicators as develop the new ones.

2. Do – includes the sequence of steps to develop and use data sets: collecting, analysing and converting data, information evaluation and reporting and communication.

3. Check and act means reviewing information and acting based on the logical implication on the review (for example, actions undertaken to correct the results)

Emblemsvag and Bras (2000) notice a drawback of ISO 14031 in a huge variety of indicators offered by the standard. They argue that the fact that organisations can choose themselves what indicators best reflect their activity can violate the comparability of results.

Jasch (2000) notices that the ISO 14031 does not assume so much written procedures and documentation; so it is easier to follow and especially convenient for small and medium sized companies.

The EU Eco-Management and Audit Scheme (EMAS) is a management tool for companies and other organisations to evaluate, report and improve their environmental performance. Nowadays EMAS II determines the rules of EMAS logo obtaining. However, the new regulation EMAS III is expected by 2010.

EMAS cooperates with ISO. Compliance with ISO 14001 is necessary to be accepted by EMAS.

The procedure of EMAS registration includes several steps (Jasch, 2000):

- environmental review – “a method including the check of the relevant data of environmental aspects and impacts², legal requirements and organisation of environmental protection”;
- environmental management system (EMS) establishing;
- environmental audit conducting;
- providing the statement of environmental performance.

All these stages must be approved by an accredited EMAS verifier. The publicly announced proof is the last step to EMAS logo.³

Nevertheless, neither ISO 14031 nor EMAS point exactly what kind of data should be collected, the scope of the data and methods of data evaluation.

There is a number of organizations promoting sustainable development such as GRI, WBCSD, IOSD. One of the best known is GRI. The Global Reporting Initiative (GRI) is a network-based organization that has pioneered the development of the world's most widely used sustainability reporting framework and is committed to its continuous improvement and application worldwide. That's how GRI defines itself. It was founded in 1997 by Coalition for Environmentally Responsible Economies (CERES). The corner stone of GRI is a reporting framework which is developed through the communication with stakeholders from more than 60 countries.

GRI emphasizes the main benefits of volunteer environmental reporting, such as:

1. showing commitment to sustainability issue
2. environmental reporting give opportunity for benchmarking at different levels (historic, industry, etc.)
3. GRI promoting environmental reporting stimulate demand for it. Thus company using GRI automatically gain

The guidelines developed by GRI include information aiming to help the organisations with reporting. It includes the requirements to the report content, quality, identifying its boundaries, information related to the organisation itself (strategy, governance, general information etc.) There are also some comments about the sector and country report adjustment.

GRI more provides more than 100 indicators - generally applicable (total energy, waste and water use, greenhouse gas emissions in tons of CO₂ equivalent and etc.) and organization-specific (the use of recycled material, packaging materials, and water sources significantly affected by the organization's use of water). They are not obliged to be used. Moreover, organization chooses itself which indicators to use, how many indicators to use how to use them (Veleneva et al., 2003).

² EMAS makes a certification decision based on the following indicators: raw material, energy and water consumption, total waste, waste qualities waste water and air emissions

³ <http://ec.europa.eu/> 17.10.2009

However, comparing with ISO, GRI can be characterised more by strong product orientation than process control orientation⁴

2.5. Conclusion

To sum everything up, the chapter investigates the approaches to environmental performance measurement adopted by various studies and environmental standards.

While measuring the environmental performance, the studies investigated within the present chapter focus either on environmental management systems as a policy or directly environmental performance measurement. The disadvantage of environmental management models is that they are difficult to operationalise. They mostly present a set of possible environmental strategies which companies can follow - with or without an overlap.

The indicators for environmental performance measurement used in recent studies are very diverse. The most integrated scheme of environmental performance measurement is provided by Bremmers et al. (2005). They define 9 groups of environmental performance indicators depending on the level of managerial focus and breadth of environmental involvement. We try to integrate all the approaches to environmental performance measurement investigated in the present chapter with the help of Bremmers et al. (2005) scheme (Figure 2.4). Most of the studies are concentrated in the bottom of the scheme (in-company environmental involvement) from operational to strategic level of managerial focus (Hart (1995), Russo and Fouts (1997), Ilinitch et al. (1998), Azzone et al. (1996), ISO, EMAS). Ilinitch et al. (1998) and Azzone et al. go a little bit further and try to communicate the environmental initiatives and impacts with the stakeholders. They go up (even till the level of network) on the organisational dimension of the scheme. Obviously, there is a lack of environmental performance measurement indicators corresponding to the supply chain or network level.

Anyway, the scheme of Bremmers et al. (2005) and most of the studies prefer while measuring environmental performance to take into account the impact of the single corporations – not the present state of environment. Indeed, the present state of environment is defined normally not by the activity of one organisation but by the whole infrastructure in a particular area. Specific firms are not interested in the state of environment measurement – it is a matter of institutions and etc. It implies that the studies and environmental standards accounting for the state of environment indicators (Kolk and Mauser, 2002) simply do not fit it in the scheme chosen as an integrating framework.

The view on the linkage between environmental and financial performance indicators and its theoretical foundation is presented in the next chapter.

⁴ <http://www.globalreporting.org/> 17.10.2009

Chapter 3.

3. The relation between environmental and financial performance: correlation vs. causation.

3.1. Introduction

While the sustainability issues are becoming “hotter” these days the questions related to financial aspects of environmentally friendly production arises. Companies which invest significant amounts in sustainability want to know whether they should identify it as additional costs or it is possible to derive some return from “green” initiatives. On the one hand, during organizational operational activities the environment is being affected. If the business does not compensate the damage then the society incurs additional costs to neutralise the negative effect of organisations on the environment. In this case, the necessity of environmental investments made by corporations looks “fair” because it transfers the costs of keeping the environment “clean” back from society to organisations. On the other hand, even the existence of environmental regulations cannot completely solve sustainability issues. So there is a need to create stimuli and facilitate companies to go beyond existing regulations by developing the “green” technologies. The improved financial performance as a result of environmental initiatives can become such an incentive. Many studies attempted to link environmental and financial performance. And most of the scientist answered positively the question “does it pay to be green?” The aim of this chapter is to shed some light on the present literature on the subject. The chapter intends not only to investigate the sign of the correlation but what is more important to try to understand what can be a theoretical underpinning of the environmental performance – financial performance link.

Chapter 3 is an essential part of the research as it is shown in the Figure 3.1.



Figure 3.1. The research model. Focus of Chapter 3.

The prior research did not give a clear answer on the relation between environmental and financial performance issues. Nevertheless, the three “schools” has appeared supporting opinions about positive (Chapter 3.2), negative link (Chapter 3.3) and the absence of any link (Chapter 3.4) between the concepts. Cohen et al. (1997) a reason for such different empirical results in the differences among the instruments used to measure environmental performance (see Chapter 1).

3.2. Positive relation between environmental and financial performance

The idea of a positive relation between financial and environmental performance is supported by Porter and van der Linde (1995), Schmidheiny (1992), Shrivastava (1995), Bragdon & Marlin (1972), Spicer (1978), Konar and Cohen (2001) and etc. The phrase of Milton Friedman - a Noble Prize winner - “the social responsibility of business is to increase the profit” uniting these scientists’ works.

Some business representatives support the idea of a win-win situation too. V. Joshi, executive vice president of the Imaging and Printing Group of HP – number one in “green” rating in 2008, says: “The success of HP’s business requires our commitment to environmental sustainability. In a world being reshaped by climate change, volatile energy prices and growing scarcity of natural resources, we are designing our products and services to be energy efficient, use fewer materials and be more easily recyclable. Sustainable design minimizes environmental impact across the entire life cycle while helping our customers to reduce costs, create efficiencies and increase productivity”.⁵

Actually, Porter and van der Linde (1995) were the first who came from understanding the sustainability – profitability relation as a “tradeoff between social benefits and private costs”, to a win-win situation which is called “a dynamic paradigm”. Its base is innovation and innovation is a base of competitive advantage.

In fact, the approach of Porter and van der Linde (1995) is quite specific. To cut a long story short, “properly designed” environmental regulation fosters innovation which implies financial benefits which can reduce the costs of regulation compliance in the worst case and in the best case even make a profit out of it. With this argumentation, Porter and van der Linde (1995) state that the companies do need a regulation and don’t act in a “profitable” sustainable way on their own because of the lack of information. This lack of information does not allow for “right” decision making. Organisations simply don’t know about the existence of profitable options. The companies need regulations because it is admitted that innovation does not always pay off while sustainability should be taken into account anyway. The important issue here is a time scale as well. Porter and van der Linde (1995) study long run effects while the chance that innovations do not give expected returns in the short run is quite high.

Investigating the positive correlation between environmental and financial performance, King and Lenox (2001) present two viewpoints aiming to explain the possibility of positive correlation’s existence. One of them supported by Jaffe et al. (1995) see the root of the problem in the lack of experience or knowledge which does not allow managers to consider the real costs of pollution. Another vision developed by Hart (1995) supposes that environmental capabilities are vital to generate superior performance.

Klassen and McLaughlin (1996) stand for the positive link between environmental and financial performance. Their sample is constructed of 82 companies. In the given sample, the effect of environmental events such as environmental awards announced by independent units on financial performance is measured through the stock return change following the environmental event. Konar and Cohen (2001) criticise this way of measuring environmental performance because it has to deal with “outliers”: not always a good environmental performance is acknowledged with awards as well as the bad environmental performance end up with spills and etc.

Actually, Klassen and McLaughlin (1996) not only try to figure out the presence or absence of an interconnection between environmental and financial performance, but also to explain through which pathways it can be exercised (Figure 3.1). They go beyond the positive correlation they found and look for the causation.

Klassen and McLaughlin (1996) point two main directions through which improved environmental and financial performance can be theoretically linked: market gains and cost savings. Organisations can derive market gains through market share gains. They can be obtained by companies promoting sustainable development - such companies can expect expanding the markets and overperforming competitors who did not prove themselves as the one acting sustainable. Klassen and McLaughlin (1996) state that “green” certification provides organisations a good chance for differentiation. One more path here is a higher product contribution margin.

The advantages of acting in a sustainable way can be also realized through the cost savings. This aspect has several dimensions – from obvious economy on pollution fines to establishing industry standards. Miles and Covin (2000) mention the following potential ways of costs savings:

⁵ www.hp.com. 20.10.2009

- 1) process innovations;
- 2) product quality improvements;
- 3) lower costs of capital due to lower investor and insurer perceived risks;
- 4) lower HRM costs associated with a safer and higher quality/morale work environment;
- 5) lower costs of goods due to minimization of the cost of lost ingredients

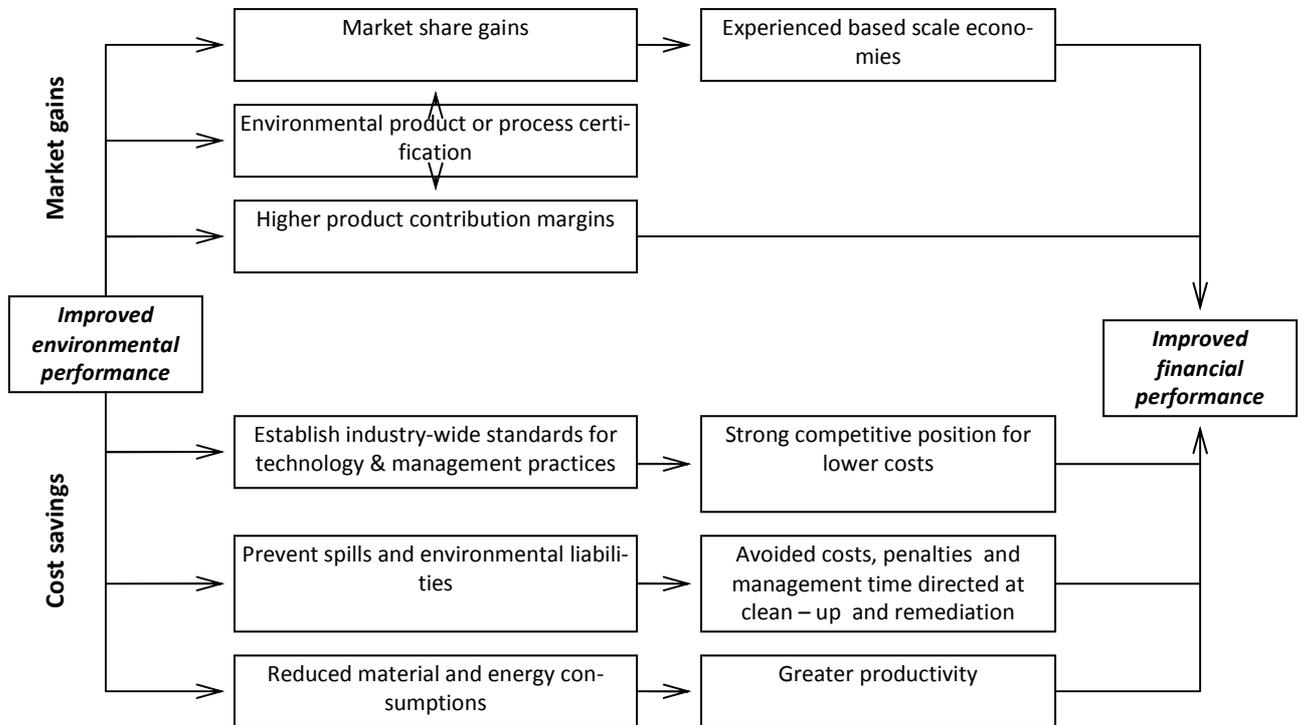


Figure 3.2. Linkage of improved environmental performance to improved financial performance (from Klassen and McLaughlin (1996) p. 1202)

Actually, the scheme (Figure 3.2) of Klassen and McLaughlin (1996) can be bounded with one word – differentiation. While the distinction between market gains and cost savings is just a matter of different types of benefits resulting from differentiation.

Johnson et al. (2008) distinguish among several sub strategies for the generic differentiation strategy identified by Porter (1985):

- 1) Differentiation without price premium – perceived added value by consumer, market share benefits
- 2) Differentiation with price premium – perceived added value is enough to derive a price premium
- 3) Focused differentiation – perceived added value for a segment enabling price premium for this segment
- 4) Hybrid – based on low price with reinvestment in low price and differentiation

The scheme proposed by Klassen and McLaughlin (1996) is based on differentiation as well as the generic Porter’s strategy. Hence they can be integrated in the following way:

- 1) Market share gains can be identified with differentiation without price premium
- 2) Higher product contribution margins – with differentiation with price premium
- 3) Environmental product or process certification – with focused differentiation (segments prepared to pay for “green” product labels extra)
- 4) Cost saving part can be identified with a hybrid since it assumes low cost base and reinvestment in low cost.

Summarising the integration part, the question arises – why then the upper part of the scheme (Figure 3.2) is called “Market gains”? Both cost savings and actions listed below the “Market gains” in the scheme can contribute to market gains. It sounds more logical to call the upper part of the scheme the “income gains” or similar. Moreover, both parts can be united with the title “market gains through different types of differentiation”.

Regarding the differentiation, nowadays a new approach is arising. Some big companies do not position their products as “green” while manufacturing them in an environmentally friendly way. The reason for such a strange (at least from the first side) behaviour is quite simple. These organizations just do not want to risk their image. The problem is that if the company creates a strong environmental reputation it has to maintain it. Imagine that mass media suddenly find out that in some far and small branch of company things are not as perfect as it is announced. In this case the company can lose its reputation. Hence, some companies now prefer not to promote a “green” image at all. They produce in a sustainable way but announce and emphasize only the high quality of their goods. In fact, it is easier to sell a “green” label when there is some more added value – for example, the quality or the price. So this approach seems to be reasonable.

The issue of quality-environment interconnection is reflected in the concept of “total quality environmental management” (TQEM) which considers quality and environmental issues as interrelated concepts. Miles and Russell (1987) define TQEM as “an extension of TQM, explicitly taking into consideration environmental issues and costs pertaining to the production, consumption, and the ultimate disposition of the product, its packaging, and related by-products”. Borri and Bocaletti (1995) suggest that the better the quality is, the better environmental performance is, and vice versa. The environmental care is presented as a dimension of quality. According to Borri and Bocaletti (1995), quality systems and environmental management systems are parallel and correlated. The parallelism is explained by the similar goals for both systems such as internal cost reduction or market share gains. Nevertheless, the goals with the same content mean different things in practice. For example, for quality purposes the internal costs reduction means a decrease of reject and reworks amount. While managing environmental problems it means decreasing the input (material, energy, etc.) usage and the reduction of costs arising from environmental impact of products. Both, “green” production and quality have the potential to improve customer’s satisfaction and increasing value.

Positive environmental image can be also important for employing better personnel because people tend to opt for companies with a good image. Sustainable development is also one of the dimensions of the corporate social responsibility. Hence, a potential employee can expect a good care about personal in the companies with “green” image.

Waddock and Graves (1997) try to explain the existence of the positive link by presuming that a good management strives for good relations with stakeholders, which in turn motivates managers to undertake environmental initiatives. They presume that a good stakeholders’ impression of the company can increase sales and reduce the costs of stakeholder management.

Christmann (2000) focuses the study mainly on the cost side of the problem – the effect of the implementation of environmental management best practices on the organisational competitive cost advantage. It is stated that best practices can stimulate cost advantages from reducing the input and waste disposal costs. However, the role of environmental regulation is emphasized – it differs in many countries so it generates different opportunities for cost savings as well. Christmann (2000) also considers that differentiation of eco-products allows for higher prices and implies higher revenues. Hence, best environmental practices have a potential to gain from both sides.

It should be taken into account that environmental investments are mostly long run. So if the managers are striving for current profit optimization or even if their vision is limited with the nearest future horizon there are not enough incentives to foster environmental investments. It implies that the role of environmental regulation is difficult to underestimate in this case. Indeed, environmental initiatives can pay back. But when? Short run financial motives to go “green” do not work so well. Hence, environmental regulation is very important to motivate managers to account for the environment.

Christmann (2000) not only assumes the relation between best environmental management practices and cost advantages. The study considers the moderating variables such as complementary assets as a cornerstone to understand the mature of environmental performance – financial performance relation. “Complementary assets” are defined by Teece (1986) as “resources or capabilities that allow firms to capture the profits associated with a strategy, technology, or innovation” are introduced as the moderating variable defining the economic success of environmental management implementation. It is also highlighted that complementary assets are rare and firm specific and to the certain extent can become a barrier for the imitators. The author adds that there is a lack of empirical data explaining the concept. The complementary assets were mainly considered as firm’s innovativeness during the study. So Christmann (2000) joins the group of scientists supporting the idea of a positive effect of environmental initiatives on profitability but emphasizing the existence of extraneous variables affecting this link.

Sustainable production can not only cause but also reduce the business risk. For example, using renewable energy sourcing can be good for companies that are exposed to abrupt material price changes, like fuel price changes. With renewable sources organizations can hedge such risks⁶. Risk reduction can also decrease the costs of capital which results in additional financial gains.

The innovative companies going beyond existing regulations can expect first (early) mover advantages. Porter and Van de Linde (1995) identify two possible gains: price premium for eco-products and new market segments. The modern theory of management mentions even more potential advantages: experience curve benefits, scale benefits, pre-emption of scarce resources, enhanced reputation and buyer switching costs (Johnson et al., 2008). Hart (1995) defines competitive pre-emption as “gaining a preferred or exclusive access to important but limited resources” or “establishing rules, regulations and standards that are uniquely tailored to the firm’s capacity”. According to Lieberman and Montgomery’s (1988) model, with the help of mechanisms enhancing the amplitude and duration of these advantages, organizations can gain an even a higher profit.

First movers can expect a positive effect on their image by identifying themselves as the first one who opts for environment. However, there are also late mover advantages such as learning and free riding (Montgomery and Lieberman, 1988). To respond, first movers patent the inventions, pre-empt resources and etc.

If a company go beyond existing environmental regulations in its sustainable development its activity can “inspire” new “green” standards or regulations. So pioneers are prepared and do not incur any additional significant costs compared to competitors who have to follow the same path but later, and on a more extensive basis (Hart, 1995).

Waddock and Graves (1997) use a stakeholder analysis to explain the positive relation between environmental performance and financial performance. First they distinguish between explicit (payments to bondholder e.g.) and implicit costs (environmental costs). The idea is that if the company lowers its implicit costs - does not act environmental friendly for example – then explicit costs increase, leading to competitive disadvantage.

King and Lenox (2001) emphasise the importance of public relations quality while communicative environmental image. It is stated that companies with a good external communication are able even to “put a positive spin on negative news”.

McDonough and Braungart (1998) state that industry should learn from nature how to produce. The situation when making a product is accompanied with the processes disturbing the natural state of environment (creating waste, using exhaustible materials and energy) is called “cradle-to-grave” manufacturing. McDonough and Braungart (1998) consider that the industry should convert into “cradle-to-cradle” manufacturing. Braungart et al. (2007) define cradle-to-cradle design as “a practical design framework for creating products and industrial systems in a positive relationship with ecological health and abundance, and long-term economic growth”. It is a central component of eco-effectiveness concept. Eco-effectiveness is developed from the concepts of eco-efficiency and zero emissions. Eco-

⁶ Corporate Green Power Procurement: <http://www.thegreenpowergroup.org/marketplace.cfm?loc=eu>

efficiency means producing maximum of goods while minimising negative effect on the environment while producing. Zero emission concept implies no negative effect on the environment. Eco-effectiveness goes further and aims to create synergy between ecology and economy adopting the metabolic systems of biological organisms to goods' manufacturing. It means that the output of one process is an output for another one. Everything (materials, energy) borrowed from environment to produce the goods are returned back to the environment and returned in a form which is safe for environment. There is no waste. Like the original nature.

Nowadays a group of studies arises trying to link eco-efficiency and financial performance (Hassel et al. (2005), Sinkin et al. (2008), etc.). For example Sinkin et al. (2008) composed a sample of eco-efficient and non eco-efficient firms out of the Fortune-500 listing (finally 431) and concluded that eco-efficient firms have a higher market assessment and that the adoption of eco-efficient technologies leads to a higher market value of the firm as well.

3.3.Negative relation between environmental and financial performance

The idea of a negative link between environmental and financial performance is supported by Gray and Shadbegian (1993), Walley and Whitehead (1994), Holman, New and Singer (1985), Jaggi and Freedman (1992).

The given approach assumes that the costs of environmental commitment are too high compared to potential benefits. Moreover, it causes a decrease in profitability and hence in the shareholders' wealth (Waddock and Graves, 1997). The existence of "green" costs which the companies incur transfer the expenses previously made by society to the organisations.

Porter and van der Linde (1995) called this approach a "static" model. However, as much "doubts" the Porter's theory itself caused 15 years ago, as much it causes now. One of the main opponents of Porter and van der Linde - Palmer et al. (1995) even called the idea "astonishing". The Porter theory was also supposed to have a political underpinning (Walley and Whitehead, 1994). The matter is that at that time the American vice president Al Gore was supporting an idea of gaining benefits from environmental initiatives and scrutinising the regulations to stimulate a better environmental performance. So Porter's idea was the right one to give an incentive to go "green".

The appearance of the very idea of profitable environmental commitment is explained by changing eras of environmental management (Walley and Whitehead, 1994). The first era (1970-1985) is characterised by rejecting environmental issues – companies simply did not even think about the involving of environmental strategy into their business strategy. However, the second era connected to the tighter environmental regulation and the movement supporting sustainable development "forced" companies to deal with environmental problems and to look at these issues in another way. Walley and Whitehead (1994) state that this is the time when environmental strategy became possible. Companies tried to go beyond getting fees for spills and etc. and used more advanced ways to deal with the impact on environment developing "greener" technologies and etc. For some organisations the environmental commitment appeared to be beneficial. Nevertheless, it is not seen as a widespread phenomenon.

Miles and Covin (2000), supporting the idea of positive linkage between environmental and financial performance, state that many of their opponents explain the negative linkage with the nature of goods which are traded. On the one hand, in case of commodity markets the price has a prior meaning so it does not give incentives to companies to develop green initiatives. On the other hand, potential cost savings from environmental innovations, lowered costs of capital and etc. can overcome this problem.

Environmental investments have always opportunity costs. Hence, decision to spend money on "green" initiatives can result in a shortage of money for the other profitable projects. So it seems to be a matter of priorities for the managers making these decisions.

Walley and Whitehead (1994) think that the profitability of “green” investments is unrealistic. Yes, such cases could exist but it is not a common practice – more exception than the rule. However, the necessity of environmental care is not argued. Walley and Whitehead (1994) just claim to be honest about related expenses and recognise them as vital. Instead of a win-win approach, it is more realistic to focus on the efficiency and effectiveness of running environmental projects. It is seen as a realistic alternative of impossible profitable environmental initiatives which can be even “dangerous” by decreasing shareholders’ wealth. It is argued that the desire of the financial department to get return on environmental issues can force the technical managers to find the technical solutions to environmental problems which were already found. The idea of Walley and Whitehead (1994) is that the managers should focus on the shareholders value, hence, the trade-offs between the costs and benefits of environmental commitment.

Filbeck and Gorman (2004) investigated a sample of 24 companies included in the IRRC/S&P 500 electric company industry. The sample was divided into two groups – “less compliant” and “more compliant”. The study shows that companies with worse environmental performance look better financially. Financial performance was measured on the basis of equally weighted monthly total returns (both dividends and capital gains) of investors. The result did not correspond to the initial hypothesis of Filbeck and Gorman (2004) that assumes a positive link between environmental and financial performance. They explained the unexpected outcome as follows. The investors value the stock of the less compliant companies higher because they think that the market initially overreacts “on the environmental concerns of these companies”.

McWilliams and Siegel (2001) link the issue to the agency theory basing the conclusions on the studies of Friedman (1970), Wright and Ferris (1997). It is suggested that corporate social responsibility is quite “expensive” for shareholders because of the alternative opportunity for expenditures – increasing the organisational efficiency. However, ignoring environmental issues can cost even more. Managers have their own goals which can be not in line with the shareholders’ interests. Managers’ performance indicators can simply exclude environmental concerns.

Schaltegger and Synnstedt (2002) suggest another framework for the “does it pay to be green” problem. It is proposed to switch from investigating environmental - financial performance correlation to the studies on the effects of different environmental management concepts on eco – efficiency. Eco-efficiency is perceived as an outcome of the environmental protection – economic success relation. Their way of reasoning is really fascinating and, in my way of thinking, it is worth not to save some trees to describe it.

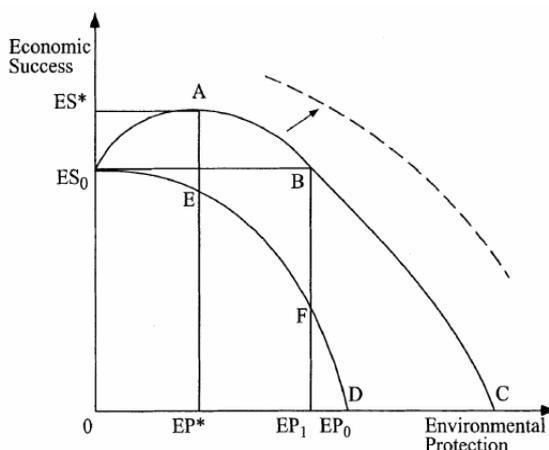


Figure 3.3. Possible relations between corporate environmental protection and economic success (Schaltegger and Synnstedt, 2002)

Two lines in the picture represent to the certain extent the above mentioned approaches: line ES_0 -A-B-C shows how environmentally friendly behaviour can bring financial gains while line ES_0 -E-F-D suggests investments in sustainability as additional costs bringing no return.

There can be made interesting conclusions from the graph:

- 1) Both strategies could potentially lead to bankruptcy. Nevertheless, the lower curve leads to collapse with inferior environmental performance while the upper curve with superior. It happens because organizations neglecting environmental care invest in sustainability too little, while the second group invests too much so that “green” image and costs savings do not pay off any more. Net marginal benefits turn into net costs.
- 2) The optimum of environmental and financial performance can be achieved at point A so exercising an environmentally friendly strategy
- 3) The curve ES_0 -A-B-C can shift to the right because environmentally friendly innovations, customer perception of “green” products added value and etc. will enable reaching higher environmental performance with lower costs.
- 4) With the same level of environmental performance, financial performance can be different. For example, in point EP_1 financial performance varies from F to B. What is more important Schaltegger and Synnestvedt (2002) see the reason of this variation in the quality of environmental management established in the company. It means the ability of managers to lead their company on the upper curve and find the best possible balance between the level of environmental commitment and enhanced financial performance
- 5) With the same level of financial performance different environmental performance can be achieved. Points ES_0 and B represent the same level of financial performance but completely different degrees of environmental performance.

So, with all these arguments, Schaltegger and Synnestvedt (2002) show that the upper curve is better to follow. The problem “does it pay to be green” repositioned into the problem which environmental management quality (strategy) should be chosen to reach the highest possible eco-efficiency level.

Schaltegger and Synnestvedt (2002) note that in reality this graph can look different. The reason is that potential fixed costs of sustainable acting can add some “steps” in the picture.

The aspects of fixed costs are very important to mention while investigating environmental – financial performance link, in my way of thinking. Most studies analysing the correlation between these two concepts trace how financial performance changes with different level of environmental commitment. However, the possibility of fixed costs of environmental management existing is simply not taken into account.

Klassen and Whybark (1999) suppose that the reason for the presence of different outcomes of environmental performance-financial performance in the companies can be investigated through the perspective of the resource-based view linked to the manufacturing strategy. They also point out that, for example, Hart (1995) defines a firm level’s strategic resources as a key that can explain the existence of two opposite opinions about relations between environmental and financial performance. However, this interpretation of Hart’s theory is quite narrow and biased. Hart linked all the benefits of environmentally sustainable economic activities to competitive advantage. However, competitive advantage and financial performance are definitely not the same. Competitive advantage is a tool to reach high financial performance. For sure, if the company goes better in the competition race it can contribute to the better financial performance but even this connection does not give a right to confuse these two concepts.

3.4.No link between environmental and financial performance

Some scientists support the position that there is no link between environmental and financial performance (Fogler & Nutt, 1975; Rockness, Schlachter, & Rockness, 1986, Ullman, 1985, Freedman and Jaggi, 1992). Actually, an underpinning for this group of studies can be that the relation between sustainability and profitability is not clear. There can be a lot of links connecting these two concepts through pathways which are company, industry, size, etc. specific.

Fogler and Nutt (1975) study 9 companies in the pulp and paper industry (based on Bragdon and Martin's (1971) study) and find out little or zero effect on financial performance if company is perceived as a polluter. So they state that even if socially conscious investors start selling these shares people who don't care about environmental issues and just want to earn money will buy these shares. So the share price would go first down, then up, and ending by reaching the same original level. Fogler and Nutt (1975) do not consider the fact that the majority of investors become environmentally responsible. In this case they rely on the data of Ryans' et al. (1972) survey which shows the priority of economic motives over social.

The study of Bragdon and Martin (1971) which became a basis for Fogler and Nutt's (1975) research attempted to prove that companies in pulp and paper industry performing environmentally well are less profitable. However, the findings show that it is just the other way around. Nutt and Fogler (1975) attempted to prove a positive environmental performance – financial performance relation while empirical results show that there is a negative link.

Schaltegger and Synnstedt (2002) come up with two possible options linking environmental and economic performance:

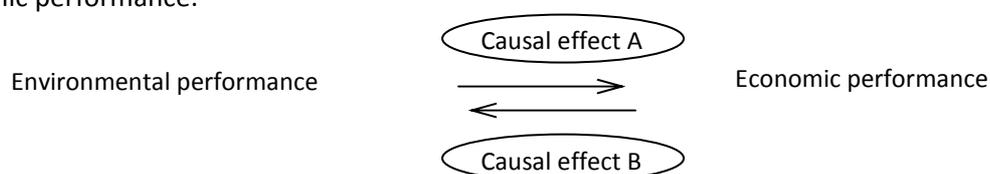


Figure 3.4. Current approaches of environmental performance – economic performance relation analysis (Schaltegger and Synnstedt, 2000)

Causal effect A represents the opinion that environmental performance affects costs and revenues of the company, thus define economic performance to the certain extent. Causal effect B is related to the persuasion that only financially successful companies can “afford” such a thing like good environmental performance. Hence, financial position of the organisation decides on the opportunity of financial support of environmental performance. So financial performance leads environmental performance. However, Schaltegger and Synnstedt (2002) identify the hypothesis which suggests a direct link between “green” and economic success as questionable. Klassen and Whybark (1999) suppose as well that there can be other forces in play such as management strategy or firm level resources behind the environmental performance – financial performance relationship. So the link between environmental and financial performance can be drawn through the extraneous variables.

Link B can be explained with the help of a slack theory which proposes that better financial performance implies the existence of different kinds of slack resources. So the more resources a company possesses, the more it can invest in such actions as for instance environmental initiatives and in doing so improve financial performance.

Henriques and Sadorsky (1996) advise to develop an environmental plan necessary to conduct “a cost – benefit analysis” of environmental commitment. Companies should compare both monetary and non – monetary benefits such as acquisition and/or maintenance of market share, potential efficiency gains and increased positive reputation with different costs linked to environmental plan exercising, regulatory compliance costs and opportunity costs of investments into the “green” production. Schaltegger and Burritt (2000) develop the approach emphasizing the necessity of environmental accounting in finding the optimum between sustainability and profitability.

3.5. Measures of financial performance while investigating environmental performance – financial performance relation

The measures the various studies used for financial performance are quite diverse. Al-Tuwaijri et al. (2004) divide them into two big groups: accounting and market based. They notice that accounting based measures have a lot of disadvantages for the research as they are based on such indicators as

profit, assets value which are very specific depending on the company size, industry, etc. Konar and Cohen (2001) also support the market value measures. Moreover, they divide the studies into two categories:

- 1) investigating the relationship between environmental and financial performance over time
- 2) investigating the influence of environmental performance on the market value of companies. It is mostly done through assessing the impact of new information. For example, like in the way Klassen and McLaughlin (1996) trace the effect of environmental events (awards) on the stock returns.

Konar and Cohen (2001) are those of the scientists who measured financial performance with Tobin's q. This measure is based on the fact that the market value of the firm represents the value of its tangible and intangible assets. Tangible assets are very important – organisations cannot exist without them. However, specifically intangible assets allow deriving extra returns from the tangible assets usage.

It is possible to assess the market value of the firm but difficult to decompose it into the parts of values formed by tangible and intangible assets. The value of tangible assets is perceived by Konar and Cohen (2001) as replacement costs of fixed assets. That's why the Tobin's q is convenient to measure financial performance – it represents the market value of the firm divided by the value of its tangible assets (replacement costs) and is equal to the sum of one (the value of Tobin's q if the company has no intangible assets) and the quotient of intangible and tangible assets' value.

Actually, market value is an expectation of future profitability. So Konar and Cohen (2001) proposed to use for financial performance measurement also indicators related to profitability: market share of the firm, sales growth, R&D expenditure, advertisement expenditures, etc.

| Study | Description | Financial performance measure |
|------------------------|--|--|
| King and Lenox (2001) | The firm market valuation relative to the replacement costs of tangible assets | Tobin's q |
| Konar and Cohen (2001) | Profitability measures include market share of firm, sales growth, R&D expenditure, advertisement expenditures, import – consumptions ratios (controlled for the company's size and industry) | Tobin's q + profitability measures |
| Cohen et al. (1997) | $ROA = (\text{Income Before Extraordinary Items} + \text{Interest Expense}) * (1 - \text{Tax rate}) / \text{Average Total Assets}$ $ROE = \text{Income before Extraordinary Items} / \text{Average Stockholders' Equity}$ $\text{Total risk-adjusted return to shareholders} = (\text{Change in Stock Price} + \text{Dividends}) / \text{Initial Stock Price} * \text{Beta}$ (Beta is a specific measure for each company's stock price variability calculated for 6 years) | ROA, ROE, Total risk-adjusted return to shareholders |

Table 3.1. Measure of financial performance used in studies investigating environmental performance – financial performance relation

3.6. The role of industry and company's size while investigating the environmental performance – financial performance relation

In the Klassen and McLaughlin's (1996) study it is important to mention that they emphasized the role of industry (whether the industry is dirty or clean) in the environmental performance – financial performance relation. In their opinion, the better environmental performance is valued more in the cleaner industries because the analogous messages from "dirty" industries are taken with scepticism. However,

companies operating in “dirty” industries incur more costs to act in accordance with environmental regulation, standards and requirements. So it automatically implies that they can potentially benefit more from cost savings of acting in a sustainable way. Konar and Cohen (2001) found that negative environmental events lead to the worse financial performance and the generated loss is bigger in the more polluting industries.

King and Lenox (2001) share the point of view mentioning that cleaner industries have higher returns due to the lower compliance and regulatory costs. It is found that the company’s environmental performance, the industry and higher financial performance are associated with each other. However, a plausible and consistent link to explain and confirm that operating in certain industries (clean/dirty) can lead to the certain financial performance (higher/lower) is not found. King and Lenox (2001) present also the position that the more strict the industry is regulated, the higher company’s orientation towards environmental commitment is because the costs on non-compliance are higher. However, they agree themselves that this statement is quite questionable.

Cohen et al. (1997) tried to eliminate the effect of industry including in their study the “industry balanced portfolios” of “low-polluters” and “high-polluters”. Their findings are that in most cases low polluters perform better financially than high polluters. However, only 20% of comparisons’ results are statistically significant.

Many studies emphasise the importance of the company’s size while investigating the environmental performance – financial performance relation (Konar and Cohen, etc.). It is stated that behaviour of large companies is more transparent so they attract more attention, they are more noticeable and targetable. They also have more resources available to commit to environmental initiatives (Buysse and Verbeke, 2003; Henriques I. and Sadorsky P.; 1996). Haverkamp et al. (2010) found that the larger the company is, the stronger its environmental capabilities are developed. It is stated: “The deeper the pockets of a firm, the more likely it will be able to support the costs associated with implementing an environmental strategy”. Bansal and Bogner (2002) notice that larger companies are potentially more dangerous taking into account the scale of their activities. So large companies should incur more costs to be relatively safe for the environment.

In this case small companies, on the one hand, cannot involve so much recourses. It automatically implies competitive disadvantage compared with large companies. On the other hand, small companies seem to have less impact on the natural environment.

3.7. Conclusion

The present chapter investigates the existence views on the environmental performance relation. Table 3.2 provides an overview of the most frequently mentioned studies by the articles about environmental performance-financial performance relation.

To sum everything up, there are three positions supporting the positive, negative and neutral relation between environmental and financial performance. All the three viewpoints are examined as well as the arguments used to support them. Actually, most studies identified a positive environmental performance – financial performance relation. Environmental investments can become profitable through cost savings and market share gains. In spite all these things King and Lenox (2001) emphasize that many studies are missing longitudinal data. So a number of studies should be done - it takes several years – to come up with more definite information about the nature of environmental performance – financial performance relation.

The chapter also accounts for the financial performance measurement used in different studies and other factors that can become the mediating variables (industry the company operates in, company size).

| The study | Financial performance indicators | Environmental performance indicators | Findings |
|-------------------------------|--|---|---|
| King and Lenox (2001) | Tobin's q | <ul style="list-style-type: none"> • total emissions • relative emissions • industry emissions | The analysis of 652 U.S. manufacturing firms provides the evidence of an association between lower pollution and higher financial valuation. A firm's fixed characteristics (size, capital intensity, growth, leverage, etc.) and strategic position might cause this association. |
| Russo and Fouts (1997) | ROA | Independent environmental ratings based on compliance records, expenditures, and other initiatives used to meet new demands, to reduce waste reduction, and to support environmental protection organizations | "Higher environmental performance is associated with higher financial performance, and the relationship is strengthened as industry growth rises". |
| Konar and Cohen (2001) | Tobin's q + profitability measures | <ul style="list-style-type: none"> • TRI - the aggregate pounds of toxic chemicals emitted per dollar revenue of the firm • LAW - the number of environmental lawsuits pending against the firm | The poor environmental performance significantly negatively affects the Tobin's q of publicly traded firms (from S&P 500). This negative effect is stronger in the polluting industries. |
| Filbeck and Gorman (2004) | Three years return | Spill Index, Compliance Index, Emissions Efficiency Index, Permit Restriction Indices, Cleanup Indices | The analysis of empirical data shows that companies with worse environmental performance look better financially. However, it was not hypothesised initially |
| Klassen and McLaughlin (1996) | The stock return change following the environmental event | Positive environmental event, specifically the announcement by an independent third party of winning an environmental award | The study proved the positive link between environmental and financial performance. The sample is constructed of 82 companies. |
| Chirstmann (2000) | The cost advantage resulting from a firm's environmental strategy, assessed relative to the firm's major competitors (according to the manager's perception) | The firms' use of pollution prevention technologies, their innovation of proprietary pollution prevention technologies, and their timing of environmental strategies (according to the manager's perception) | The use of pollution prevention technologies has a negative effect on cost advantage. Early timing has a positive effect on cost advantage but it is not significant. The data support the hypothesis suggesting that innovation of proprietary pollution prevention technologies contributes to cost advantage. |
| Sarkis and Cordeiro (2001) | Return on sales (ROS) | Total annual amount of toxic chemicals injected into the underground wells, releases as a result of remedial actions, catastrophic events or other one-time events not associated with production, etc. | It is found that for 482 US, "pollution prevention and end-of-pipe efficiencies are both negatively related to ROS, and that this negative relationship is larger and more significant for pollution prevention efficiencies". |
| Cohen et al. (1997) | ROA, ROE, Total risk-adjusted return to shareholders | TRI, Number of environmental litigation proceedings, Number of noncompliance penalties, Number of oil spills, Volume of oil spills, Number of chemical spills, etc. | The study investigated the data set of the Standard and Poor's 500 companies. Two industry-balanced portfolios of "high polluter" and "low polluter" were constructed. The findings are that in most cases low polluters perform better financially than high polluters. However, only 20% of comparisons' results are statistically significant. |

Table 3.2. The studies on environmental performance-financial performance relation, indicators to measure environmental and financial performance, and the findings

Chapter 4.

4. The relation between innovation and strategic orientation of the organization

4.1. Introduction

The present chapter is focused on one of the parts of the research model as it is shown in the Figure 4.1.



Figure 4.1. The research model. Focus of Chapter 4.

The aim of the chapter is to get insight in the relationship between strategic orientation of organisations and innovation types. Strategic orientation is examined through the perspective of Porter's (1985) theory dividing organisations into cost leadership, differentiation, focus and "stuck in the middle" depending on the source of competitive advantage and the scope of the market segments where they operate. Actually, what Porter (1985) called "stuck in the middle" can hardly ever be called a strategy. It is more a strategic position. The Miles and Snow (1978) strategic typology is compared with the Porter's generic strategies. As for innovation, the study distinguishes between process/product/market innovation, open/closed innovation and explorative/exploitative innovation. The link between strategic orientation and all the mentioned types of innovation is examined.

4.2. Strategic orientation of organization

4.2.1. Porter's (1985) generic strategies

Porter (1985) defines a competitive strategy as a firm's relative position in the competitive environment. The company should position itself in a way that allows it to derive the returns above the average. This long run ability is viewed as a sustainable competitive advantage. Porter (1985) distinguishes between two generic strategies enabling to obtain a sustainable competitive advantage – cost leadership and differentiation (Table 4.1.).

| Strategies | Cost leadership | Differentiation |
|------------------------|--|--|
| Characteristics | | |
| Focus | Low cost producer in the industry | Producing goods possessing special attributes different from what the competitors could offer and especially valued by customers |
| Segment | Very broad – can include many industry segments or even close industries | Segment of customers with specific needs or needs which are not satisfied by competitors |
| Specific features | Source of cost leadership such as economy of scale, preferable access to materials, etc. | Differentiation base such as product itself, specific marketing, way of delivery, etc. |

| | | |
|---|--|---|
| How to derive returns above the average | Parity or proximity in the bases of differentiation insuring that the goods in spite of the lower prices/costs are comparable to the goods offered by competitors and the price discount still allows to derive higher returns | Cost parity or proximity ensuring that the costs of differentiation are lower than the differentiation premium and all the costs not leading to differentiation are minimised |
|---|--|---|

Table 4.1. Comparison of two generic competitive strategies - cost leadership and differentiation

As it is shown in the Figure 4.2, according to Porter (1985), four options are possible. Two of them were already discussed – cost leadership and differentiation. The third one is a “focus” strategy. It assumes operating in a narrow competitive scope within the industry borders. The company serves the segment with the best appropriate strategy – differentiation or cost leadership. However, the chosen segment should be attractive – should allow deriving high profit levels. Otherwise, it does not make much sense to operate there.

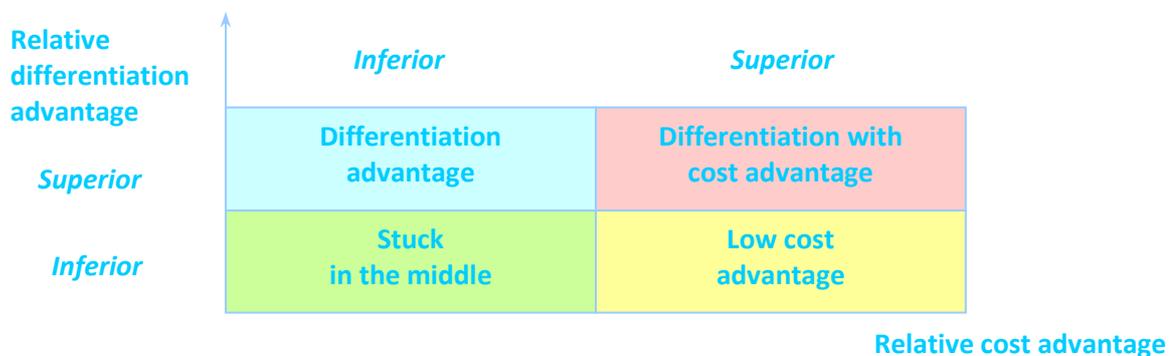


Figure 4.2. Porter's (1985) generic strategies (Bremmers and Giesen, 2008)

Porter (1985) also depicted a strategic positioning which is described as “do not stuck in the middle”. It means do not try to target all the strategies achieving success at the same time. Companies that are “stuck in the middle” perform worse than the competitors pursuing “successful generic strategies” (cost leadership, differentiation or focus) in most of the cases. They fail to reach any of competitive advantages to the extent that allows being a leader.

Porter (1985) assumes an opportunity to reach a high level of financial success for companies pursuing both cost leadership and differentiation strategy. However, this route is quite challenging and success is possible only if competitors in their turn are “stuck in the middle” or if the companies are the “pioneers in major innovation”, etc. It is mentioned that the firm introducing new technology, for example, can lower the costs and foster differentiation as well – reach the targets of both the companies pursuing the cost leadership and differentiation strategy.

Box 4.1. Miller (1988) about the structure, strategy and environment⁷

According to Miller (1988), Porter's (1985) strategies interact with the environment. On the one hand, environment defines the strategy. For example, differentiation strategy more fits in the dynamic environment. On the other hand, strategy defines the environment to the certain extent “through customer needs and competitors' challenges”. The structure and the strategy also interact in a similar way: the structure defines the strategy, and the strategy in return defines the structure.

The research of Miller (1988) aims to link strategy and environment, and structure and strategy also considering that a good performance is linked to the complementarity of strategy with structure and environment (figure 4.2.).

⁷ The term “environment” here is not related to the natural environment but to the business environment.

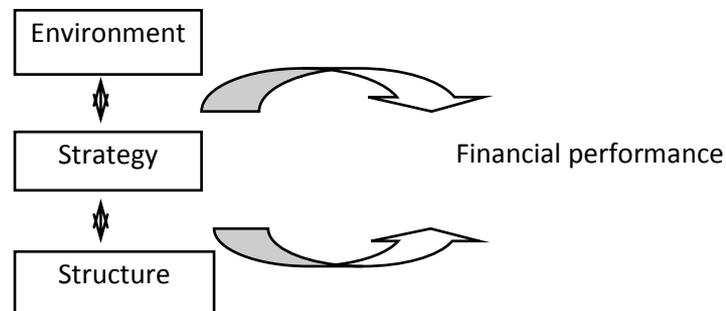


Figure 4.3. Miller's (1988) research model

Linking environment and strategy, and structure and strategy, Miller (1988) argues that there is no strong relation between environment and structure. As for the strategy, Miller (1988) considers the classification provided by Porter (1980) as a not complete one: Miller's (1988) study distinguishes between differentiation strategy with product innovation and differentiation strategy emphasizing marketing and image. It is assumed that innovative and marketing differentiation fits in the uncertain and dynamic environmental conditions while cost leadership is associated with a stable environment and a low level of uncertainty. The empirical results show that the uncertain and dynamic environment positively correlates with both innovation and marketing differentiation strategy. Cost leadership is, indeed, negatively related to the environment uncertainty and dynamism but this relation is not statistically significant.

As for the structure-strategy relation, it is argued that innovative differentiation strategy is positively correlated with the use of technocrats, liaison devices and authority delegation. The innovative differentiation strategy relies on technocrats as highly educated personnel to generate innovative ideas and design their practical implementation. This process requires constant extensive communication with the help of liaison devices. Within the given conditions, authority cannot be concentrated in one part of the company (e.g. manager) because the knowledge required to perform innovation is too broad and extensive. On the contrary, cost leadership, according to Miller (1988), is negatively associated with the use of technocrats, liaison devices and authority delegation but extensively relies on the formal control. To keep focus on the cost efficiency, cost leaders extensively use the formal control mechanisms. The operations are highly standardized and do not require technocrats. In fact, formal control is claimed to substitute the use of liaison devices and authority delegation. Marketing differentiation is not supposed to be associated with the use of technocrats, liaison devices and authority delegation. Actually, the focus on marketing department enables to find technocrats, liaison devices in the marketing department and authority should be also concentrated there. However, within the company in total, the presence of all these tools is not significant.

Correlation analysis confirms the use of technocrats, authority delegation and liaison devices by companies pursuing innovative differentiation strategy (regression analysis failed to prove the significance of authority delegation's use in this case). Marketing differentiation strategy, indeed, does not rely on authority delegation and technocrats' use, except liaison devices lowly correlated with the given strategy. Cost leadership strategy is found to be negatively associated with liaison devices, authority delegation and technocrats. However, only negative correlation with liaison devices is significant. The use of formal control is statistically proved.

4.2.2. Strategic orientation according to Miles and Snow (1978)

Based on the level of consistency among organisational strategy, technology, structure, and process, Miles et al. (1978) distinguish four strategic types: prospectors, defenders, analysers and reactors. Each type has its own approach how to deal with most important problems posed by Miles et al. (1978):

1) the entrepreneurial problem is perceived as a definition of organisational domain – “a specific good or service and a target market or market segment”

2) the engineering problem represents a kind of technology (input-transformation-output process) corresponding to the managerial solution of entrepreneurial problem. It assumes new or modified information, communication and control linkages.

3) the administrative problem is explained as rationalising and stabilising activities which help organisations to cope with arising entrepreneurial and engineering problems

Apparently, Miles et al. (1978) operationalise these problems for all the four strategic types and show their approaches to cope with them.

Miles et al. (1978) base themselves on the way Burns and Stalker (2001) distinguishes among management systems. They came up with four main types: “machine model” (focused on the efficiency of procedures), “business model” (focused on the profitability of operations), “organic model” (focused on the aspects of environment) and “pure model” (emphasizing the identity of the organisation in system building). Finally, these four types are narrowed down and presented as two generic models – “machine model” (assuming the recourse manipulation in order to derive profit) and “pure/organic model” (focused on the needs the model designed to serve).

Based on Table 4.2., it can be concluded that defenders better act in the stable conditions which minimise the major threat for them – the risk of ineffectiveness. On the contrary, the flexible organisations of prospectors are designed to perform better in uncertain conditions. It follows from the real options approach. The diversity of their activities does not allow them deriving the same level of profits as defenders, given the stable conditions. However, they are much more adapted to react for changes. Hence, the main risks of prospectors are low profitability and “overextension of recourses”. Analyser is supposed to be somewhere in the middle between defenders and prospectors, absorbing the features of both. Hence, some organisational complexity is created as well.

Actually, defenders, prospectors and analysers can be seen as points on one scale. Based on the level of proactiveness, prospectors are the most proactive, defenders – just the opposite and analysers occupy the position somewhere in the middle between the two.

Reactors, according to Miles et al. (1978), can be considered as a “strategic failure”. They cannot respond to the environment by developing a consistent and stable strategy. The reason for acting like a reactor can be:

- 1) the top management is not able to come up with a clear strategy
- 2) there is a misfit between organisational structure, processes and strategy
- 3) the management does not adapt strategy and structure to the environmental changes

According to Johnson et al. (2008) companies can have different ways to deal with environmental – red or blue ocean strategies. Blue ocean strategy means exploring new unoccupied strategic gaps in environment while the red ocean implies the rivalry in already known parts. Strategically, prospectors are supposed to find out the blue ocean while defenders are concentrated in the red one.

| Problems Strategic Types | Entrepreneurial | Engineering | Administrative |
|-----------------------------|--|--|--|
| Defender | <p>1) create a stable domain – a limited market segment where the limited product assortment is sold</p> <p>2) operative aggressively in this domain</p> <p>3) growth through market penetration and limited product development</p> | <p>1) technological efficiency – single core technology which is extremely cost-efficient</p> <p>2) sometimes technological efficiency is accelerated through the process of vertical integration</p> | <p>1) strict control</p> <p>2) limited search for new opportunities that can be derived from the environment</p> <p>3) centralised control</p> <p>4) intensive costs planning</p> <p>5) communication through the formal hierarchical structures</p> <p>6) top management is led by cost - control specialists</p> <p>7) “mechanistic” management system</p> |
| Prospector | <p>1) focused on the changing domain exploiting new product and market opportunities</p> <p>2) due to the constant scanning of the environment for new opportunities, prospectors can be perceived as changes initiators in their industries</p> | <p>1) flexibility</p> <p>2) a lot of technologies used together with low routinisation and mechanisation</p> <p>3) focus on innovation</p> | <p>1) flexibility</p> <p>2) decentralised control</p> <p>3) extensive result – oriented planning</p> <p>4) low formalisation</p> <p>5) both lateral and vertical communication</p> <p>6) top management is led by marketing and R&D specialists</p> <p>7) “organic” management system</p> |
| Analyser | <p>1) the domain has features of both prospector’s and defender’s domain</p> <p>2) imitation is used as a tool – only successful innovations are adopted</p> <p>3) growth through both market penetration and product and market development</p> | <p>1) the dual technological core. On the one hand, it is characterised with high level of standardisation, mechanisation and routinisation. While, on the other hand, flexibility.</p> <p>2) duality is managed with the help of applied research group</p> | <p>1) matrix organisational structure is used</p> <p>2) intensive planning between marketing and production divisions</p> <p>3) broad planning between applied research group and product managers</p> <p>4) centralised mechanisms combined with the decentralised</p> |

Table 4.2. Characteristic of main strategic types according to Miles et al. (1978)

4.2.3. The link between Porter's (1985) generic strategies and Miles and Snow's (1978) main strategic types

Both Porter and Miles and Snow came up with three types of successful strategies. The fourth type - Reactor for Miles and Snow (1978) and what was describe as "stuck in the middle" by Porter (1985) - can be seen as a failure.

A number of studies tried to link these two typologies. The theoretical underpinning is quite strong and logical. Hambrick (1983) mentions that prospector is similar to the differentiator as far as they innovate "early in the face of product/market opportunities". While defenders can be fit in the cost leadership strategy searching for stability in cost leadership.

Segev (1989) went further and attempted to link defender to cost leadership, prospector - to differentiation, analyser – to focus and reactor to the "stuck in the middle". Defender and prospector as well as cost- leadership and differentiation are seen by both theories as the two opposed strategies. Analyser or focus strategies are to the certain extent the hybrids absorbing certain features from both polar successful strategies However, Segev (1989) notices that "while they (Porter's and Miles and Snow's typology) presumably classify the same phenomena, the two typologies are different, each stressing somewhat different aspects of business level strategy".

Morgan et al. (2009) state that, compared to Porter, Miles and Snow do not link their strategic types to any level of business performance and present their typologies as "problem and solution sets". They also mention Kald (2000) who saw a focus of Porter in strategic positioning description while Miles and Snow target the development of the "basis for strategic pattern" – working out the patterns which the companies can follow.

Based on the study of Ozsomer et al. (1997), Laforet (2008) states that "proactive firms differentiate themselves from their competitors by changing their production methods and products". It is also stated that innovativeness is an essential feature of proactive companies as well as aggressiveness, competitiveness and risk taking. Hence, as far as prospectors according to Miles and Snow are the most proactive strategic type it also links them to the Porter's differentiation strategy. Burton et al. (1998) state that the focus of the differentiation strategy is developing special characteristics of products and services, and innovation can be a tool to pursue this strategy successfully. Similarly, prospectors focus on the "uniqueness of product".

Actually the main point of any defender is efficiency. Companies pursuing defender strategies are headed by cost control specialists in top management and emphasise costs in their planning. So the analogy between defenders and cost leadership looks quite logic.

The prospectors are focused on innovation, R&D, marketing. So they have opportunities to develop specific products and services, or products and services with specific features especially valued by consumers. These things can also underpin a differentiation strategy.

To sum everything up, Miles and Snow strategies and Porter strategies can be matched: defender – cost leadership, prospector – differentiation, analyser – focus and reactor – "stuck in the middle".

4.3. Innovation types

As it was already mentioned innovation involves the conversion of new knowledge into a new product, process or service and the putting of this new product, process or service into use, either via the market place or by other processes of delivery (Johnson et al., 2008).

There are a lot of types of innovation distinguished. Usually the product, process and market innovation are distinguished. Actually, this typology was proposed by Schumpeter (1982). In the introduction to the Schumpeter's book "The theory of economic development" (1982) Elliot mentions that Schumpeter distinguished among four types of innovation - new product or process of production, a new mar-

ket or a source of supply and a new form of business, commercial or financial organisation. So it can be basically distinguished among product, process, market and organisational innovation.

Product innovation implies improved or radically changed products or services. However, the innovation makes sense only in case of improving or changing features valued by the customer. Utterback and Abernathy (1975) notice that product innovation changes its focus with the time from product performance through product variety to product standardisation and costs. Referring to product innovation it can also be useful to distinguish between products new to the firm and new to the market (Sabidussi, 2009). If the introduction of the products new to the market really says something about company's possibility to innovate, products new to the firm mostly show how fast the company can adapt to the changing market. So introducing products new to the form is more defensive.

Process innovation is a change in the way of production or distribution. The process innovation evolves through more sophisticated stages than product innovation. First, it is very capital intensive. Then it enhances direct labour productivity through work division and specialisation. It brings standardisation in product innovation and finally pays off with a large scale production (Utterback and Abernathy, 1975).

Johne (1999) defines market innovation as an "improving the mix of target markets and how chosen markets are best served". The purpose of this kind of innovation is perceived as identifying new potential markets and improving the marketing approach to the segments which are already being served.

The traditional approach to innovation assumes that innovation is based on the use of internal firm resources - technological and scientific base – to innovate. There is not so much involvement of external partners in the innovation process. The ideas are filtered and the most promising of them has the only route – one entrance and one exit to the market. So the innovation is born, "brought up" and allowed to the market due to internal procedures within the company, and protected by patents and licenses. This type of innovation aims developing internal organisational capabilities to innovate (heavily investing in R&D, hiring most professional staff). This state of innovation is described by Henry Chesbrough (2006) as "closed". However, he developed a concept of open innovation. Open innovation is defined by Chesbrough et al. (2006) as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively". In other words, innovation should be fostered in the atmosphere of the "open" world – the company should use not only internal but also external resources to innovate while knowledge should be distributed and shared. In this case the innovation base is represented by internal and external resources and technologies and new finding can inflow and outflow at any stage. For example, the ideas which were rejected by this particular company can be useful for another one. So the idea born in one company can appear as a product, service or any other improvements in a completely different market, being used by other companies as well. Apparently, while closed innovation can be presented as one entrance - one exit, the open innovation stands for multiple entrances and exits at all the stages of the process.

Actually, I would suppose also that closed vs open innovation can be associated with an individual vs a collective approach respectively, If a company pursues a closed innovation strategy it has to develop its own internal capabilities and rely mostly on them, which is also quite costly. While open innovation is more a process of sharing or exchange because the company can use not only its own internally developed resources and capabilities, but also use the external sources. An important point can be that the company can make money of their own internal capabilities in two ways: first exploiting them for the company itself and then sell ideas generated by them to external users. It can be related to the risk reduction. So if individualistic innovation is quite costly, the company can be better off with the open innovation.

Dittrich and Duysters (2007) distinguish between explorative and exploitative innovation. To innovate, the companies interact with other companies. The interaction can be defined by two dimensions – frequency of contacts and the distance between the technological fields of the organisations. The closer the partners' position in the industry is, the higher the contacts frequency is as well. The companies with small distance and high frequency are supposed to be "strong ties" while the distant and rare partners

are “weak ties”. So companies adopting explorative innovation approach collaborate widely with both “strong” and “weak ties partners”. They use both networks to generate not only a lot of information but also diverse information. Exploitative innovation is characterised with “strong ties” dominating interaction.

However, the statement that “weak ties” are really so important is quite questionable. The idea of strength of “weak ties” was proposed by Granovetter (1973). Is it designed for social human relationship. The ties are divided into strong, weak and absent depending on the time people spend in contact with each other, the emotional intensity, mutual confiding and reciprocal services. The point is that people with most frequent and close contacts are most similar as well. So their communication can only bring a relatively small amount of new interesting information. Hence, in this case “weak ties”-people are more distant - with more different interests are essential for providing new information and opportunities which can be a cement bonding strong ties together.

The idea of Granovetter (1973) was opposed by Burt (1993). He states that the “weak ties” are really weak. The contacts (weak ties) of your friends (strong ties) can be introduced to you and improve your network by making it larger. However, Burt states that “large” is not a positive term since the efficiency of network is decreasing as well as the redundancy of contacts is going up. It brings the time scarcity.

Applying all this information to the company level, it can be stated that according to Granovetter (1973) the contacts with distant companies with different interests (also in the other industries) help to bend the contacts with “strong ties”. The existence of “weak ties” enables development of the industry due to new opportunities and information inflow. However, Burt (1993) argues that taking the “weak ties” into account brings time tension, network inefficiency and increased contacts redundancy.

Box 4.2. Coleman's (1988) view

Coleman (1988) introduces the paradigm of the “social capital” which is defined as “a variety of different entities with two elements in common: they all consist of some aspects of social structures, and they facilitate certain actions of actors within the structure”. It is stated that “closure” is a very important characteristics of networks which can increase the social capital. The reasons why the social capital should be higher in the networks with closure is that closure brings about effective norms, increased trustworthiness and enabling the obligations. Coleman (1988) considers norms as the possibility to limit negative effects and encourage positive effects of some actors. For example, in the closed structure where actors C and B are linked to actor A and other companies but not to each other. Actor A starts to influence negatively B and C. To impose constraints on A, B or C cannot collaborate because they are not connected. So to restrict A (separately) they should be really harmed by A (separately) and be powerful enough to be able to oppose to A. In the networks with closure all A, B and C are connected to B and C can join their efforts to restrict A. The same implies for the obligations. In the structures without closure, “the obligation defection can be effectively sanctioned, if at all, by only the actor to whom it owed”. As for trustworthiness, Coleman (1988) mentions that open structures cannot facilitate it because there are no conditions for reputation creation and the collective sanctions are not possible.

4.4. Explorative/exploitative oriented innovation strategy vs strategic orientation

In spite of the fact that explorative and exploitative innovation are supposed to be opposite concepts they are interdependent. Exploration brings novelties. Such novel ideas are brought to the dominant design. After a while existing innovation comes with a new variety of implementation contents and enables the idea exploitation. This exploitation cannot last forever so the companies start thinking about small incremental changes in existing products and services which can give a differentiation base. These incremental changes can be brought together and lead to the next innovation. This process, first described by Gisling and Noteboom (2006), is called a “cycle of discovery”.

It is necessary to mention that not all the designed products reach a desired successful level of performance. 80 % of newly introduced products fail (Crawford, 1977). So launching new products is associated with high costs and high risk levels. Hence, the companies heavily innovating in terms of products, must be risk-taking.

When the novelty is being converted into the dominant design a lot of things happen. First, the uncertainty decreases, the competition rises and the need for efficiency rises as well. To reach high efficiency companies use economies of scale, specialisation and a more effective distribution of labour. The knowledge becomes codified. All these changes reflect also a more formalised governance structure. What is typical for exploitation is that strong ties are established more and more: the need for stability and efficiency assumes more frequent and durable contacts with the close partners in supply chain. Focus on efficiency and formalised structures are essential characteristics of defenders. Actually, it is very logical to assume that defenders appear at a later stage of innovation life cycle compared to prospectors. They come for a large scale efficient production and distribution of previously developed goods and services and enable the return on initial investments acting like exploiters.

Experimental changes, novelties combinations pile up and become an innovation. At the certain point they grow out of incremental innovation limits and turn into the changes associated with exploration. The situation in this case is unstable and uncertain: a lot of companies try to enter the business but a lot quit as well. The changing reality is associated with flexible structure, short duration of contacts and high frequency with broad range of partners. The knowledge is tacit. So this situation is more suitable for prospectors with their high innovative potential and flexible structure ideally fitting in uncertain business.

Gisling and Noteboom (2006) state that companies have to deal both with exploration and exploitation to perform well in the long run and the short run respectively. However, such a combination is quite challenging, because it requires a lot of efforts together with financial resources. To succeed both in long and short run companies have to create networks. The reasons can be that "a network organisation's greater combinatory flexibility reduces innovation time, enhances commercialisation opportunities by exploiting downstream partners' market access, and allows exploration oriented firms to exploit the efficiency of their network partners" (Gisling and Noteboom, 2006). This organisation form is called a "federation" or "community" model. The firms share knowledge and resources to innovate and perform better in the chosen markets. So in the networks prospectors provide innovation, defenders provide market access, while analysers act as an intermediate stage between prospectors and defenders linking mechanism commercialising new products or services developed by prospector before defenders start to exploit the market in a more efficient manner.

4.5. Schumpeter's typology of innovation vs strategic orientation.

The function of prospectors is to launch new ideas, to be the first mover in the market. Then analysers help to commercialise new goods and find the appropriate forms of goods which can be sold on a large scale. Then efficient defenders take over and lead the process of production to the "state of art" to gain maximum profit from rational cost policy. The same is observed for Porter's strategies – differentiators focus on product specific features, so they can develop goods and services which will be adopted by companies pursuing a focus strategy to the specific consumers. Then cost leaders go the same way as the above-mentioned defenders.

For prospectors/differentiators it is rational to apply product innovation, because it allows distinguishing themselves for consumers and forming markets for new products to exploit first mover advantages. Then analysers/"focus" use market innovations to adapt a new product to consumers and to expand the set of product variations. Later on, the defenders/cost leaders adopt proved products by prospectors/differentiators and analysers/"focus" and manufacture and distribute them in the most efficient (especially from the costs side) manner. Rivalry is typical for the markets defenders/cost leaders operate in. According to Porter (1985), it is crucial to become not one of the cost leaders but the winner of the

competitive race at this market, to fully exploit the corresponding advantages. In this case process innovations aiming at cost leadership can be essential to realize the chosen strategy successfully. Many studies pointed cost reduction as one of the most important motives for process innovation (e.g. Boer and During, 2001). However, the prospectors/ differentiators can also use process innovation as it can serve a differentiation goal as well. Moreover, flexible structure of prospectors is designed to facilitate process innovation as all the layers of the company employees are included in the decision making process.

Considering product innovation from the perspective of product new to the firm and new to the market can generate interesting results. I would suppose that as far as products new to the firm require a real innovation in generic terms while new to the company products express that a company tries to keep up with the market. So companies introducing the new to the market goods exercise first mover advantages while the others can benefit from early mover or late mover advantages. Regarding the strategy, prospectors are those who are “responsible” for designing completely new products (new to the market) so they are more likely to be associated with first mover advantages. Then analysers use new to the firm product innovation and market innovation to develop strategies for product change. Finally, defenders use new to the firm product innovation together process innovation to gain efficiency.

Cooper (1998) shares this point of view and says: “Porter (1980) argued that a key aspect of realizing a low cost business strategy rests with the firm’s ability to reduce costs through process innovation, while a differentiation strategy depends on the firm’s ability to generate totally new product ideas or new combinations of features in existing products”.

Laforet (2008), investigating the relation between strategic orientation and innovation, suggests that prospectors are not only more innovative than defenders (have more innovation prizes) but also outperform defenders in product innovation, having more new product ideas, launched products, patents and designs. Related to process innovation, it was not supposed to have any significant differences between prospectors and defenders. They were not found in practice as well. It should be taken into account that the research was done for SMEs. O’ Regan and Ghobadian (2005) came up with similar results also investigating SMEs.

4.6. Open/closed innovation vs strategic orientation

The relation between open/closed innovation and strategic orientation is not exploited that much compared to other innovation types. The reason can be that the open innovation paradigm was proposed by Chesbrough as the next chronological stage in the way the companies should innovate.

To accept the model of open innovation companies should have the developed capabilities ensuring this process. Such capabilities can be represented by, for example, the openness of company culture. Laforet (2008) proved that prospectors have an open culture which is supposed to foster innovation.

Vera and Crossan (2003) came up with two patterns of behaviour the companies usually adopt as an innovation strategy: explorers and exploiters. What is interesting, explorers are associated with open culture and a prospector strategy while exploiters are more supposed to be closed culture defenders. Actually, it seems to be quite logical. To perform the stage of open innovation, the companies should have a flexible strategy to be able to handle it. The structure of defenders can hardly be suitable for this purpose. Vera and Crossan (2003) notice that the most successful innovation strategy can combine the elements of explorers and exploiters.

4.7. Summary and conclusions

The analysis of relations between innovative and strategic orientation of organisation shows that there is a link between two. Prospectors/ differentiation has to tend more to the product innovation, open culture and explorative approach while defenders/cost leaders are supposed to be more focused on process innovation, closed culture and exploitation.

Analysers /focus are supposed to inherit the features of both strategies combining for example both product and process innovation. They develop the ideas of prospectors for the market until more efficient defenders take over.

Reactors/"stuck in the middle" are supposed to be a strategic failure so it is strange to expect that they will be successful in innovation strategy since they even do not manage to come up with a rational business strategy.

While investigating strategy and innovation relation, it should be taken into account the extent to which strategic orientation corresponds to company's resources and capabilities (internal fit) and competitive environment (external fit). If the tool is chosen properly that it is possible to expect that a company is good at using its strengths to exploit opportunities and avoid the threats coming from the environment (Figure 4.3).

The left part of the scheme (Figure 4.3) is dedicated to the link between company's internal resources and capabilities, strategy and environment. The idea that internal resources and capabilities define the company's strategy corresponds to the resource based view (Hart, 1995) described in chapter 1. However, Porter's (1985) generic strategies are coming from the necessity to have some advantages in the competitive environment. So internal fit can be more associated with resource based view while external – with Porter's approach.

Innovation can be investigated in the frame of internal and external factors affecting it. For examples, open and closed innovation paradigms. Closed innovation's focus is developing internal for the company resources and capabilities to be able to foster innovation internally in the company. In the Figure 4.3, closed innovation is presented as an arrow coming from the company (emphasizes the use of internal knowledge and research base to foster innovation) through the closed tube to the product sold on the certain market C. Actually, the product was designed from the very beginning for the market C and the closed tube limits the exchange with the other companies until the product is introduced to the customer.

Open innovation paradigm assumes strong collaboration with external partners aiming at the development of innovative ideas. The company can "outsource" necessary steps during the innovation process. In the Figure 4.3, the tube with holes represents the open innovation paradigm. The idea of such graphical representation of the open innovation comes from Chesbrough (2006). The holes explain the fact that the innovative idea can come from the external sources but can be successfully (or not) adopted within a given company. Or the other way around, this particular company generates the idea which at the certain stage is considered as potentially not promising. The company can sell (or provide in any other way) the idea to the other organisations which can adopt it. So idea generated initially for market C can end up as a new product on market B or A. The companies can exchange not only ideas but cooperate at any stage of the product/process/service development.

Basically, to sum everything up, it is possible to distinguish between two main kinds of strategic orientation – innovative orientation links.

The first type is more proactive. It means pursuing prospector/differentiation strategy. It is an extremely innovative type using product innovation (product new to the market) to outperform competitors and gain first mover advantage. To innovate, such companies create a flexible structure which is very suitable for open innovation. Open innovation implies that the ideas generated by one particular company of that type do not necessarily end up at that very market for which they were designed. This approach is closer to exploration – to innovate it can be necessary not only to collaborate creating "strong ties" but also "weak ties" can be a brilliant source of new opportunities and information for fostering innovation. Potentially this type of strategy can be associated with a lower risk because each company can focus on its core competencies and resources. It assumes a labour division.

The second type is just the opposite. It pursues defender/cost leader strategy focused on cost efficiency. To become efficient this type of companies converts the production process in the "state of art" assuming maximum efficiency. For this reason, they use the process innovation. The hierarchic structure

of defenders/cost leaders is not designed for the open innovation. Such companies rely more on internal resources and capabilities development to innovate. It also assumes exploitation – collaboration with only “strong ties” because these companies do not have to innovate as heavily as prospectors/differentiation. The functioning of the defender/cost leader corresponds more to the Resource Based View.

The existence of these two polar types requires having the intermediaries. This role is normally played by companies pursuing analyser/focus strategy. They use market innovation to adapt for the specific consumers goods generated by prospectors/differentiators until the more efficient defenders take over.

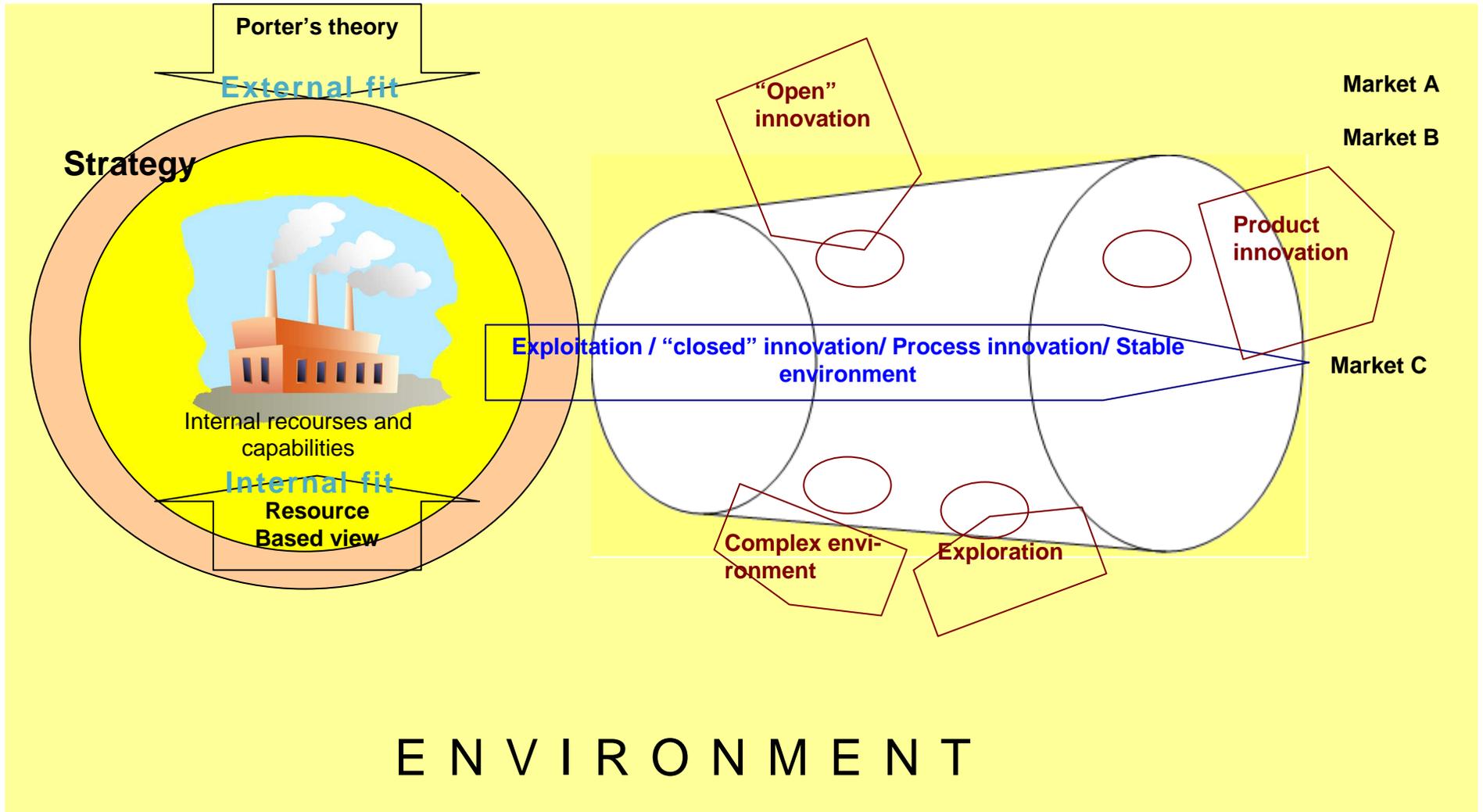


Figure 4.5. Integrated scheme

Chapter 5.

5.The relation between organisational strategy and environmental performance

5.1.Introduction

Any organisation nowadays is supposed to have an environmental strategy together with a corporate strategy. A number of studies linked the strategy to environmental performance. However, it is important to make a distinction between corporate strategy and functional (environmental) strategy. The chapter investigates the relation between corporate strategy and environmental performance considering the functional strategy as a mediating component. While looking for corporate strategy – environmental performance link it can be necessary to find how, actually, the corporate and environmental strategies are aligned.

Chapter 5 follows the research model as it is shown in the Figure 5.1.



Figure 5.1. The research model. Focus of Chapter 5.

5.2. Environmental (functional) strategy

The discussion whether it pays to be green or not for is answered by Hoffman (2000) in the following way: neither option can also be profitable but it is a matter of decision making. So every company needs an environmental strategy as a decision making tool.

Aragon-Correa and Sharma (2003) define environmental strategy as a “firm’s strategy to manage the interface between its business and the natural environment”.

Lawrence et al. (1998) state that the formulation of an environmental strategy is influenced by the following factors: industry, the natural resources an organisation uses, the environmental impact of product and processes, governmental influence, local and global community, etc.

Related to the industry, the environmental concerns in the organisation have a potential to influence the balance of five forces (Porter, 1998). Consumer preferences for eco-product can increase their bargaining power. If the company does not produce environmentally friendly goods, the risk of environmentally friendly substitutes rises and opens the gate for new potential entrants. On the contrary, being proactive in environmental strategy formulation can create barriers for potential entrants. It provides the benefits of experience curve, differentiation and lowers the effect of environmental legislation changes. The claim for “green” resources can also influence the relation with suppliers. The need for specific quality of resources stimulates the vertical integration lowering the bargaining power of suppliers. Being “green” can potentially decrease rivalry as far as it provides a basis for differentiation. Using comparative industry structure analysis tool the processes are described in Figure 5.2.

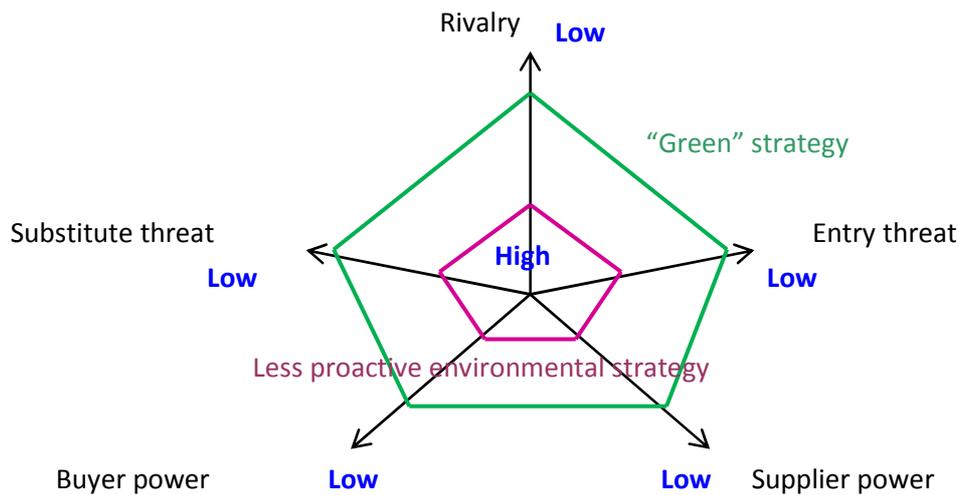


Figure 5.2. The comparative industry structure analysis (the analysis method adjusted from Johnson et al. (2008))

The scheme shows that coming from the less proactive to “green” environmental strategies, the five Porter’s forces raise their influence. The less proactive environmental strategies correspond to the less favourable industry conditions – higher substitute threat, entry threat, etc.

Many studies come up with different types of environmental strategies. They mostly represent the sequence of mutually exclusive development stages which companies follow. Roome (1992) distinguishes the following types of environmental strategy: non-compliance, compliance, compliance+ strategy and proactive strategy. From one type to another the strategy increases in pro-activeness. Non – compliance means that company is unable or unwilling to comply with environmental standards and regulation due to different reasons (costs of compliance etc.). Compliance is the simplest form of environmental commitment associated with irregular actions and an end-of-pipe approach. The company just tries to solve existing problems without looking forward. A Compliance+ strategy means that the company works out the environmental strategy to deal with environmental issues and align this strategy with a core business strategy. A proactive environmental strategy is perceived by Roome (1992) can be compared to the “best practice” which is a brilliant source for competitive advantage.

Gupta (1995) mentions the similar classification of how to integrate environmental care with manufacturing strategy which earlier was provided by Van Wassenhove and Corbett (1991). The following strategies are distinguished:

1. “Follower” – does not go beyond the compliance with the legal requirements and regulations
2. “Market - oriented” – business strategy driven by market conditions is the main and leading one while the environmental strategy playing the second role.
3. “Environment -oriented” - environmental strategy is of a major importance and business strategy and environmental strategy are completely integrated.

Steger (1993) distinguishes four generic environmental strategies: defensive, innovative, offensive and indifferent (Figure 5.3). They are formed according to the level of environmental risk and the potential for market opportunities through environmental protection for the company, Nowadays companies should opt for an innovative or offensive strategy because the market for “green products” is developing and the innovation is essential for competition. These strategies should be integrated with the corporate generic strategy: differentiation, cost leadership or focus.

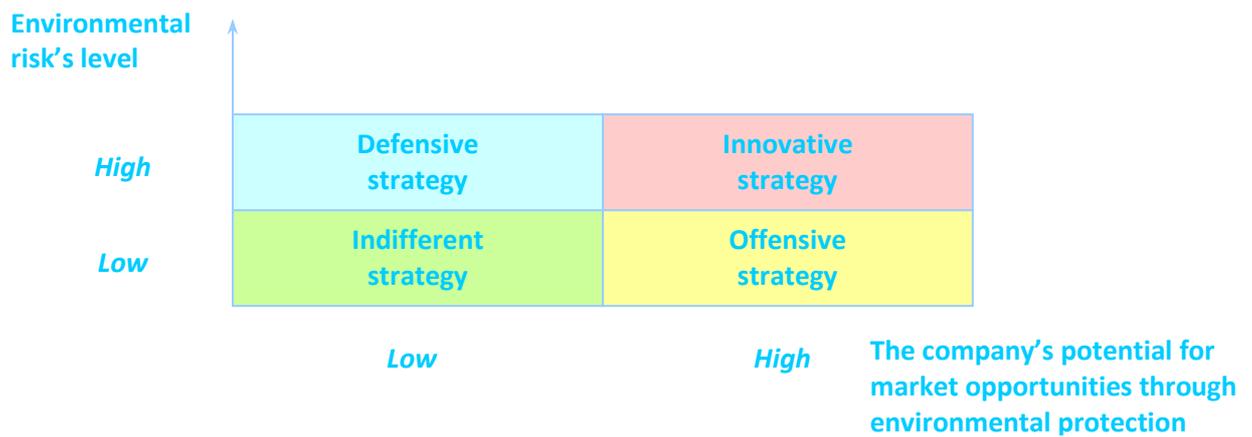


Figure 5.3. Steger's (1993) environmental strategies

Esty and Winston (2006) argue that environmental initiatives can be successful if environmental strategy is embedded in the overall business strategy. They come up with three main reasons to add an “environmental lens to core strategy”:

1. the potential for upside benefits means that companies who are “ahead of the pack” in environmental issues have opportunities to derive higher incomes, lower operational costs, decrease risks, lower costs of borrowing, increase the customer loyalty through being more entrepreneurial and innovative
2. managing downside risk – says that companies more proactive in environmental strategies can lower both financial and operational risk
3. value-based concern for environmental stewardship – assumes that companies perceiving environmental problems as “right things to do” and acting in the corresponding way in constant communication with the stakeholders get what Esty and Winston (2006) called “eco-advantage”.

5.3. Environmental management systems (EMS)

Choi et al. (2003) made an overview of a decision making process concerning environmental management issues. According to their study, environmentally conscious management tools include such concepts as EMS, environmental audit, eco-labelling, eco-design and quality management system.

Watson and Emery (2004) use the EC (1993) definition of EMS as a “that part of the overall management system which includes the organisational structure, responsibilities, practices, procedures, processes, and resources for determining and implementing the firm's overall aims and principles of action with respect to the environment ... Put differently, it encompasses the totality of organisational, administrative and policy provisions to be taken by a firm to control its environmental influence”. According to Singh et al. (2008), EMSs include “various objectives and standards for environmental performance, procedures for control and enforcement and a formal allocation of responsibilities among the employees and the functions”.

Gupta (1995) notices that an EMS can increase the competitiveness of the company better if it is fully integrated with other functional strategies (especially operational).

Coglianesse and Nash (2001) consider the companies which develop their own EMSs as the more proactive companies, as they go beyond a simple end-of-pipe approach. They state that if the initiative is developed ex proprio motu it brings advantages compared to the changes imposed by for example legal requirements. First of all, internal initiatives could be less costly and even more efficient. When the changes are not imposed they could be more innovative and more welcomed by the staff. The EMS can also influence the corporate culture making people aware of the link between business and environment.

5.4. The relation between the corporate strategy and functional (environmental) strategy – the problem of alignment and integration.

Klassen and McLaughlin (1996) state that corporate strategy determines the environmental management of the firm. Environmental management being a part of the functional strategy influences in return environmental performance. All these interconnections Klassen and McLaughlin (1996) represented as a model:

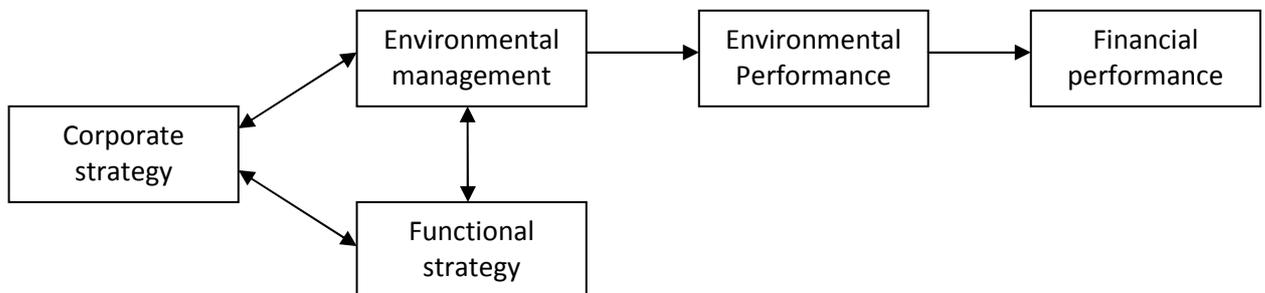


Figure 5.4. Model of linkage between strategy, environmental management and company's financial performance

Figge et al. (2002) point out the lack of integration as a major reason why companies fail to achieve high performance from the economic, environmental and social perspective together. Lawrence et al. (1998) see the success key in the alignment and integration of environmental and business strategy. Alignment is explained as “both strategies have equal weight within organisation” while integration is a broader concept assuming “the integration of activities that support strategic objectives”. They come up with two polar generic views on business and environmental strategy relation:

1. Business and environmental strategy are mutually exclusive/unrelated. The focus of business strategy is industry or industries where the company competes and its cost and income. While environmental strategy covers the whole natural world and the environmental impact of the company on it. So if the strategies are designed to face different problems they have different goals. Hence, they are simply unrelated.

2. Business and environmental strategy are mutually beneficial/ supporting. Firstly, even if the company does not have an environmental strategy, environmental consideration present anyway in the corporate strategy because of legislation the company should comply with, product differentiation (for “green” products) and the presence of “green” substitute products while environmentally friendly products are required by customers. Secondly, “many strategic business objectives can also have an environmental benefit, even though they are not directly labelled as environmental”. For example, efficient use of natural resources serves both strategic objectives: environmental – reducing the natural resources consumption and business – reducing costs.

Banerjee (2001) adopts the Schendel and Hofer's (1979) approach to the levels of environmental strategy integration (from the highest to the lowest): enterprise strategy level, corporate strategy, functional strategy and strategic planning level.

Not so many companies dare to encompass their enterprise and environmental strategy. In most cases the enterprise strategy assumes more pro-profit statements like consumer satisfaction, providing shareholder value, continuity, etc. If the company wants to integrate environmental strategy at this level, it should for example proclaim “green” initiatives in its mission statement.

Corporate strategy level assumes which products the company should produce, which technology to use and which business portfolio to compose. “Sustainable” companies can implement eco-design, save and clean technologies and “green” portfolios to integrate at this level.

A “sustainable” business strategy assumes that the business functions are performed in the environmentally friendly way. In other words, management focuses at “gaining competitive advantage

through environmental strategies”. The functional strategy level shows how the “green” initiatives reflect in various functions (e.g. marketing). The consequences can be changes in channels of distribution or ways of promotion. The strategic planning level considers the adjustment of activities in which the company participates to the “green” orientation of the company.

Hutchinson (1996) developed the criteria to assess the level of environmental and business strategy integration. As can be concluded from the summary below, these criteria are an operationalisation of what an integrated environmental and business strategy is:

1. the board states the integration of environmental and business strategy, has a clear view how it should be done
2. the health and safety of human stakeholders is more important than profit goals
3. eco-design of products
4. purchasing policy is adjusted to environmental goals (e.g. careful with scarce resources)
5. environmental policy directly affect operational activities
6. environmental savings are important for accounting and budgeting
7. environmental training for employees
8. environmental performance indicators are included in managers’ key performance indicators and etc.

The eighth aspect in this list is very important. The alignment and integration of environmental and corporate strategy necessarily has to be supported by management. Otherwise, it can cause agency problems and inefficiency. It is important to understand the role of environmental management in strategy formulation, communication and implementation.

Lawrence et al. (1998) consider TQM as a tool to link environmental and business strategy. Perceiving environmental friendliness as one of the quality dimensions, companies can align and integrate these two strategies.

Box 5.1. The theory of planned behaviour (Ajzen, 1991) applied to the managers’ behaviour

Applying the Ajzen’s (1991) theory of planned behaviour (figure 5.5) to the manager’s behaviour related to environmental problems can generate interesting results.

```

    graph TD
      A[Attitude towards the behaviour] <--> B[Subjective norm]
      B <--> C[Perceived behavioural control]
      A --> D[Intention]
      B --> D
      C --> D
      D --> E[Behaviour]
      C -.-> E
  
```

Figure 5.5. The theory of planned behavior (adjusted from Ajzen, 1991)

According to Ajzen (1991), the motives which define the intention to behave in a certain way are constructed of the attitude towards behaviour, subjective norms and perceived behavioural control. Actually, the attitude towards behaviour for managers can be transformed into some kind of cost – benefit analysis of acting in a sustainable way. Here can be really important to include environmental performance indicators into key performance indicators which define manager’s bonus. Subjective norms reflect the perceived social pressure to act sustainable. So high requirements of external stakeholders to sustainable development gives the managers extra incentives to opt for “green”.

Perceived behavioural control reflects the level of difficulty for the manager to act in a certain way. So the more is the manager’s power, the more support they get from the shareholders, the more opportunities they have to have “green” intentions.

In this case managerial intentions can be associated with a strategy which says how the company should act. Managerial behaviour shows the real actions corresponding to the strategy implementation.

5.5. The relation between strategic types and functional (environmental) strategy.

Aragon-Correa (1998) investigated the relationship between strategic proactivity and environmental approaches of the company. The basic idea is that companies with proactive strategies can deal with environmental issues in a more advanced and explicit way. Business strategies are distinguished based on Miles and Snow view. Prospectors are the most proactive; defenders just the opposite, the analysers in between.

This proposition is analysed at three dimensions:

- 1) Entrepreneurial – choices about products, markets and way of competing.

Prospectors - focus on new products and markets. So they can better design sustainable products and develop markets for themselves.

- 2) Engineering – technology used for developing competitiveness

Prospectors are again supposed to perform better here because:

- they are more supposed to invest in technologies that less proactive competitors who will invest also but later when the technology already proved
- The flexibility of prospector's technology flexibility allows them to respond better to the environmental challenges
- Prospectors are more experienced in innovations and marketing

Defenders focus on efficiency can better use natural environmental improvements in technological process.

- 3) Administrative – structure and organisational process allowing to reduce uncertainty and foster innovation

Decentralised structure of prospectors allows the involvement of all the necessary people. Significant R&D and marketing expenses also give more chances for the prospectors to perform environmentally better.

Enticott and Walker (2008) examine the sample of 72 public organisations and find out that following a prospector strategy can bring significant benefits in terms of environmental performance. It was also hypothesised that reactors were negatively associated with environmental performance. However, for reactors, empirical data could not generate significant results to support this proposition.

While investigating the environmental – business strategy relation, it is also important to mention the composition of company management. Aragon-Correa et al. (2004) investigated the presence of people directly responsible for environment in organisations with environmental performance. Strategic types according to Miles and Snow (1978) were taken into account as well. The findings show that the companies with the specific people responsible for environmental performance are better off as measured with environmental performance. While accounting for the strategy, it appeared that environmental performance of prospectors is significantly better than defenders'. Moreover, the environmental records of prospectors with environmental managers are much better than all the rest.

5.6. Conclusion.

The chapter investigates the place of environmental strategy in the strategic decision making process of the firm. A distinction is made between environmental strategy and environmental management systems.

The relationship between environmental strategy and the corporate strategy is examined considering the environmental strategy as a part of the general corporate strategy. The success of both is supposed to correspond to the level of integration and alignment of these two strategies.

The chapter investigates the relation between strategic types and environmental strategies. It follows that more proactive corporate strategies (such as prospector) are associated with more proactive environmental strategies, leading to the higher environmental performance. To complete the circle, it is already known from Chapter 3 that higher environmental performance leads to the higher financial performance (Figure 5.6).

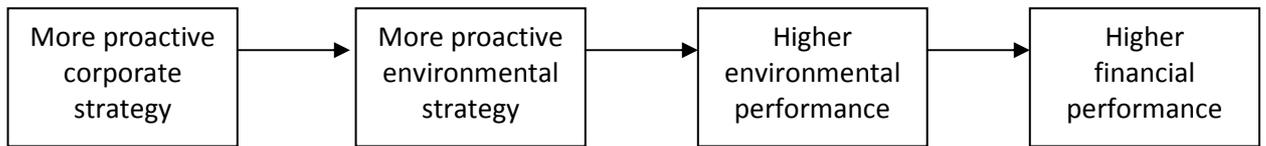


Figure 5.6. Model of linkage between corporate strategy, environmental strategy, company's environmental and financial performance

Chapter 6.

6. Conclusions and discussion

6.1. Introduction

The present chapter contains the results of the study which answer the posed general research question by answering the set of sub-questions, presents the discussion and possible directions for the further research.

6.2. Conclusions regarding the research sub-questions

How can environmental performance, innovation, strategy and sustainability be defined?

Chapter 1 presents the definition of environmental performance provided by Klassen and McLaughlin (1996). It “measures how successful a firm is in reducing and minimizing its impact on the environment, often relative to some industry average or peer group”.

The sustainability definition used in the present work is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” and is given by the World Commission on Environment and Development. Sustainability is investigated as a complex concept including three dimensions: economic, social and environmental. Nowadays, the balance among these dimensions is shifted to the economy part. So the society should influence the economy to reduce the impact on the environment and to redress the balance.

Chapter 1 gives the definition of innovation and Chapter 4 distinguishes among different approaches to innovation classification: process/product/market/organisational innovation (Schumpeter, 1982), explorative/exploitative innovation (Dittrich and Duysters, 2007) and open/closed innovation (Chesbrough, 2006). Chapter 1 provides the definition of strategy while Chapter 4 distinguishes among Porter’s (1985) generic strategies: cost leadership differentiation, focus and strategic positioning called by Porter (1985) as “stuck in the middle”. The classification of Miles and Snow (1978) is also presented. Miles and Snow’s strategic types - defender, prospector, analyser and reactor and associated with Porter’s (1985) differentiators, cost leaders, focus and “stuck in the middle respectively.”

How can environmental performance be measured?

While measuring the environmental performance, the studies investigated in the Chapter 2 focus either on environmental management systems as a policy or directly environmental performance measurement. The disadvantage of environmental management models is that they are difficult to operationalise. They mostly present a set of possible environmental strategies which companies can follow - with or without an overlap.

The indicators for environmental performance measurement used in recent studies are very diverse. The most integrated scheme of environmental performance measurement is provided by Bremmers et al. (2005). They define 9 groups of environmental performance indicators depending on the level of managerial focus and breadth of environmental involvement. All the approaches to environmental performance measurement investigated in the Chapter 2 were integrated on the basis of Bremmers et al. (2005) scheme (Figure 2.4). Most of the studies are concentrated on the indicators showing in-company environmental involvement from operational to strategic level of managerial focus (Hart (1995), Russo and Fouts (1997), Ilinitch et al. (1998), Azzone et al. (1996), ISO, EMAS). Ilinitch et al. (1998) and Azzone et al. go a little bit further and try to communicate the environmental initiatives and impacts with the stakeholders. They provide the indicators corresponding to the higher breadth of environmental in-

volvement (even till the level of network). Obviously, there is a lack of environmental performance measurement indicators corresponding to the supply chain or network level.

Anyway, most of the studies prefer while measuring environmental performance to take into account the impact of the single corporations – not the present state of environment. Indeed, the present state of environment is defined normally not by the activity of only one organisation but by the whole infrastructure in a particular area. Specific firms are not interested in the state of environment's measurement – it is a matter of institutions and etc. It implies that the studies and environmental standards accounting for the state of environment indicators (Kolk and Mauser, 2002) simply do not fit it in the scheme chosen as an integrating framework.

What is already known about the relation between environmental and financial performance?

There are three positions supporting the positive, negative and neutral relation between environmental and financial performance. Environmental investments can become profitable through cost savings and market share gains. Actually, most studies identified a positive environmental performance – financial performance relation. The positive link can be exercised by two ways - In spite of this, King and Lenox (2001) emphasize that many studies are missing longitudinal data. So a number of studies should be done - it takes several years – to come up with some more definite information about the nature of environmental performance – financial performance relation.

Indeed, most of the studies prove the positive correlation between environmental and financial performance. However, correlation does not mean causation. When the nature of the relation is not clear, it does not make much sense to derive the implications for the science and practice. The Table 3.2 represent an overview of the studies on environmental performance – financial performance relation and can give an impression about the present state of the research on the topic.

The question arises, what kind of the research should be done to find a plausible and significant explanation for the relation between environmental and financial performance. The clearest answer is provided by Schaltegger and Synnestvedt (2002) who consider that the research methodology should shift from establishing the environmental performance – financial performance correlation to the measurement of the effect of various environmental management models on eco-efficiency - “the combination of economic and environmental performance”. It is also mentioned that due to the complexity of relationship and the concepts itself it can be wise to go in depth with the case studies because they can potentially generate more information about causation – the mechanisms linking environmental and financial performance via innovative, strategic orientation, etc. However, the use of only case studies is not a perfect strategy. The chosen sample of cases can be strongly affected with the specific features of companies, their similarity or, the other way around, too diverse position regarding the environmental management strategies, etc. Hence, case studies could be successfully combined with the statistical research based on the large samples.

What is already known about the relationship between innovative orientation and strategic orientation of the organisation?

The analysis of relations between innovative and strategic orientation of organisations shows that there is a link between two. Prospectors/ differentiation has to tend more to the product innovation, open culture and explorative approach while defenders/cost leaders are supposed to be more focused on process innovation, closed culture and exploitation.

Analysers /focus are supposed to inherit the features of both strategies combining for example both product and process innovation. They develop the ideas of prospectors for the market until more efficient defenders take over.

Reactors/“stuck in the middle” are supposed to be a strategic failure so it is strange to expect that they will be successful in innovation strategy since they even do not manage to come up with a rational business strategy.

What is already known about the relation between organisational strategy and environmental performance?

The relationship between environmental strategy and the corporate strategy is examined considering the environmental strategy as a part of the general corporate strategy. The success of both is supposed to correspond to the level of integration and alignment of these two strategies.

Chapter 5 investigates the relation between strategic types and environmental strategies. It follows that more proactive corporate strategies (such as prospector) are associated with more proactive environmental strategies, leading to the higher environmental performance. To complete the circle, it is already known from Chapter 3 that higher environmental performance leads to the higher financial performance.

6.3. Discussion

The study shows that nowadays the analysis with the help of large samples, statistical research and correlation between environmental and financial performance is not enough to know the real nature of the environmental performance – financial performance relation. Quantitative studies very often respond positive or negative (mostly positive) signs of correlation but say that there is no 100% certainty that it is found what was really searched for. In other words, the validity of studies is quite weak because the theoretical base for the research is quite diverse - from “freehearted” optimistic (assuming positive effect on environmental protection on economic success) to rationally financial assuming financial benefit as a main criteria of managerial decision making. Cost – benefit analysis is a more realistic approach of dealing with environmental issues. However, these costs and benefits are quite difficult to identify. The concepts of environmental performance, financial performance, innovation and strategy are quite broad. As broad as the amount of factors that should be taken into account (such as the industry, the size, the quality of environmental management, the operationalisation of main variables etc.). So maybe it’s better to go in depth with more specific case studies or limit and differentiate the problem as, for example, King and Lenox (2002) did? The way out of the problem can be seen in the proposal of Schaltegger and Synnestvedt (2002) who advise to combine the case study approach to shed light on the theoretical base of environmental – financial performance relation and econometric studies to find out a tendency and general outcomes. They also propose the eco – efficiency as a dependent variable of analysis instead of an established sustainability – profitability formulation.

Choosing between environmental performance and financial performance is not necessary (Porter and van der Linde, Klassen and McLaughlin etc.). There is a possibility for companies to be profitable while acting sustainable going beyond existing environmental regulation. This idea is proposed by the theory of ecological modernisation introduced by the “Berlin Science Center” in 1980s. It says that nowadays the companies are exposed to the effect of additional risks in case of acting in a not environmentally friendly way. The economic risk rises because of “green” demand from the retailers and supply chain, the existence of “green” substitutes, environmental certification of competitors and price volatility on the natural resources used (energy, raw materials). Political and regulatory risk rises because of the regulation tightening as well. Societal risk increases because of the “green” demand from customers, scientific studies signalling the danger of the present ecosystem state, as well as campaigns in media against polluters. So to decrease this risk and to gain financially companies should go green. The pathway they should follow is ecological modernisation – a technology based and innovation – oriented approach to environmental policy (Janicke, 2008). Ecological modernization theory expects positive effect of technological progress (eco-innovation) and changing social and institutional relationships on the reduction of environmental impacts (Haverkamp et al., 2010).

Environmental innovation is a supporting mechanism for environmental capabilities adoption. However, according to managers’ (especially of SME) perception it can hardly ever contribute to financial performance (Haverkamp et al., 2010). So there is a need for intermediaries who are supposed to be able to bring together social and financial motives (Mol, 2000) through co-innovation projects, promotion of differentiated eco products, etc. (Prakash, 2000; Peattie and Cranne, 2005; Bergstrom et al., 2005).

Innovative and strategic orientations are revealed to be linked to the sign of environmental performance – financial performance relation. Chapter 4 established the link between innovative and strategic proactiveness of organisations. It is shown that companies opting for more proactive strategies

(prospectors/differentiators) are associated with open/ explorative/product new to the market innovation. While companies with defensive strategies (cost leadership according to Porter) tend to closed/exploitative/process innovation. Taking into account the fact that in general prospectors financially outperform defenders (Zajac and Shortell, 1989), it appears that open/explorative/product innovation can indeed lead to a more favourable financial position.

Linking strategic orientation to environmental performance, it is necessary to account for the presence of environmental strategy and the level of its integration and alignment with the corporate strategy. The high level of integration leads to the higher environmental performances which in return generate the higher financial performance. The relation between environmental and financial performance should be necessary related to the risk. On the one hand, the environmental risk should be controlled. On the other hand, there is an optimum between environmental care costs and financial returns on these costs. However, the risk factor is not really presented in the present paper. It can be a topic for a new research.

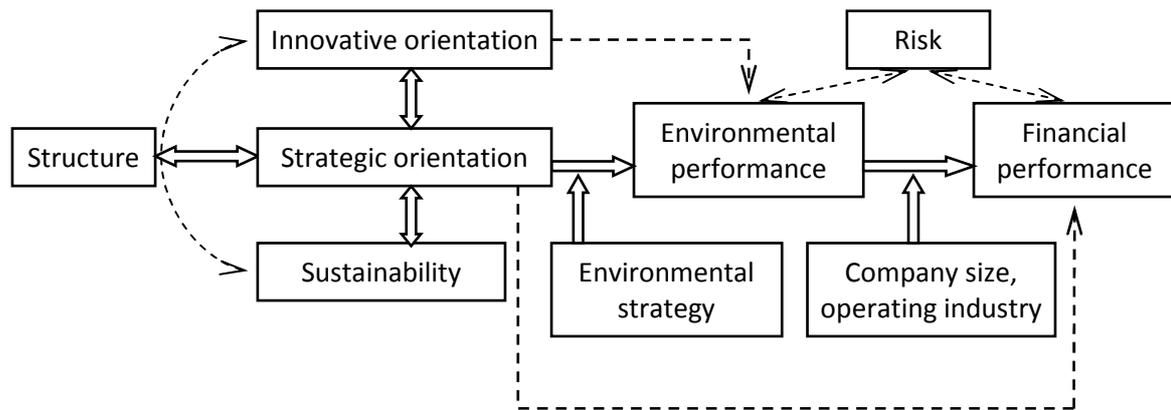


Figure 6.1. Integrated research model.

The further theoretical research can account for the relations between innovative orientation and environmental performance. The link between innovative orientation and sustainability can also be investigated. The nature of the link between strategic orientation and financial performance can be included to complete the model.

Based on the conducted literature study and derived integrated research model, the further empirical research can test the following hypothesis:

H 1. Environmental performance affects the organisational financial performance. To be more specific, organisations with higher environmental performance are associated with higher financial performance, and conversely, low environmental performance leads to the lower financial performance.

H 2. Prospectors acting environmentally friendly should financially benefit from market gains, while defenders – from costs savings.

H 3. Prospectors/differentiators opt for open/explorative/product innovation while defenders prefer closed/exploitative/process innovation.

H 4. Prospectors have a higher environmental performance than defenders.

H 5. Prospectors have higher financial performance than defenders.

H 6. The company size significantly affects the environmental performance – financial performance relation.

H 7. The operating industry significantly affects the environmental performance – financial performance relation.

The present study investigated only the measurement approaches to financial and environmental performance. As for the environmental performance, the most general and full framework for the indicators is provided by Bremmers et al. (2005). Almost all the indicators used in the other studies can be

put in this framework. Financial performance indicators should include both accounting and market based indicators. The combined use of both accounting and market based indicators can help to overcome the limitations of both groups of indicators. For example, market based indicators are influenced by too many factors except environmental performance. It makes difficult to assess the effect specifically of environmental initiatives on market value. Moreover, market values represent the market expectations which are not the exact measure. The measures of financial performance should also include a risk dimension because the higher the risk is, the higher the return is. This aspect can be especially interesting for the managers. Actually, the managers care more about the performance. If the manager's focus is financial performance then the diverse strategies related to environmental risks can be pursued: the risk can be accepted, transferred to another party, avoided, the negative effect of the risk can be reduced, etc.

The further theoretical research is needed to decide upon the operationalisation of other concepts.

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Mintzberg about the structure's role

Henry Mintzberg (1980) came up with a typology of basic organisational structural configurations defined on the basis of four groups of organisational structuring elements:

1. The basic parts of organisation:

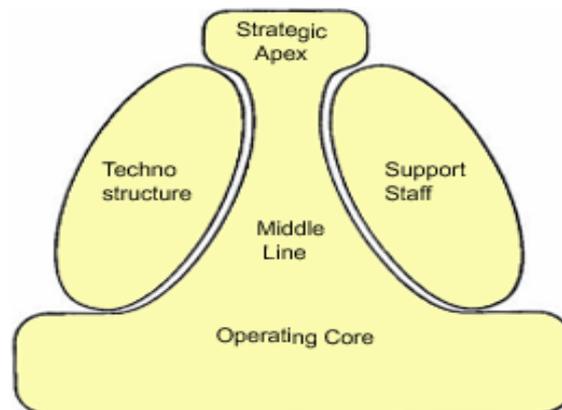


Figure. Basic parts of the organisation according to Mintzberg (1980)

- the strategic apex – represented by the top management and their assistants
- the operating core – represented by employees directly involved in the core product / service production and their direct assistants (operational activity)
- the middle line – the middle management linking the strategic apex and the operating core
- the technostructure – analysts enabling the design and maintenance of the structure (e.g. accountants, etc.)
- the supporting staff – indirect support to the rest of the structure (e.g. public relations, catering, etc.)

2. The coordinating mechanisms :

- direct supervision – one person coordinates the work
- standardisation of the work process – the coordination is provided through the standardisation of the working process itself (regulation is going from the technostructure part)
- standardisation of outputs – the coordination is provided through the output standardisation. The standards are developed by the technostructure employees
- standardisation of skills – coordination is provided through skills and knowledge standardisation
- mutual adjustment – coordination is conducted by the employees themselves through informal communication

Mintzberg (1980) points out that the organisations using standardisation as a coordination tool are bureaucratic while those emphasising direct supervision and mutual adjustment fit more in the concept of organic structure.

3. The design parameters:

- job specialisation – is defined by horizontal (the number and breadth of task for the given

post) and vertical specialisation (control over the task). The higher the specialisation is, the more the job is “unskilled”. Low level of centralisation corresponds to job what Mintzberg (1980) calls a “professional” behaviour formalisation – the job is standardised through the rules, policy, instructions, etc.

- training and indoctrination – use of educational programmes normally outside the organisation as a tool to standardise skills and knowledge
- liaison devices – tools enabling mutual communication across units
- vertical and horizontal decentralisation, unit size, unit grouping, planning and control systems.

4. Contingency factors: technical system, size, age, power, environment.

Each configuration revealed by Mintzberg (1980) emphasizes one specific coordination mechanism and uses the other structural elements in a specific way.

The *simple structure* uses mainly direct supervision coordinating a vertical line. Actually, organisations with simple structures are characterised with a minimal participation of horizontal axes - technostructure and supporting staff. Direct supervision is mainly conducted by one or a few top managers. So the strategic apex is favourable. According to Mintzberg (1980), strategic apex pulls a centralisation, so there is no big need in the unit grouping. There is a loose control, low formalised behaviour, limited use of the training and liaison devices. Such a structure corresponds to the simple and dynamic environment. Simple environment seems to be an appropriate field for a single or a few top managers. Dynamic environment cannot be coordinated by standardisation (like for example machine bureaucracy). Simple technical system adopted by simply structured companies also does not require a highly formalised structure. The simple structure is mostly associated with young and small organisations (e.g. entrepreneurs)

The *machine bureaucracy* relies on the working process standardisation as a coordinating mechanism. The standards are developed by the employees constructing the technostructure which pulls standardisation and formalisation of routinised operations. Standardisation is essential to control the operating core. At the operating level the functional units are large. The machine bureaucracy structure mostly fits for the mature large companies with mass production technical systems. Companies adopting this type of structure are designed to function in a stable and simple environment. High level of standardisation and “heavy” structure are not advantageous in the dynamic environment. The high level of specialisation implies simple operating tasks which do not correspond to the complex environment.

The *professional bureaucracy* is based on the coordination of skills as a coordination mechanism. The specific of this structure is that the core level is constructed from the highly educated specialised employees – professionals who need an extensive training to maintain the high professional level. They are provided with a high autonomy with respect to the strategic line and the other professionals. It implies the low level of formalisation. The structure is decentralised. Hence, the already mentioned standardisation of skills is used to coordinate. It extensively relies on the liaison devices. The power is concentrated in the operational core. The companies adopting professional bureaucracy structure are designed to operate in the stable but complex environment. The acquired and maintained by training education of employees enables the companies of this type to operate in the complex environment. However, if the skills and knowledge are already set, they are supposed to be used for quite a long time assuming the stable environment. The age and size do not matter in this case.

The *divisionalized form* is described by Mintzberg (1980) as a “limited, parallel form of vertical decentralisation, with the middle line emerging as a key part of organisation”. Indeed, the company which adopted the divisionalized form is the number of relatively independent divisions. It automatically implies the coordination problem. Within the given case, the coordination issue is solved through the output standardisation. The middle management role is really important to align the goals of divisions with each other and with the top management’s targets. This structural type is normally chosen by large and mature companies.

The most untypical structure in this list is an *adhocracy*. The highly educated specialists from the different functional units allocated into the teams for specific project's sake. The professionalism of the personnel is maintained through the extensive training. The teams extensively use the mutual adjustment as a coordination tool. The technical systems are sophisticated and automated which requires the supporting staff to be of a high importance. Such a decentralised scheme without a clear power concentration relies on the liaison devices for communication. The companies adopting this structural type are typically young and operate in a both complex and dynamic environment.