Impact Measurement and Performance Analysis of CSR (IMPACT)

WP2: Econometric Analysis

Final

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Contents

1 INTRODUCTION

This report presents the results of work package 2 (WP2). The purpose of WP2 is to collect data on CSR on a very large scale and use these data to analyse the links and impacts of CSR on competitiveness, ecological sustainability and quality of jobs.

1.1 Contributions to the IMPACT project

Currently, there are several systematic databanks of CSR in large companies. Two of the databanks (Sustainalytics and ASSET4) will be employed in WP2. These databanks are not just limited to best practices and are therefore very useful for large scale econometric analysis. However, no similar systematic databank yet exists for SMEs. To fill this gap, WP2 sets out to also collect new data on CSR and innovation of SMEs in Europe. This will be a first step to extend existing data bases in order to facilitate more comprehensive and representative information.

The collection of large data sets and the econometric analyses provide an important contribution to the IMPACT project. First, whereas other parts of the IMPACT project mainly focus on large companies, WP2 analyses both large companies and SMEs and allows a comparative analysis. Second, the development of a rich set of CSR of SME's in Europe provides insight into the drivers and CSR performance of SMEs that is much more representative than case studies (or any other studies in the past). As a follow up to the RARE project, which analysed 49 companies in Europe, the EU is in need of getting a more representative picture of CSR in Europe, its determinants and the impact on sustainability on the macro level and diversity between and within sector level. For that purpose, we need large numbers of data covering CSR in various European countries. Third, the large sample will enable us to empirically disentangle the complex relationships hypothesized in the conceptual framework of the IMPACT project. The large data set generates a sound basis for quantitative research on the relationships between CSR drivers, CSR response, CSR performance and CSR impact. Whereas case studies allow qualitative insights in why and how companies pursue CSR policies and how these affect sustainability, the low number of observations makes it impossible to derive generalized insights. In contrast, the high number of observations in the econometric analysis allows controlling for and simultaneous analysis of many variables that affect CSR, thus providing more exact knowledge of the relationships between the variables of interest.

The econometric research will focus on the following sets of research questions:

1. What internal and external factors drive CSR in large companies and small companies? Do we find differences for large and small companies and for different sectors and/or countries?

2. What is the relationship between various dimensions of CSR commitment and implementation and various dimensions of CSR performance that are related to EU sustainability and Lisbon goals, such as innovation, competitiveness, diversity in employment and CO2 emission? Are there differences for large and small companies and for different sectors of industry and different countries?

3. Can we identify a relationship between various types of innovations related to CSR (organisational as well as technical) and economic performance of firms?

4. Can we identify a relationship between aggregate CSR indices and the attainment of EU goals at the macro level?

Finally, WP2 strengthens the involvement of large companies and SMEs in the IMPACT project by providing those companies that cooperate to the research with a feedback module to be developed by Centerpanel.

1.2 Contents

The contents of this report are as follows. Section 2 describes how the various studies performed in WP2 fit in the overall conceptual framework of the IMPACT project. Section 3 describes the set up of the surveys and the outcomes of two surveys among large companies and among SMEs that are performed by WP2. Section 4 describes the existing datasets of CSR ratings and innovation that are used in WP2 (Sustainalytics and ASSET4) and compare their methodologies. Sections 5-8 report the outcomes of the econometric analyses of the drivers of CSR, CSR performance, the relationship between CSR and innovation and the (meta) impact of CSR, respectively. Section 9 concludes with a short overview of the main results and policy implications.

2 CONCEPTUAL FRAMEWORK

The overall conceptual framework of the IMPACT project has been extensively described in Work Package 1 (WP1). Application of this framework to the econometric analyses requires a focus on subparts of the overall framework, because an integral econometric analysis of the whole framework would be too complex and hindered by data limitations. In this section we describe how the various econometric analyses fit in the overall framework of the IMPACT project.

2.1 The IMPACT framework

The overall IMPACT framework is depicted in Figure 1.[1] It is designed to measure a multi-level analysis of the CSR impacts in each of the four impact categories found in the Lisbon and Gothenburg strategies: Competitiveness, economic growth, quality of jobs and ecology. The design allows for the comparison of impacts according to territorial and political level (EU, National, Regional), at sector level and by type of company (Small, Medium, Large, Multi-National). The framework recognises that the company and its stakeholders operate in internal and external environments which shape CSR motivations as well as the nature of the CSR Performance within companies, which in turn informs the CSR impacts on the meta level. The basic research question that is behind this framework is whether CSR response and performance will effectively contribute to sustainability at the meta level.

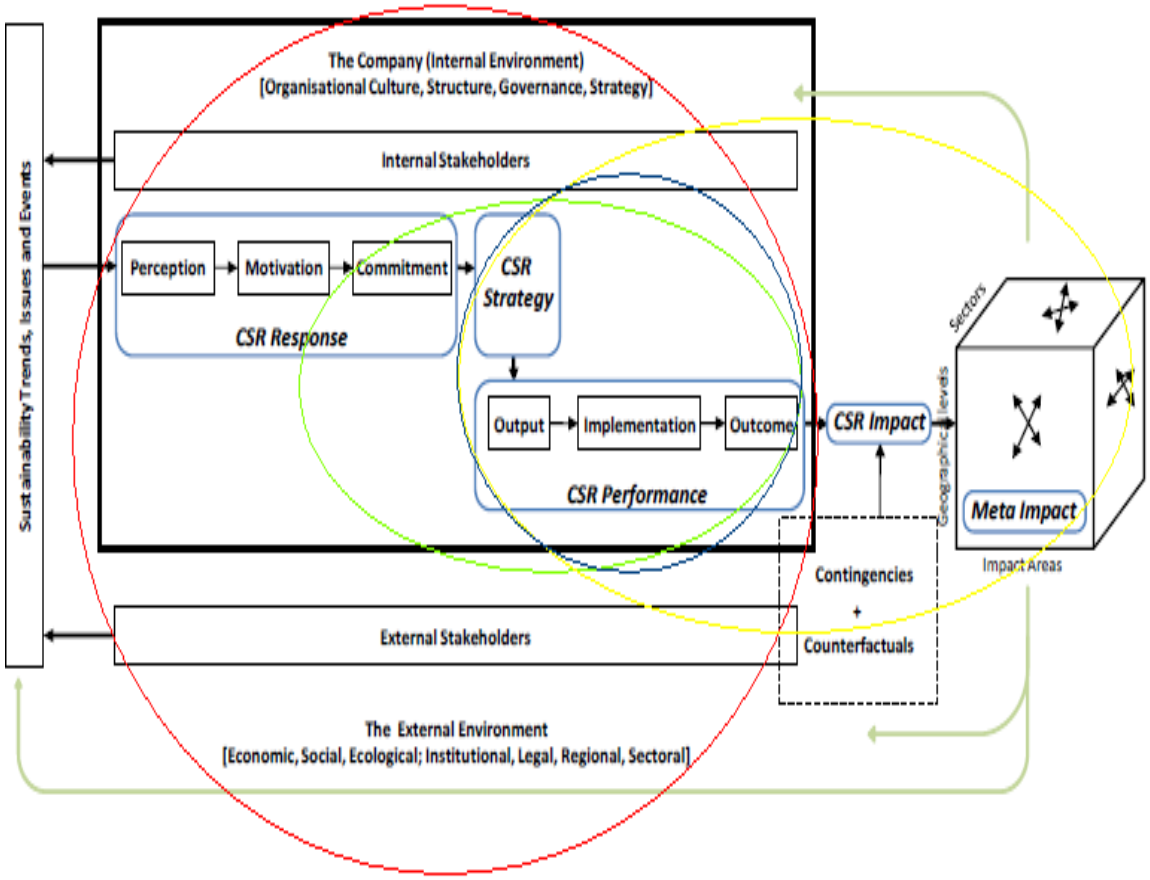
The company internal environment can be conceptualised as combining its organisational culture, structure, governance, and strategy. The organisational culture refers to the established norms and standards of behaviour. The structure refers to the organisation and relationships of personnel within divisions and groups. The governance refers to the allocation of power and the operation of accountability within the company. The strategy refers to the company's objectives and selected means of achieving these. Internal stakeholders include the company owners or shareholders, managers and employees at large.

The external environment of companies can be conceptualised as combining economic, social, ecological and institutional factors which can also be differentially structured by regional and sectoral factors. The external stakeholders include a range of actors and organisations which can affect the company.

The internal and external environments inform the sustainability trends, issues and events (TIEs) that the company faces. Trends concern relatively long term phenomena from consumer preferences to climate change. Issues refer to items which have some sort of agenda status in the society, most obviously salience in the media, in public opinion and NGOs, and in political organisations. Events are rather more proximate, one-off, phenomena but these might acquire more enduring salience depending on how companies and their stakeholders respond to these.

The CSR response indicates how a company responds to the TIEs and comprises CSR perception, CSR motivation and CSR commitment. The CSR perception refers to the way in which sustainability TIEs are understood, particularly in terms of their salience and centrality to the business. The CSR motivation refers to the type of motivation. The CSR commitment refers to the stated CSR policy or programme.

Figure 2.1 Overall IMPACT framework



The CSR perception, motivation and commitment provide stimulus to the CSR performance at the company level. CSR performance includes four main inter-related elements: Strategy, output, implementation and outcome. CSR strategy combines the companies' intended goals inherent in the commitment and the selection of means to achieve the goals, intended sequencing and direction. The CSR output refers to the resources and instruments dedicated to the CSR Commitment. CSR implementation refers to the way that the strategy is applied and how the outputs are deployed. CSR outcome refers to changes in corporate practices at the respective issue level and for the whole company.

The CSR outcome should lead to CSR impact, which reflects the system wide level impact of CSR in terms of geographical level, sectoral spread and impact outside the company.

2.2 Drivers of CSR

In WP2 several empirical studies have been performed to analyse the research questions presented in section 1, each focussing on a subset of relationships distinguished in Figure 1. The red area reflects the locus of the research into the drivers of CSR (research question 1). Its focus is on the influence of internal and external environment and stakeholders on the CSR response of companies and how this response affects CSR performance of the company. The right part of

Figure 1 concerning the (meta) impact of CSR performance is beyond the scope of this research. Furthermore, because of lack of data, sustainability trends, issues and events are not explicitly analysed, but implicitly by analysing the factors that influence them (internal and external business environments and stakeholders).

Table 2.1 specifies the type of factors included in the model on drivers of CSR in more detail and how they relate to the concepts distinguished in (the red area of) Figure 1.

Table 2.1 The model of drivers of CSR

Variable in IMPACT framework	Corresponding factors in model of drivers
CSR performance (comprises CSR commitment, CSR output, CSR implementation and CSR outcome)	ESG rating of Sustainalytics (large companies) / overall CSR rating based on survey outcomes (SMEs)
CSR response (comprises perception and motivation)	Strategic motivation
	Legal motivation
	Intrinsic motivation
The company (Internal environment)	Organizational culture
	Time horizon
	Size
	Slack resources
	Age distribution
	Skill level
Internal stakeholders	Response of employees to CSR of company
External stakeholders	Response of capital market to CSR of company
	Response of product market to CSR of company
	Response of labour market to CSR of company
The external environment	Competitiveness
	Market position
	Position in the chain
	CSR Information by industrial associations
	CSR Information by business schools
	Government regulation
	Monitoring of CSR of company by NGOs and media
	Degree of internationalization
	Region
	Sector

The model of CSR drivers explains CSR performance by CSR motivation, internal environment and stakeholders and external environment and stakeholders. The CSR performance includes CSR commitment (as this is part of the overall ESG ratings of rating bureaus). The model assumes that internal and external environments (and respective stakeholders) influence the CSR motivation of the company and that both shape the CSR performance.

In the econometric analysis on CSR drivers, we measure CSR response by motivation. Scholars have distinguished several types of CSR motivations. The first motive, the financial-strategic

motive, refers to the 'business case' argument (Berger et al, 2007). The benefits that firms may attain from engaging in CSR activities derive from various sources, such as cost and risk reduction, improvement in reputation and innovative capacity. The second motive, the legal motive, refers to compliance to or prevention of regulation. Organizations that integrate CSR in their policies may be more successful to avoid excessive regulatory intervention and meet existing regulations (Berman et al., 1999; Porter and Kramer, 2011). The third motive refers to intrinsic motivations, for example when executives perceive CSR as a responsibility of their firm (Graafland and Mazereeuw, 2012). That means, CSR is perceived as an end in itself because people are concerned about social problems or derive meaning from CSR. For example, people within the firm may be concerned in the sense that they perceive CSR as a moral duty of their firm (Graafland and van de Ven, 2006). CSR can also be intrinsically motivated by altruistic motives. In that case, one is concerned about social problems or derives meaning from CSR because one has internalized the welfare of others as part of one's own happiness. Another reason why managers would care about CSR is that they experience a 'warm glow' from helping others.

The internal company environment comprises company specific elements, namely organizational culture, time horizon, company size, slack resources and age and skill distribution of employees. Linnenluecke and Griffiths (2010) reason that companies with a so-called open systems business culture, that combines a flexible management style with external orientation, may more proactively apply corporate sustainability practices and are most likely to innovate for achieving ecological and social sustainability. Research by Berger et al. (2007) confirms that companies with comparatively flat hierarchies and an open attitude to external stakeholders more often pursue CSR policies in a broad range of areas. Another element of the internal business environment is the time horizon used in financial decisions. In the short term, investments in CSR may be very costly to a company. The benefits from investments in CSR often become only visible after a considerable period of time. CSR will therefore be more valuable to companies with a long time horizon (Francois and Roberts, 2003). CSR is also affected by company size (Jamali et al, 2008; Laudal, 2011). Small companies differ in many respects from large companies. They are often privately owned and managed by their owners (Spence, 1999; Jenkins, 2009). The policies of smaller companies therefore tend to reflect the values of the managers (European Commission, 2002); Lepoutre and Heene, 2006). This may also affect how a company deals with CSR. Furthermore, CSR is related to the availability of financial resources (Waddock and Graves, 1997; Orlitzky et al, 2003; Orlitzky, 2008). Slack resources theory predicts that the availability of slack (financial and other) resources provides a company with more opportunity to invest in CSR. Firms that are in financial trouble may lack the resources to invest in CSR related activities. Furthermore, age distribution and skill level may influence CSR (Luthar et al. (1997).

The responses of employees to the CSR of a company reflect the element of the internal stakeholders in the IMPACT framework. CSR policies may have favourable effects on the quality of the working force. A good CSR policy may lead to more trust in the company, higher commitment of the employee, lower absenteeism and turnover, higher profitability and productivity, more favourable job attitudes and behaviours and less misconduct of employees (Robinson and Dechant, 1997; Berman et al, 1999). The more investments in a good HRM reputation pay off, the stronger the incentive for the company will be to set up such a program.

Besides internal stakeholders, also external stakeholders influence the CSR of companies on various markets. There is substantial evidence that companies are penalized in the financial markets for behaviour that may harm the interests of investors (Rao and Hamilton III, 1996). On the product market, goods with a high social value that serve the interest of the society at large may generate a quantity premium and an extra price premium, if customers care about the broader societal impact of the company's operations (McWilliams and Siegel, 2011). Customers may punish companies if they directly damage customer's interests, for example by providing low quality. A good social reputation may also impact the price of the product (Auger, 2003). On the labour market, it is increasingly common for recruits to take into account the CSR profile of the company. There is indeed empirical evidence that companies with a good HRM reputation are able to attract better employees. This especially holds for companies that target at highly educated workers. As a result, the CSR of the company will influence the ability to attract highly qualified employees (Albinger and Freeman, 2000).

The external environment comprises several institutional factors characterizing the social economic environment of the company. First, the competitive environment will affect the opportunities for CSR. If companies are operating in a market where price competition is very fierce, the profit margins will tend to be low. As a result, these companies have less financial resources to make CSR related investments of which the revenues only accrue in the long run (Van de Ven and Jeurissen, 2005). Besides price competition, companies also compete by innovation (Vickers, 1995). This type of competition may provide a positive impulse to CSR, insofar CSR is a means to innovation that distinguishes the companies from other companies. Also the company's position in the chain and market position potentially influence CSR. Companies with direct consumer-relations and especially those with brands that they want to protect are particular vulnerable to public advocacy campaigns and therefore more inclined to pursue an active CSR policy (Brown et al. 2010). Market leaders naturally receive more attention from NGOs and media and will therefore be more aware of the importance of CSR. CSR can also be strengthened by industrial organizations or business schools. As members of employer organisations interact more frequently with their peers, they are more likely to develop a long term view on their business and interests (Campbell, 2007). Industrial associations can stimulate individual companies to CSR by developing a common norm for the companies in the branch, distribute information on CSR and provide CSR tools fitting the needs and context of the companies. Besides employers' organisations, companies can cooperate in networks that are aligned to business schools. Business schools may provide information and training that form the mindsets of executives. Fligstein (1990) found that corporate executives' management styles were dependent on the type of training they received in business schools. An important factor that conditions CSR of companies is transparency in information about CSR. Transparency in CSR depends on formal as well as on informal institutions. On the one hand, governments can stimulate transparency in CSR by regulation (Dubbink et al, 2008). For example, the government can force companies to publish information about environmental and labour issues in their annual report or foster the growth and professionalization of CSR rating bureaus by laying down certain CSR information requirements and quality standards. An important informal institution is the presence of NGOs or media that actively monitor the CSR of a company and can have a decisive impact on the reputation of a company (Graafland and Smid, 2004). The more companies are subject to the monitoring of NGOs, the more they will be pressed to translate their need for a good reputation into CSR policies that adequately prevent social or ecological incidents. Also the press may independently operate as a watchdog of the company's social responsibility.

Furthermore, CSR is affected by the degree of internationalization and the region in which the company operates (Brown et al, 2010). Companies that operate in global networks have to deal with large differences in welfare between the regions where they source their products and the regions where they sell their products. These companies are therefore more often confronted with severe social problems and a lack of government institutions that correct these social problems. Companies located in regions characterized by extensive welfare state and regulation will be less inclined to take up social responsibility because government regulation and the role of unions are stronger (De Geer, Borglund and Frostenson, 2010). CSR will remain more implicit and result from mandatory requirements (Matten and Moon, 2008). Finally, CSR will be affected by the sector in which the company operates, because the nature of the production processes or products determines the extent of social and environmental externalities that a firm creates. For example, companies in the construction sector particularly take care of the safety and health aspect of CSR, because of the nature of the building process. For chemical industries environmental issues are very important. For textile, child labor and other social issues in the supply chain are a focal point (Graafland, 2002). Also the incentive to pursue an active CSR policy may differ for different sectors, as the reputation mechanism varies among sectors. Brammer and Pavelin (2006) find that environmental performance affects reputation positively in none but the chemicals, consumer products, resources and transportation sectors. Three of these sectors are commonly identified as industries with salient environmental issues.

2.3 CSR performance

The green area is the locus of the research into the links between CSR commitment and CSR performance (research question 2). Its focus is on how CSR commitment influences CSR output and (issue specific) CSR implementation and how these measures are related to CSR outcome. The question is whether the implementation of CSR policies, programs and management systems really contributes to sustainability at the individual company level. The model assumes that if a company commits to CSR, it has a strong motive to dedicate resources to CSR instruments in order to integrate it in the organizational procedures and implement CSR at the concrete issue level to secure that the outcomes cohere with its commitment. Otherwise it runs a high risk that the company practice is found to be opposite to the company's commitment and this will negatively affect the company's reputation. We therefore expect that a higher level of CSR commitment positively influences the CSR output and CSR implementation on the issue-specific level. Subsequently, the issue-specific implementation will result in improved CSR outcomes in the triple P dimensions. Table 2.2 specifies the type of factors included in the model of CSR performance in more detail and how they relate to the concepts distinguished in (the green area of) Figure 1.

Table 2.2 The model of CSR performance

Variable in IMPACT framework	Corresponding factors in model of CSR performance
CSR commitment	Policies, codes of conduct and memberships
CSR Output	General organizational instruments
Implementation	Issue specific effort or programs
Outcome	Absolute levels and/or changes in environmental, social and economic outcomes

The CSR commitment refers to the stated CSR policies and codes of conduct and formal memberships of CSR initiatives. Especially for small companies, the CSR is also embodied by the leaders of the organisation. A good indication of the commitment to CSR is therefore that the director or a member of the board explicitly takes responsibility for CSR (Graafland, van de Ven and Stoffele, 2003).

CSR output refers to the resources and general organizational measures or instruments to integrate CSR in the company's organization. These general organizational measures can therefore be considered as a manifestation of a company's CSR commitment. Examples are CSR training of managers and other employees, CSR related remuneration or the use of several tools developed by CSR training institutes (like CSR score cards or other assessment tools). When firms grow larger, companies can use management and reporting systems. Management systems can be divided in management systems regarding environmental issues (e.g. ISO14001, EMAS, Greenhouse Gas Protocol) and social issues (e.g. SA8000). The ISO14001 standard deals with environmental management systems (EMS). The Greenhouse Gas Protocol (GHG Protocol) is an international accounting tool to understand, quantify, and manage greenhouse gas emissions. Besides the use of management systems, reporting on CSR is a measure the company can take to enhance its dialogue with the external environment (Graafland & Smid, 2004). Finally, companies can participate in relationships with external stakeholders. Examples are an active dialogue with NGOs, cooperation with other companies in the supply chain, partnerships with professional training institutes (technical schools, laboratories, etc.), and participation in local initiatives of governments or social organizations to achieve CSR objectives.

Issue specific CSR implementation refers to the way in which CSR output is actually deployed by the company at the issue specific level. This is expressed by the implementation of concrete measures on various social issues (like workforce diversity) and environmental issues (like GHG emissions and renewable energy). By introducing programs and targets, the company enables the management of a specific CSR issue by also formalizing and quantifying it. By reporting on a specific CSR issue, the company enables outsiders to check the implementation and thereby creating an extra incentive to perform well on that CSR issue.

The implementation of CSR is expected to lead to a favourable CSR outcome. The outcomes of CSR refer to the realization of CSR goals on the firm level in the three dimensions: social, environmental and economic. There is much literature on the relationship between CSR implementation and the financial performance of companies (e.g. Beurden and Gössling, 2008; Margolis, Elfenbein and Walsh, 2007; McWilliams and Siegel, 2000; Orlitzsky, 2008; Orlitsky, Scmhidt and Rynes, 2003; Waddock and Graves, 1997). But good financial performance of companies is just one of the three dimensions in which a socially responsible firm creates value. Research on the effect of CSR implementation on the environmental and social aspects of CSR is scarce (Friedman and Miles, 2001; Ammenberg and Hjelm, 2003; Joo, 2003).

2.4 CSR, innovation and financial performance

The blue area is locus of the model of CSR and innovation and the effect on financial performance, which is the focus of the research question 2 in the DoW.

The connection of CSR and innovation has not been extensively examined yet. Empirical studies specifically examining the relationship between CSR and innovation are rare. While the

connection of CSR activity and the financial performance of a firm is subject of several empirical studies (see for an overview Orlitzky, Schmidt, and Rynes 2003 or Margolis, Elfenbein, and Walsh 2007), including innovation in this context is not a common research practice.

The empirical research on the drivers of the financial performance on an accounting-based approach is well established (see Ravenscraft 1983; Schmalensee 1988; Allen and Hagin 1989). This means in turn that the traditional drivers of profitability have to be taken into account (such as e.g. a competitive environment) when the influence of CSR on the financial performance of a firm is analysed. A recent study by Czarnitzki and Kraft (2010) considered innovation in their empirical model on financial performance. They found a strong positive effect of innovation output in form of patent stock on the profitability of a firm, but not such an effect of innovation input measured as R&D expenditure (Czarnitzki and Kraft 2010). These results show that innovation should be included in the explanation of firm's financial performance. The importance of innovation as a factor of determining profitability has also macroeconomic roots. Going back to Solow (1956), long run economic growth is only possible with technological progress (Solow 1956; see Mankiw 2003 for a detailed description of the Solow model). The relating endogenous growth models (e.g. by Romer 1990) connect this macroeconomic theory with the innovation activity of firms (see for a short description: Mankiw 2003 and for more detailed explanation on these models: Verspagen 2005:501).

One of the first researchers considering innovation in their explanation of how CSR affects financial performance are McWilliams and Siegel (2000). They emphasize that models analysing the effects of CSR on financial performance without an innovation variable are not properly designed. Hull and Rothenberg (2008) extend the research of McWilliams and Siegel (2000) and focus on the effects of CSR on financial performance when firms differentiate either via innovation or via CSR. Lioui and Sharma (2012) also highlight the necessity of including innovation in empirical models on CSR and financial performance. These empirical studies underline the importance of innovation when examining effects of CSR on profitability. The studies mentioned above consider innovation in form of R&D expenditure or R&D intensity (R&D expenditures per sales), which is only one way to measure innovation.

The measurement of innovation depends on what is defined as innovation (Smith 2005). There are different *types of innovation*, and empirical research distinguishes between input and output variables used for measuring innovation. In the Oslo Manual *innovation input* is explained as investments, which includes R&D (see also Kleinknecht, Montfort, and Brouwer 2002) and other innovation related investments. Furthermore, other kinds of preparation for different types of innovation like relationship to universities to deploy external knowledge can be treated as innovation input (OECD and Eurostat 2005). In empirical literature R&D expenditures are often taken as the only input innovation variable, because of its long recording history and the comparability between countries in contrast to other input innovation determinants (Kleinknecht et al. 2002; Smith 2005).

The *innovation output* is often measured as patent stock (e.g. Czarnitzki and Kraft 2010). However, patents are only related to technological innovations, which is often related to the manufacturing sector but leaves out the service sector, and in fact not all of these technological innovations are patentable (Kleinknecht et al. 2002; Smith 2005). This means that some innovation activities cannot be considered when using patent data as innovation output indicator.

Nevertheless, patents are widely used in empirical research because of the long recording history and the availability of data.

New innovation data aiming to overcome the weaknesses of innovation measured as R&D (input) and patent (output) as discussed e.g. by Kleinknecht et al. (2002) or Smith (2005) can potentially be found in survey data, but in reality proper innovation surveys are hard to find. One exception is the European Community Innovation Survey (CIS), which directly asks for product, process, organizational and marketing innovations as well as other input additionally to R&D expenditures. Apart from the CIS only scarce data on these alternative innovation indicators is available and therefore research is mainly based on the two traditional input and output innovation indicators. A brief literature review in the additional WP2.2 report will give an overview on the different studies on CSR and innovation and which type of innovation was used for the empirical examination. We will show, mainly R&D was used to measure innovation.

In the extra WP2.2 report we provide econometric analyses based on different databases to overcome problems with one specific measurement of CSR or innovation after a brief literature review. As mentioned before, the CIS database is one exception of surveys providing more detailed data on innovation. We use the Mannheim Innovation Panel, which is the German contribution to CIS, as one of our databases to analyse the connection of CSR, innovation and financial performance. This database provides representative data on innovation of German companies. As this database focuses on innovation, the additional CSR data is limited. Therefore we use the database ASSET4 (A4), which is an unbalanced panel on different CSR indicators, in another analysis. A4 offers the opportunity to get a more detailed look into different CSR indicators related to the IMPACT Project in a descriptive analysis. Furthermore, an econometric analysis using R&D, provided in the A4 database, as well as additional matched patent data as innovation indicators and a CSR indicator developed from the different indicators of A4 give further insights into the connection between CSR, innovation and financial performance. We will analyse these two databases (MIP and A4) with regard to the research questions of the IMPACT Project by including innovation as one determinant of financial performance, which can influence the effect of CSR on financial performance. Detailed information on the databases and the results are provided in WP2.2 as an extra report.

2.5 CSR impact

The yellow area is the locus of the model of CSR (meta) impact (research question 4). In this model we analyse the relationship between CSR indices (based on the CSR ratings of large companies and SMEs) and the attainment of EU goals at the sector and/or regional level. Table 2.3 specifies the type of factors included in the model of CSR meta impact in more detail and how they relate to the concepts in (the yellow area of) Figure 1.

Table 2.3 The impact of CSR

Variable in IMPACT framework	Corresponding factors in model of drivers
CSR performance (comprises CSR commitment, CSR output, CSR implementation and CSR outcome)	ESG rating of Sustainalytics (large companies) / CSR rating based on survey outcomes (SMEs)
Meta CSR impact	Economic growth (per sector and region)
	Social impacts (per sector and region): employee

	training and job safety and health
	Ecological impacts (per sector and region): GHG emissions and energy consumption

The major research objective of this model is to investigate the impacts of corporate social responsibility on macro sustainability. We focus on two social and two environmental dimensions of macro sustainability: Safety and Health, employee training, GHG emissions and energy consumption. The research question is: “Do higher levels of CSR at the micro level promote a higher level of safety and health and employee training and a lower level of GHG emissions and energy consumption at the macro level?”.

CSR may have direct effect on levels of sustainability or changes in sustainability (through innovation) as well as indirect effects through social capital, (re)allocation or regulation effects. In order to assess the impact of CSR performance at the business level on the sustainability goals of the EU, we will therefore perform an econometric analysis linking CSR to sustainability at the macro level more directly (see Figure 1). For this purpose, we first develop a data base of aggregate CSR indices for two social and two environmental CSR for various sectors and countries by weighting the individual companies. This will provide us with aggregate CSR indices for each CSR dimension. Next, we will research the relationship between these aggregates and macro sustainability data of EU per sector and country in the economic, social and environmental dimensions.

3 SURVEYS AMONG LARGE COMPANIES AND SME'S[2]

To disentangle the complex relationships between drivers of CSR, CSR motivations, CSR performance and impact, we need an extensive databank. In the RARE project, the analysis of the relationship between CSR commitment, strategy, implementation and performance was based on only 49 companies. Although the project generated very interesting and relevant qualitative indications, a dataset of 49 companies is too small to derive any representative conclusions for CSR in Europe. The most important target that we set ourselves in this research is therefore to extend the database of CSR in order to facilitate more representative research into CSR.

Whereas major rating agencies like Sustainalytics, ASSET4 and KLD have developed extensive CSR data for large companies, no such systematic databank exists yet for SMEs. Although several researches have been done to CSR of SMEs (Spence, Habisch and Schmidpeter, 2004; European Commission, 2002), all these researches are based on samples that are too small for a European wide econometric analysis of CSR by SMEs that analyses the research questions in the IMPACT project. For that reason we set up a very ambitious new data project that aims at gathering data of CSR by SMEs in twelve European countries. For this purpose, we developed a large survey that will be described in section 1 of this chapter. A subset of the questions in the SME survey concerning drivers of CSR was also used for a survey among large companies as ratings of large companies do not include information on the drivers of CSR. Combining this information with the CSR ratings for large companies (discussed in chapter 4) allows an analysis of the drivers of CSR by large companies. In section 2 we present the outcomes of the surveys for the drivers of CSR for SMEs and large companies. Section 3 describes the outcomes for CSR performance by SMEs. Section 4 describes the outcomes for innovation.

3.1 Measures, procedures and response

The SME survey contains 130 questions and the survey among large companies 39 questions.[3] Table 3.1 presents an overview of the measures surveyed for the drivers of CSR among SMEs and large companies (for further explanation, see section 3.2). Table 3.2 presents an overview of the measures surveyed for the CSR performance among SMEs (for further explanation, see section 3.3). In addition, the SMEs were asked some background questions about the position of the persons who filled in the survey in the firm, the importance of various stakeholder relations, the company engagement in CSR and in which year it consciously started with CSR, whether the improvements in social and environmental outcomes resulted from voluntary initiatives by the company, the company's economic performance and innovation.

Table 3.1 Measures of drivers of CSR

Variable	Measurements
CSR motivation	
Strategic motivation	CSR effect on long term financial results, reputation and innovative capacity and financial, reputational and innovation motive
Legal motivation	CSR effect on meeting government regulation and regulation motive
Intrinsic motivation	Company is engaged in CSR because it feels responsible for the planet and the society; Company is engaged in CSR because CSR creates personal satisfaction for the people in company

Internal business environment	
Business culture	Open systems business culture that combines external focus with flexible and participative management style
Time horizon	Time horizons for financial targets and CSR investments
Size	Number of FTEs
Slack resources	Average ratios between net income and equity, total assets and capital
Age division employees	Shares of employees aged 25 years or younger and aged 25-50 years
Skill level	Shares of medium and high skilled employees
Internal and external stakeholders	
Response of employees	Effect CSR on labour turnover and motivation of employees
Capital market response	Effect CSR on costs of capital and access to capital
Product market response	Effect CSR on product margins and turnover
Labour market response	Effect CSR on inflow of highly qualified employees
External environment	
Price competitiveness	The intensity of price competition
Technological competitiveness	The intensity of competition on quality and/or product innovation
Type of market	Monopoly, oligopoly, monopolistic competition, perfect competition
Market position	Market leader, market follower, level playing field, niche player
Position in the chain	Company's position in the supply chain (B2B versus B2C)
Industrial associations	Information on CSR provided by industrial associations
Business schools	Information on CSR provided by business schools
Government regulation	CSR reporting is subject to mandatory rules
NGOs & media	NGOs or media monitor company's CSR
Degree of Internationalisation	% of turnover outsourced to developing countries
Sector	Type of sector in which company operates

The survey for the large companies was performed in English language. The survey for the SMEs was translated into the national languages of the countries in which the companies that were invited to the survey were located (Danish, Dutch, Finnish, French, Italian, Hungarian, German (this version was used both in Germany and Austria), Polish, Spanish, and Swedish). An advanced Language Management Utility was used to coordinate survey development in different languages. CentERdata developed a sample management system which makes monitoring of the fieldwork and handling of the data flow in a structured way possible.[4]

Table 3.2 Measures of CSR performance of SMEs

Commitment	
Internal publication of a code of conduct	Director/manager is answerable to CSR issues
External publication of a code of conduct	Membership of global initiatives
Output	
Active dialogue with NGOs concerning CSR issues	Training program in CSR for employees
Cooperation with companies in supply chain	Use of a reference guide or CSR tool to measure and verify CSR performance
Partnerships with professional training institutes	ISO 9001/9002/9003
Participation in local initiatives	ISO 14001, EMAS or Greenhouse Gas Protocol

Remuneration management is linked to CSR performance	SA 8000
A confidential person or an ethical commission	Other certifications
Implementation: Effort / Measuring /Targeting / Reporting	
Women in board and/or executive positions	CO2 emissions
Inflow of disadvantaged people (like ethnic minorities, handicapped, long term unemployed) in employment	Energy consumption and/or increase use of renewable energy
Work/life balance	Water consumption
Work place accidents and/or sickness absence rate	Waste and/or increase recycling of waste
Employee training	Environmental conditions of suppliers
Labour conditions of suppliers and respect of human rights	
Outcomes (level and change)	
% of women in board and/or executive positions	CO2 emissions
Inflow of disadvantaged people (like ethnic minorities, handicapped, long term unemployed) as % of total inflow	Energy consumption
Number of overtime hours as a % of total FTEs	Renewable energy
Collective bargaining coverage	Water consumption
Sickness absence rate	Waste
Share of permanent contracts	Recycling of waste

The e-mail addresses of companies were obtained from KOMPASS (http://www.kompass.com). Before setting out the survey, we first pre-tested the survey by interviewing executives from companies in various sectors. The SME survey was pre-tested for a sample of 10 companies, whereas the survey for the large companies was pre-tested for a sample of 8 companies. The aim of the interviews was to explore measures and terms to be used to measure the various factors in order to secure content validity. If the interviewees did not understand the questions or measures, we had the opportunity to seek, in interaction with the interviewees, for other formulations for the same concept. In this way, we reduced item ambiguity by avoided vague questions that could lead to misinterpretation by the respondents.

Table 3.3 Respondents of large companies according to region (%)

Asia	Japan (67%), Singapore (21%), Hong Kong (11%)	9
Anglo Saxon non EU	US (45%), Canada (36%), Australia (19%)	20
Anglo Saxon EU	UK (78%), Ireland (22%)	9
Mediterranean Europe	Greece (16%), Italy (19%), Spain (52%), Portugal (13%)	15
Scandinavia	Norway (9%), Sweden (54%), Denmark (25%), Finland (13%)	11
Continental Western Europe	Germany (30%), Austria (14%), Switzerland (8%), France (18%), Belgium (4%), The Netherlands (24%), Luxembourg (1%)	35

In order to reduce the potential for social desirability bias in the responses to the questions in the survey (i.e. the tendency of respondents to answer questions in a manner that will be viewed favorably by others), we explained to the respondents in a cover letter that the survey was

confidential and to be used for research purposes only. The identity of the participants would remain anonymous. The executives who filled in the survey thus had little reason to present a more favorable picture than they knew was the case.[5]

The survey for large companies was set out in November 2010 among 1.346 companies that are rated by Sustainalytics. After three reminders, in total 324 companies responded, of which 212 completed the survey (15.8 %). A majority of the respondents concern companies with headquarters located in European countries.

In September, October and November 2011 CentERdata fielded the SME survey. The survey was presented to 365,002 enterprises (2.3% of all SMEs in these countries), and after three reminders 5,317 respondents fully completed the survey (response percentage 1.5%). Table 3.4 presents an overview of the response per country for the SME survey.

Table 3.4 Response to SME survey

Region	Total number of SMEs[a]	Number of E-mails	% of all SMEs	Number of responses completed	Response rate (%)
Anglo Saxon EU (UK)	1551,381	31,801	2.0	163	0.5
Mediterranean Europe	6681,294	124,790	1.9	2,100	1.7
Italy	3937,495	85,920	2.2	1,534	1.8
Spain	2743,799	38,870	1.4	566	1.5
Scandinavia	947,593	28,241	3.0	861	3.0
Denmark	208,897	8,431	4.0	358	4.2
Finland	202,578	6,039	3.0	240	4.0
Sweden	536,118	13,771		263	1.9
Continental Western Europe	4833,225	137,322	2.8	1,655	1.2
Austria	285,672	11,254	3.9	148	1.3
France	2345,988	63,054	2.7	346	0.5
Germany	1682,049	50,129	3.0	537	1.1
Netherlands	519,516	12,885	2.5	624	4.8
East Europe	2077,983	42,848	2.1	548	1.3
Hungary	561,670	12,155	2.2	223	1.8
Poland	1516,313	30,693	2.0	315	1.0
Total	16091,476	365,002	2.3	5,317	1.5

[a] Source: EIM (2007)

Table 3.4 shows many responses from Italy. This is due to the large number of Italian SMEs. The response rate was highest for the Scandinavian countries (Denmark and Finland) and for the Netherlands. In contrast, for the UK and France we received a relatively low number of responses. The average response rate was 1.5%. This relatively low response rate is in line with

ex-ante expectations, because the survey is electronic and relatively long and takes substantial effort from SMEs.

Because of the relatively low response rate and possible non-response bias, we cannot assume that the outcomes are representative for all SMEs in the twelve European countries. In order to evaluate the non-response bias, we used wave analysis which assumes that late respondents are more similar to non-respondents than early respondents (Lin & Ho, 2011). For this purpose, we constructed a dummy variable with value 1 for respondents that responded to the first round, value 2 for responses after the first reminder, value 3 for responses after the second reminder and value 4 for responses after the third reminder. Bivariate regression analysis showed that the (Spearman) correlation coefficient between this dummy and the CSR performance of companies (see Chapter 5 for the exact definition) is insignificant (-0.012 with p=0.39). Based on this methodology, we therefore find no indication of a significant non-response bias.

The survey also asked for the function of the person who filled in the survey. For the SMEs, the respondents have a position as director owner (37%), director (21%) or manager (20%). For large companies, no board member filled in the survey, 62% is working on a CSR department and 38% on an investor relations or corporate communication department.

3.2 Survey results for drivers for large companies

In this section we present the results for the questions about drivers of CSR of the survey among large companies.

3.2.1 Perceptions and motivations

Table 3.5 presents the outcomes for CSR perceptions and motives for large companies.

Table 3.5 Perceptions and motives of large companies

Perceptions: CSR influences the following aspects of your company[a]	
CSR improves profitability in the long term	3.4
CSR improve reputation	4.0
CSR improves innovative capacity	3.2
CSR helps to meet (future) government regulation	3.2
Motivations: Your company engages in CSR activities because[b]	
it serves long-term financial interests	3.1
it limits reputational risks	2.7
it leads to innovation	2.2
it helps to meet government regulation	2.0
your company feels responsible for the planet and the society	2.7
it creates personal satisfaction for the people in your company	2.4

[a] Mean response to 5 options: 'not at all'(1), 'negligible'(2), 'small but significant'(3), 'substantial'(4) 'very much'(5).
[b] Mean response to allocation of 15 points among six options

Companies perceive that their CSR has a substantial influence on their reputation, whereas the effects on innovation and meeting regulation are small but significant. The most important motive is the profit motive, but also the reputation motive features high. Both are strategic motives. The

legal motivation receives least support, whereas the intrinsic motives receive an intermediate priority. This indicates that large companies are more motivated by strategic than by intrinsic motives. This is in line with other empirical research. For example, Lougee and Wallace (2008) researched two samples of large companies, the S&P 500 and Domini 400, and used KLD data of quantitative measures of CSR for a period of 15 years. Their results indicate that most companies are extrinsically motivated and use CSR mainly as a form of "risk management". Other researchers have found more mixed results. Brønn and Vidaver-Cohen (2009) research 1644 Norwegian companies. Their sample only includes firms with over 50 employees. They asked managers what they see as the primary reasons for their company's engagement in activities that benefit society from a list of sixteen motives. They find that the company's long-term interest and image feature among the most frequently three reasons. However, intrinsic motives are also often ranked high, such as be recognized for moral leadership (second rank) and personal satisfaction (fourth rank).

3.2.2 Internal business environment

Business culture has been defined in many different ways (Linnenluecke and Griffiths, 2010). Schein (2004) distinguishes three dimensions of organizational culture: the observable culture (the visible organizational structure, processes and behaviour), underlying assumptions (unconscious beliefs and perceptions which form the ultimate source of values and action) and espoused values (strategies, goals and philosophies). The business culture hence also comprises the strategy of the company.

To operationalize business culture, scholars often use the competing values framework (CVF). This framework distinguishes two dimensions of the organizational culture: management style and external orientation. The first dimension, management style, distinguishes control versus flexibility. Companies that manage by control use formal mechanisms, such as rules, directives and direct supervision to direct the organisation towards the organizational goals. Companies that have a flexible management style rely on participation, intrinsic commitment and autonomy to realise the company goals. The second dimension, external orientation, ranges from an internal focus on efficient organizational processes to an external focus on market dynamics. Combination of the two dimension yields four types of business cultures: Organizations with a control dominated and internally focused culture (the so-called internal process model); flexible but internally focused companies (the so-called human relations model); companies that are externally oriented but manage their companies in a hierarchal way (the so-called rational goal model); externally oriented and flexible organised companies (the so-called open systems culture).

The responses show that large companies relatively often use formal coordination (or have an intermediate position). When large companies use social coordination, the open systems model is much more popular than the human relations model.

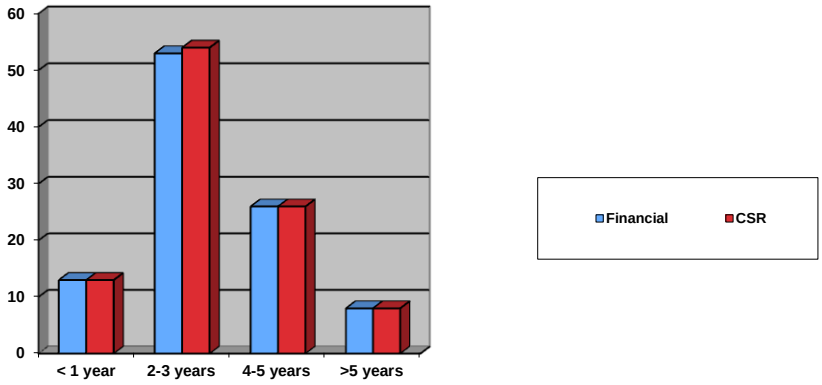
Table 3.6 Type of business culture (in %)[a]

	Internal focus 15%	**External focus** 40%
Formal coordination 33%	**Internal process model** 9%	**Rational goal model** 8%
Social coordination 27%	**Human relations model** 3%	**Open systems model** 17%

[a] The sum of shares does not add to 100 %, because a number of companies report an intermediate position

Time horizon is measured for financial targets and for investments in CSR. The largest part of companies applies a time horizon of 2-3 years. A time horizon of 4-5 years is most common among large companies. Note, furthermore, that the time horizon for CSR is very much related to the time horizon used for financial targets. The bivariate correlation coefficient is 0.38 and significant at $p<0.01$.

Figure 3.1 Time horizon (in %)



The size of the companies is, as expected, very different. The modal size of the large companies is in between 10000-50000 employees. As an indicator for slack resources Table 3.7 reports the return on assets.

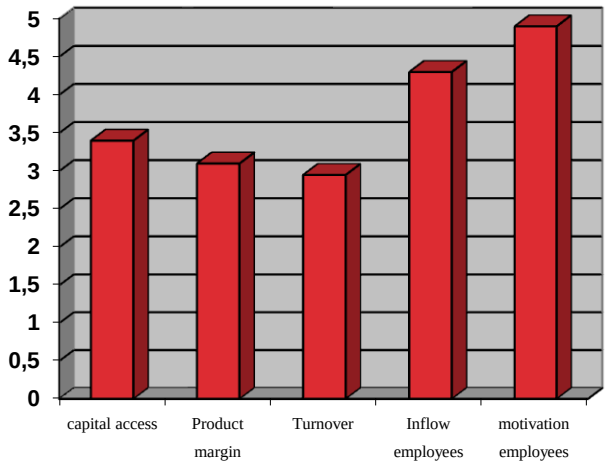
Table 3.7 Size (employees) and slack resources (%)

Employees	**<10**	**10-50**	**50-100**	**100-250**	**250-1000**	**1000-10000**	**10000-50000**	**>50000**
	6			6		31	37	20
Return on assets	**<0**	**0-1**	**1-3**	**3-5**	**5-7**	**7-10**	**>10**	
	2	18	19	20	19	13	10	

3.2.3 Internal and external stakeholders

Figure 3.2 shows the outcomes of CSR responsiveness of various stakeholder groups.[6]

Figure 3.2 Stakeholder response to CSR[a]



If we compare the relative scores, large companies perceive that the labor market, and particular their own employees, is most sensitive to the CSR of the company. For other stakeholder groups, large companies state that financers (which concern relatively more shareholders) are more responsive than customers.

Table 3.8 provides insight into the relative importance of various stakeholders. We find that customers receiving highest priority, employees second priority, whereas community and society are considered least important.

Table 3.8 Importance of stakeholder relations

	Shareholder / owners	banks	employees	customers	suppliers	government	community	society
Large[a]	2.6		2.6	3.0			1.8	

[a] Mean response to allocation of 10 points among four options

3.2.4 External environment

Figure 3.3 depicts the type of output market and the market position. As expected, large companies characterize their market relatively more as oligopolistic. Furthermore, most large companies are characterized as market leader.

Figure 3.3 Type of market and market position (in %)

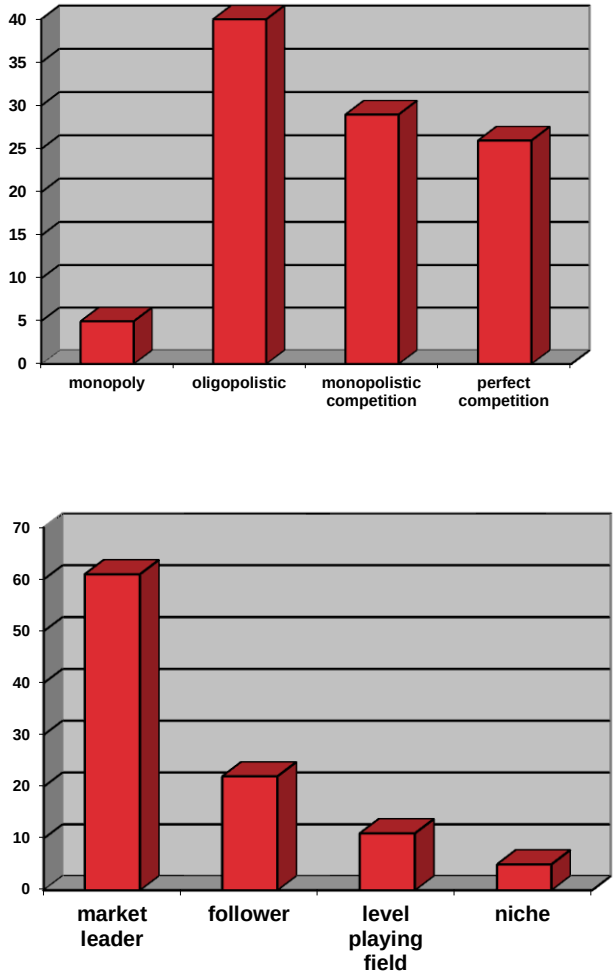


Table 3.9 reports the degree of competition on the output market. We can conclude that for large companies the degree of price and technological competition is almost the same. This is remarkable, since from Figure 3.3 one would have expected that large companies are relatively more subject to technological competition. This indicates that also market leaders operating in oligopolistic markets face substantial price competition.

Table 3.9 Degree of competition [a]

Price competition	3.5	Technological competition	3.4

[a] Mean response to 5 options: 5 options, 'virtually none' (1), 'moderate' (2), 'considerable' (3), 'intense' (4), 'very intense' (5).

Figure 3.4 shows that few companies only supply to consumers.

Figure 3.4 Position in the chain (in %)

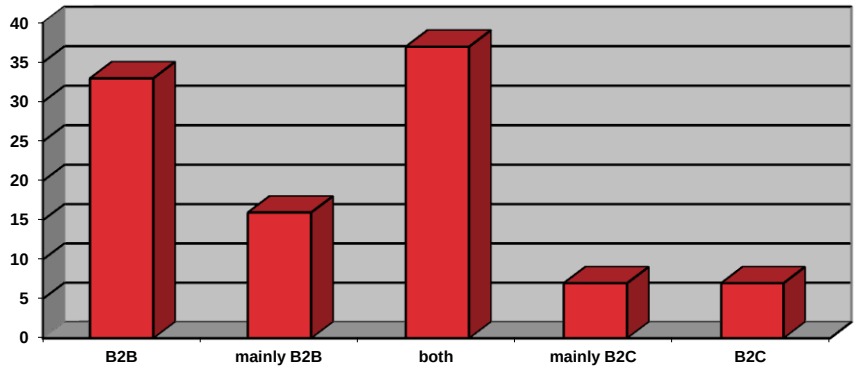


Table 3.10 shows that large companies receive between significant an substantial information on CSR from industrial organisations. Business schools seem to play only a minor role. Large companies are to a small but significant extent subject to mandatory rules, whereas monitoring by NGOs or media is in between significant and substantial.

Table 3.10 Information[a]

CSR info by industrial associations	3.2	Monitoring by NGOs & media	3.4
CSR info by business schools	2.6	Mandatory reporting	2.9

[a] Mean response to 5 options: 'not at all'(1), 'negligible'(2), 'small but significant'(3), 'substantial'(4) 'very much'(5)

In the survey among large companies, we measured the share of turnover outsourced to developing countries. 48% filled in that the company did not outsource turnover to developing countries and another 33% did so for less than 25% of turnover. This indicates that CSR issues related to working or environmental conditions in developing countries may be not very important for this sample of companies.

Table 3.11 reports the sector division. For the survey of large companies the sector categorization is based on the Global Industry Classification Standard (GICS).[7] 51% of the companies operate in manufacturing sectors and 49% in the service industries. In comparison to the sector allocation for SMEs as we will discuss in the next section, particularly the financial sector is more represented in the survey among large companies.

Table 3.11 Sector division (in %)

Manufacture of food products, beverages and tobacco	7.7	Other manufacturing	8.0
Manufacture of textile and leather products	1.5	Electricity, gas and water supply	5.4
Manufacture of paper, publishing and printing	1.5	Trade and hotels and restaurants	3.0
Oil and chemical industry	9.3	Transport	3.5

Metal industry	4.9	Telecommunications and computer services	6.4
Machine industry	5.4	Finance	26.8
Manufacture of transport equipment	3.9	Real estate activities	2.4
Construction	3.4	Other services	7.8

3.3 Survey results for drivers for SMEs

In this section we present the results for the questions about drivers of CSR of the survey among SMEs. As this survey have many questions in common with the survey for large companies, we sometimes compare the results of both types of companies.

3.3.1 Perceptions and motivations

Table 3.12 reports the results for the perceptions and responses of SMEs.

Table 3.12 Perceptions and motives of CSR of SMEs[a]

Perceptions		
SR improves profitability in the long term	4.1	
SR limits reputational risks	4.5	
SR improves innovative capacity	4.3	
SR helps meeting (future) government regulation	4.1	
Motivations	positive[b]	negative[c]
It serves/reduces long-term financial interests of shareholders and/or director owner	3.8	2.6
It helps to meet (future) government regulation / going beyond regulation is not important	4.1	3.1
It leads to/hampers innovation	4.7	2.6
It reduces/increases operational costs	4.3	3.6
It limits/increases reputational risks	4.6	2.5
Your enterprise feels/does not feel responsible for the planet and the society	5.2	3.0
It creates/does not create personal satisfaction for the people in your enterprise	5.1	3.3
Large customers ask/do not ask for it	3.9	3.3
It fulfils/does not fulfill expectations of society	4.7	3.2

[a] Mean response to 7 point scale ranging from: 'not at all'(1) to 'very much'(7).
[b] Positively formulated motives of companies that are engaged in CSR (n=5050)
[c] Negatively formulated motives of companies that say they are not engaged in CSR (n=374)

Just as for large companies, SMEs expect CSR to have the largest effect on reputation. Because of their intimate relationship with the community in which they operate, SMEs have a stronger need to pursue a community friendly policy. They often interact with stakeholders in network

relations, where stakeholders communicate their expectations informally. As a result, SMEs are more sensitive to signals from local customers and suppliers. The reputation of a company at its locations, as employer, producer or actor, strongly influences its competitiveness (EC, 2002; Jamali et al., 2008). If a company fails to adopt forms of CSR that meet the expectations of the local community, it directly runs the risk of a potential economic loss (Kusyk and Lozano, 2007). The long term effect on profitability is, however, seen to be less important than the reputation effect. This indicates that, notwithstanding the favourable effect on reputation, it is a challenge to get CSR efforts rewarded by the market (Spence et al., 2000).

In the SME survey the formulation of CSR motivation depends on the response on another question, namely whether companies engage in CSR. For example, for companies that engage in CSR, one motive is that CSR limits reputational risks. For companies that do not engage in CSR the corresponding negative formulation is that CSR increases reputational risks. A large majority of 93% confirm that they engage in CSR. For these companies, the two intrinsic motivations are the most important motives. Next come reputation and innovation. Hence, there is an important difference in motivation of CSR between SMEs and large companies: whereas strategic motivation is more important for large companies, intrinsic motivation is more important for SMEs. This can be explained by the fact that SMEs are often privately owned and managed by their owners (Spence, 1999; Jenkins, 2009). In general, family businesses differ in various respects from non-family owned firms. In particular, family businesses have been characterized by long-term commitment, superior employee care and loyalty, long tenure of leadership (Flören, 1998) and exhibiting a strong religious/philanthropic approach to CSR (Jamali et al, 2008; Laudal, 2011). The policies of family business tend to reflect the values of the managers (Lepoutre and Heene, 2006; Murillo and Lozano, 2006). Thus, the personal preference of top management/owners is the most influential factor affecting the type and extent of SMEs' CSR policy (EC, 2002). One would therefore expect that family companies will sometimes be more directly and intrinsically concerned about ethical issues, because of a closer relationship between the business and the personal life of the managers. For both large companies and SMEs we find legal motivation of CSR is not very important. Furthermore, pressure from customers also does not figure high for SMEs. For the small minority of companies that say they do not engage in CSR, the most important barrier is the cost involved with CSR, but also lack of intrinsic motivations scores relatively high.

3.3.2 Internal business environment

Business culture is operationalized in the same way as for large companies, namely by using the competing values framework (CVF). The responses show that an external focus is more prevalent among SMEs than among large companies. Particular the open systems model is popular among SMEs. In contrast, we saw that large companies relatively more use formal coordination (or have an intermediate position).

Table 3.13 Type of business culture (in %)[a]

	Internal focus 13%	**External focus** 67%
Formal coordination 19%	**Internal process model** 4%	**rational goal model** 12%
Social coordination 48%	**Human relations model** 5%	**Open systems model** 36%

[a] The sum of shares does not add to 100 %, because a number of companies report an intermediate position

Time horizon is measured for financial targets and for investments in CSR. As for large companies, the largest part of the SMEs applies a time horizon of 2-3 years. But on average, SMEs seem to have a shorter time horizon than large companies. Whereas one out of four SMEs have a time horizon of 1 year or less, a time horizon of 4-5 years is more common among large companies. Note, furthermore, that the time horizon for CSR is very much related to the time horizon used for financial targets. The bivariate correlation is 0.47 and significant at $p<0.01$.

Figure 3.14 Time horizon (in %)

	1 year	2 years	3 years	4-5 years	>5 years
Financial	26	23	25	15	11
CSR	22	24	27	17	10

As for large companies, the size of the SMEs in our survey is very different. If we take the number of employees as an indicator, most SMEs are small companies with 10-50 employees (in FTEs).

Table 3.15 Size (employees) and slack resources (in %)

Employees	**<10**	**10-50**	**50-100**	**100-250**	**250-1000**	**1000-10000**	**10000-50000**	**>50000**
	23	38	16	13	6	3	1	0
Return on assets	**<0**	**0-1**	**1-3**	**3-5**	**5-7**	**7-10**	**>10**	
	9	12	11	9	4	6	49	

As an indicator for slack resources Table 3.14 reports the return on assets. The data for SMEs are very outbalanced. In the survey we asked for net income, turnover, equity and total assets and calculated the return as a ratio. Half of the companies reported a return on assets larger than 10%. When we analyze the distribution, we have indications that companies did not accurately fill in their data, because 20% reports a return on assets larger than 100%. If we calculate the return on turnover, we obtain similar outcomes. From this we conclude that the financial data of SMEs are not reliable and cannot be used for analysis.

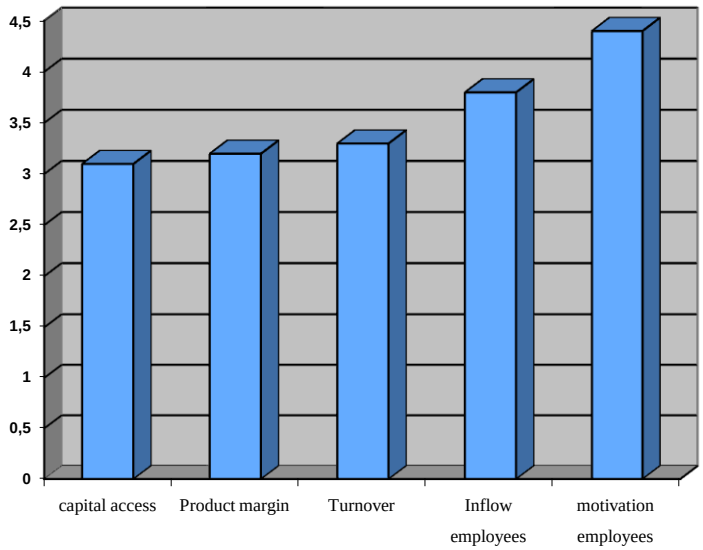
For the SMEs we investigated the skill and age distribution of employees. The shares of low, medium and high skilled equal on average 33%, 42% and 25% respectively. For the age

distribution, we found that on average 11% of employees are younger than 25% old, whereas 22% is older than 50.

3.3.3 Internal and external stakeholders

Figure 3.5 shows the outcomes of CSR responsiveness of various stakeholder groups.[8]

Figure 3.5 Stakeholder response to CSR[a]



Like large companies, SMEs perceive that the labor market, and particular their own employees, is most sensitive to the CSR of the company. For other stakeholder groups, SMEs consider that customers on the product market respond more to their CSR than financers on the capital market (particularly banks). Also in our pilot interviews with managers of SMEs most of them stated that financers (like banks) do not at all consider the CSR of their company in their decision to provide credit to their company.

Table 3.16 provides insight into the relative importance of various stakeholders. Jamali et al. (2008) hypothesize that SMEs have a different stakeholder orientation than large companies, with a greater focus on internal aspects like work-family issues, equity, health, well-being and worker participation. They forge strong caring relationships with employees and are important players within their local community. However, when testing for the importance of different stakeholder relations, they find that SMEs and large companies rate their stakeholders in a similar way, with primary importance accorded to customers, employees and shareholders, followed by suppliers, community and/or the environment. This is confirmed by our results. Although the exact scales used in the two surveys differ, we find that the order of importance is quite similar, customers receiving highest priority, employees second priority, whereas community and society are considered least important.

Table 3.16 Importance of stakeholder relations[a]

	Shareholders / owners	banks	employees	customers	suppliers	government	community	society
SMEs	5.2	5.1	6.0	6.2	5.7	4.2	4.3	3.7

[a] Mean response to 7 point scale ranging from: 'not at all'(1) to 'very much'(7).

3.3.4 External environment

Figure 3.6 depicts the type of output market and the market position. As expected, SMEs operate more on perfect markets where many enterprises are selling products and/or services that have very similar characteristics. Most SMEs are mostly operating on a level playing field.

Figure 3.6 Type of market and market position (in %)

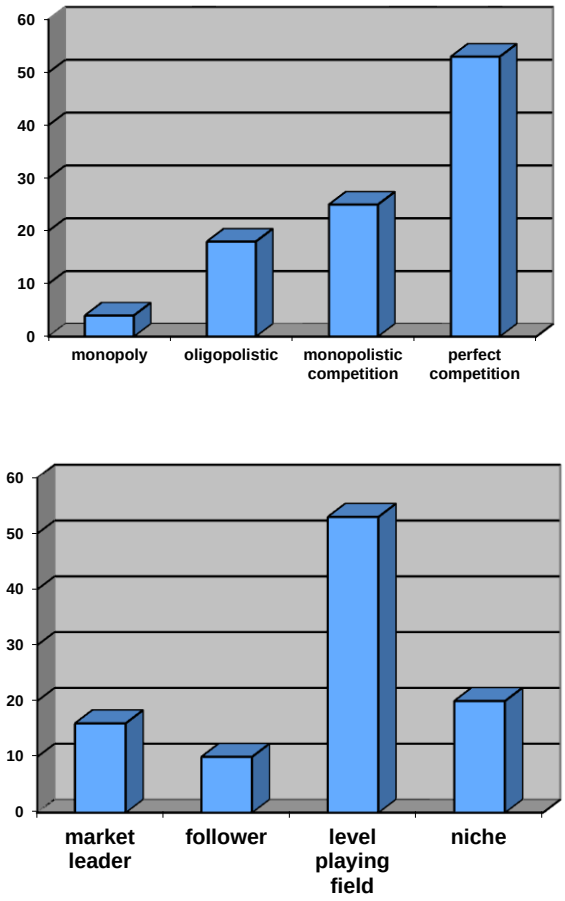


Table 3.17 reports the degree of competition on the output market. Like large companies, the degree of price and technological competition for SMEs is almost the same. This is remarkable, since from Figure 3.6 one would have expected that SMEs are more subject to price competition.

This indicates that also market leaders operating in oligopolistic markets face substantial price competition.

Table 3.17 Degree of competition [a]

Price competition	5.1	Technological competition	5.2

[a] Mean response to 7 point scale ranging from: 'not at all'(1) to 'very much'(7).

Figure 3.7 shows that few companies only supply to consumers. For SMEs, this is partly due to the fact that KOMPASS mainly supplies e-mail addresses of companies that operate in B2B relations.

Figure 3.7 Position in the chain (in %)

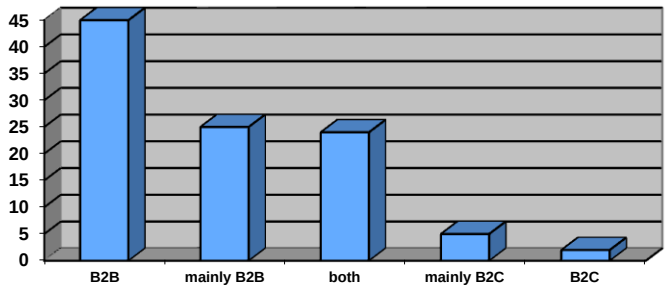


Table 3.18 shows that SMEs are not very much monitored by NGOs and media. As it is practically impossible for NGOs and media to monitor each small company, SMEs will attract less public attention. For this reason, Lynch-Wood and Williamson (2007) argue that the social license motive will not be sufficient to induce SMEs to go beyond compliance to the law. They are just too small to be visible. Business schools and mandatory reporting were supposed to play no major role for SMEs, as opposed to large companies, and therefore were not asked about in the survey.

Table 3.18 Information [a]

CSR info by industrial associations	3.0	Monitoring by NGOs & media	2.3

[a] Mean response to 7 point scale ranging from: 'not at all'(1) to 'very much'(7).

Table 3.19 reports the sector division. In the SME survey, we distinguish 19 sectors based on the National Accounts classification. Most companies operate in manufacturing sectors, but a substantial part of 37% concerns service industries.

Table 3.19 Sector division (in %)

Agriculture, forestry and fishing	2.2	Electricity, gas and water supply	1.1
Mining and quarrying	0.6	Construction	7.2
Manufacture of food products, beverages and tobacco	4.2	Trade and hotels and restaurants	8.7
Manufacture of textile and leather products	3.0	Transport	3.9

Manufacture of paper, publishing and printing	2.2	Telecommunications and computer services	4.4
Oil and chemical industry	2.9	Finance	1.1
Metal industry	8.9	Real estate activities	0.8
Machine industry	9.0	Other services	18.0
Manufacture of transport equipment	0.7	Other business activities	12.3
Other manufacturing	8.8		

In comparison to the sector allocation for large companies, where we used another sector division, particularly the financial sector is more represented in the survey among large companies.

3.3.5 Commitment

Table 3.20 presents the outcomes for CSR commitment, which is part of the CSR Response in the IMPACT framework. The policies of the family business tend to reflect the values of the managers (Lepoutre and Heene, 2006; Murillo and Lozano, 2006). The personal preference of top management/owners is therefore the most influential factor affecting the type and extent of SMEs' CSR policy (EC, 2002). A company expresses a strong commitment to CSR if the director is answerable to CSR issues (Graafland et al., 2003). Furthermore, companies may implement codes of conduct as an internal management tool to communicate their values and ethical standards to employees. A code of conduct is a formal statement of principles that defines the basic responsibilities of the company towards its shareholders and other stakeholders (Kaptein & Wempe 1998; SER 2001; Graafland *et al*. 2003). It may also publish an external code of conduct if it wants to communicate its values to outside stakeholders. Another instrument to communicate a company's commitment to CSR is membership of global initiatives, like Global Compact, which was launched in 1999 by UN Secretary General Kofi Annan. In order to participate in the Global Compact, companies must commit to integrate its ten principles into their mission statement and activities, inform their employees, shareholders, customers and suppliers about them and report progress on implementation of the principles in annual reports. This could be either in the form of a company-wide adoption of or conformance with principles, values or practices.

Table 3.20 CSR Commitment (%)

	UK	Mediterranean	Scandinavia	Continental	East	Total
Director/manager is answerable	81	57	76	82	36	66
Internal code of conduct	72	49	48	49	38	49
External code of conduct	41	19	30	23	17	22
Membership global initiatives	15	9	12	12	9	11

Table 3.20 shows that for SMEs commitment is mostly reflected by the personal accountability of the director towards CSR. Particular in UK, Scandinavia and Continental Europe the director is answerable to CSR issues. An exception is East Europe. Furthermore, an internal code of code is quite common for SMEs (particular in UK) but externally published codes of conducts are not

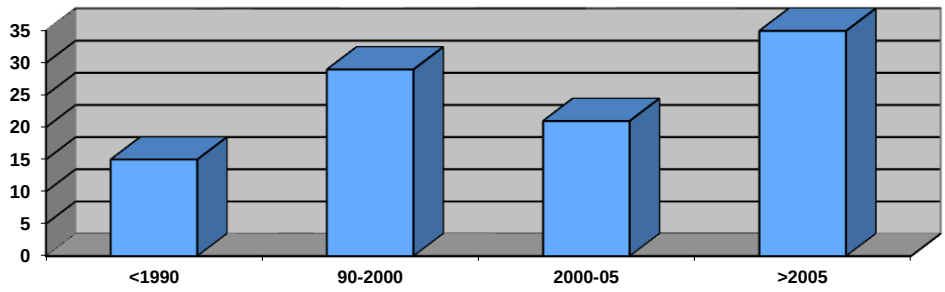
(particularly in East European countries). Finally, as could be expected, membership of global CSR initiatives is relatively rare among SMEs.

3.4 Outcomes for CSR performance

In this section we only present outcomes for the SME survey. Data of CSR performance of large companies are based on the ratings of Sustainalytics. The Sustainalytics ratings will be discussed in more detail in chapter 4.

As noted above, we enquired how many companies engage in CSR. In the introduction to this question, we stated that corporate social responsibility concerns various environmental aspects (e.g. reduction of CO2 emissions, energy consumption, water consumption and hazardous waste), but also social aspects (e.g. the provision of equal opportunities to women, job opportunities for disadvantaged people, training of employees and safe working conditions).[9] From the companies that completely filled the survey, only 7% denied that they engage in CSR thus defined, whereas 32% stated that they do, but unconsciously and 62% stating that they (consciously) engage in SR. The remark of Jamali et al. (2008) that SMEs are often unknowingly socially responsible is therefore not confirmed. For the last group we also asked in which year their enterprise started to consciously engage in CSR activities. Figure 3.8 shows that a substantial part of 44% started already before 2000, indicating that many companies in our sample are already known with CSR for a number of years.

Figure 3.8 Starting year engagement in CSR (in %)



3.4.1 Output

Table 3.21 reports the use of instruments (output), which might be the direct consequence of CSR commitment. The relationship with external stakeholders can be enforced by an active dialogue with NGOs, cooperation with other companies in the supply chain, partnerships with professional training institutes (technical schools, laboratories, etc.), and participation in local initiatives of governments or social organizations to achieve CSR objectives. Comparatively, a dialogue with NGOs is least usual.

Instruments to improve the CSR awareness within the firm are CSR training of managers and other employees (Ulrich et al., 1998; RARE, 2006) and CSR dependent remuneration schemes. As Yu (2009) argues, workers should be involved in the process of code implementation, because they are always closest to problems in a factory. Without workers' participation, it is impossible to achieve effective implementation of CSR designed to protect workers' interests.

Table 3.21 shows that linking the remuneration of managers to their CSR performance is still rare, whereas CSR training is a bit more common in most countries.

An instrument to fight abuses within the company is to appoint a confidential person for employees, in whom employees can trust and can communicate abuses on the shop floor to when, for example, their direct boss is involved. The confidential person can provide first help to the victim, recommend the possibilities for further action, guide the process and play an intermediary role between the victim and the offender. In this way, legal procedures can sometimes be prevented and structural action can be undertaken to improve the situation (Kaptein and Buiter, 2001). The ethics committee, the human resource manager or a member of the workers' council can all have a similar function. The presence of an ethics committee is a clear signal to the organisation's members. The presence of confidential persons and/or whistleblower procedures varies for different countries. In UK and some continental European countries (particular Austria and the Netherlands) a substantial number of SMEs do have this kind of procedures, but in Mediterranean countries it is very unpopular. An ethics committee is also not very common among SMEs.

A company can use several tools developed by CSR training institutes (like CSR score cards or other assessment tools) or make use of certifications. The most common instrument is a certification for product and process quality (the ISO9001 family), the least common instrument is SA8000 certification (which is only relevant for certain sectors, like textile). Environmental certifications are also not very common. Its presence is most observed in UK, Scandinavia and continental Europe. Furthermore, companies may apply sector specific certifications. In the Dutch construction sector, for example, the VCA certification (which focuses on health and safety issues) is very common among SMEs.

Table 3.21 CSR output (in %)

	UK	Mediterranean	Scandinavia	Continental	East	Total
Dialogue with NGOs	24	11	18	20	29	17
Cooperation in supply chain	49	30	42	46	37	38
Partnerships with training institutes	42	34	34	41	35	36
Participation in local initiatives	44	35	45	50	53	43
CSR Remuneration management	7	5	3	14	8	8
SR Training program	39	32	20	32	28	30
Confidential person and/or whistleblower procedure	49	7	13	36	22	20
Ethics committee	19	12	7	12	10	11
SR tool	29	25	18	26	19	24
ISO 9001-03	61	51	30	43	42	46

ISO 14001 /EMAS or GGP	33	12	19	21	12	16
SA 8000	3	3	1	1	1	2
Other	19	14	13	26	13	18

Overall, Table 3.21 shows that the majority of firms do not implement formal instruments to foster integration of CSR in their organisation. On the one hand, the use of formal instruments may be too costly for SMEs as time, finances and a lack of skills and knowledge are commonly identified as constraints to CSR by SMEs (Studer et al, 2006; see also Table 3.12). Due to a lack of sources and experience, they are less familiar with CSR instruments (Lepoutre and Heene, 2006). In contrast, a large firm can spread the costs of CSR over a substantial larger turnover. On the other hand, SMEs have also less need of formal instruments because of their relatively small scale. Because of the strong example of and guidance given by the leader of the organization, CSR can be carried out more easily in SMEs than in more complex business organizations and are therefore more often organized on an informal basis – and so are their CSR policies.

3.4.2 Issue specific implementation

Application of general instruments will allow companies to improve the CSR outcome per concrete issue. But this link between general instruments and CSR outcome per concrete issue is mediated by measures at the issue-specific level. We distinguish four types of indicators of the implementation of CSR at the issue-specific level: the effort that companies spend on improving specific CSR issues, use of methods to measure their performance, use of targets for improving the realisation of the respective CSR aspects and whether it reports the realization of the targets. The effort may include certifications, but SMEs may also implement other measures to improve their social performance. During the pilot interviews for the SME survey, SME managers pointed that informal mechanisms and measures are more often used than formalised programs or schemes.

Table 3.22 Issue specific implementation (in %)[10]

	Effort			**Performance measurement**	**Target**	**Reporting**
	no	**incidental**	**Continuous or certification**			
Share of women in board and/or executive positions	41	32	27	11	11	12
Share of employees recruited from disadvantaged groups	41	41	18	12	12	14
Work-life balance	20	42	39	11	18	15
Reduction in work place accidents and sickness absence rate	8	22	70	28	29	29
Employee training	6	38	56	22	36	29

Labour conditions of suppliers and respect of human rights	27	26	47	14	17	15
Reduction of CO2 emissions	28	28	44	22	18	14
Reduction in energy consumption and/or and increase in renewable energy	17	32	51	27	26	20
Reduction in water consumption	24	32	44	25	20	18
Reduction in waste and/or increase in recycling of waste	11	25	66	23	29	22
Environmental conditions of suppliers	33	31	46	14	13	12

Table 3.22 shows that social aspects of CSR safety and health issues and human capital receive most attention. SMEs put most effort in reduction in work place accidents and sickness absence and in training of their own employees. The reason might be that these social aspects immediately affect the operation cost and competitiveness of the company. However, improvement of labour conditions in the supply chain is also an important item; almost 50% of SMEs say that they put continuous effort in improving these. Least effort is put into fostering the presence of women in top management of the company and recruitment of employees from disadvantaged groups.

Half of SMEs continuously put effort to improve their environmental performance, particular the reduction or recycling of waste. Another substantial part of companies pay incidentally attention to the environmental dimension of their operations. This leaves only a small minority of SMEs that does not pay any attention to these aspects. An exception concerns the environmental conditions of suppliers, maybe because SMEs feel incapable to change the conditions in the chain because of the lack of market power or because taking responsibility for the complex supply chain in which they operate is simply too costly (Jenkins, 2009).

Only a small minority attaches such a high priority to improving CSR that performance is measured, concrete targets defined and realisation of these targets reported to guide their policies. This even holds for health and safety, employee training and most environmental aspects. Notwithstanding that they put substantial effort to improve, only one out of four companies measures, targets and reports performance. For the other CSR aspects, one out of eight companies employs these procedural measures. This indicates that a substantial part of SMEs organize CSR in a rather loose or informal way.

3.4.3 Outcomes

Outcomes are measured both in absolute levels and in changes between 2007 and 2010.[11] A major problem is that a substantial part of the companies responded that they do not know the

outcome level. When exact answers are not available, the respondents were invited to provide their best estimate. But they could also fill in the option 'Do not know'.

For social outcome levels, most companies were able to fill in (or guess) their performance. For environmental outcome levels, four out of five companies used the option 'Do not know'. This is roughly in line with the results of Table 3.22 that a small part of the SMEs measures their environmental performance. The reason why more companies filled in social performance might be that it is easier to guess their social performance, even when they do not formally measure them.

Table 3.23 % of respondents that filled in absolute levels of outcomes

Share of women in board and/or executive positions (%)	80	CO2 emissions (tons)	9
Share of recruitments from disadvantaged groups (%)	71	Energy consumption (kHw)	23
Overtime hours as % of total FTEs	57	Use of renewable energy (kHw)	13
Collective bargaining coverage (%)	78	Water consumption (liter)	17
Sickness absence rate (%)	66	Waste production (tons)	19
Share of permanent employment contracts (%)	83	Share of waste recycled (%)	34
Average length of contract (in years)	100		
Annual hours of training of employees per fte	58		

Since most of (the absolute levels of) environmental outcomes is not comparable for different types of companies, Table 3.24 only presents the social outcomes and the share of recycling of waste.

Table 3.24 Absolute levels of outcomes

	UK	Mediterranean	Scandinavia	Continental	East	Total
women in board and executive positions (%)	21	22	22	20	34	23
Inflow disadvantaged groups (%)	10	5	8	9	10	7
Overtime hours as % of FTE	7	4	6	7	6	6
Coll. bargaining coverage (%)	26	88	65	65	34	71
Sickness absence rate (%)	3.4	4.8	3.4	5.0	6.5	4.7
Share permanent employment (%)	91	80	83	80	77	81
Length of contract (years)	10	14	13	13	11	13
Training employees	32	31	31	33	35	32

(hours per fte)						
Recycling of waste (%)	56	67	59	58	49	62

Table 3.24 shows that the share of women in the board or executive positions is highest in East European countries. The share of employees recruited from disadvantaged groups (e.g. ethnic minorities, people with disabilities, long term unemployed) is highest in UK, France, Hungary and Sweden, but comparatively low in Austria, Finland and Italy. These differences may probably be caused by differences in ethnic diversity for different countries. Fearon (2003) shows that ethnic fractionalization in UK, France, Hungary and Sweden is (substantially) higher than in the other European countries reported in Table 3.26 (except Spain). The number of overtime hours as a % of FTE varies from 4% in Mediterranean Europe to 7% in Continental Europe (particular Austria). The share of employees that are covered by collective bargaining agreements varies substantially with low coverage rates in UK and East Europe and very high coverage rates in Mediterranean countries. The sickness absence rates are highest for East European countries and, to a lesser extent in continental Europe (particular Germany shows relatively high rates). In all countries, a vast majority of the employment contracts are permanent. This does not seem to affect the average tenure of employees which is lowest in the UK.[12] The total number of training per employees[13] is about 2% of total annual working hours. Finally, the share of waste that is recycled appears to be substantial (except for Hungary).

Figure 3.9 and 3.10 presents the changes in social and environmental outcomes between 2007 and 2010. Seven options were distinguished. The cut off values of the options differed in order to optimize the fit with the supposed distribution. For most aspects we used specification 1 (see Table 3.25). For ‘share of employees recruited from disadvantaged groups as % of total inflow’, ‘Number of overtime hours as % of total FTEs’ and ‘Sickness absence rate’ we used specification 2.

Table 3.25 Change in outcomes between 2007 and 2010: measurement

Specification 1	Specification 2
1 Decreased by more than 5%	1 Decreased by more than 2%
2 Decreased by 3-5%	2 Decreased by 1-2%
3 Decreased by 1-3%	3 Decreased by 0,5-1%
4 Not changed very much	4 Not changed very much
5 Increased by 1-3%	5 Increased by 0,5-1%
6 Increased by 3-5%	6 Increased by 1-2%
7 Increased by more than 5%	7 Increased by more than 2%

The distributions in Figure 3.9 and 3.10 show that a major part of the SMEs estimates that their CSR outcomes did not change significantly between 2007 and 2010. In contrast, for environmental aspects a substantial share of companies reports a reduction in energy or water consumption and waste.

Overall, there is a slight improvement in all social and environmental aspects. This is confirmed by Table 3.26 that presents the average change, which shows that the share of women,

recruitment from disadvantaged groups, collective bargaining coverage, share of permanent employment, use of renewable energy and recycling of waste slightly increased between 2007 and 2010, whereas the share of overtime hours, sickness absence rates, CO2 emissions, energy and water consumption and waste production slightly declined during this period.

Figure 3.9 Change in social outcomes

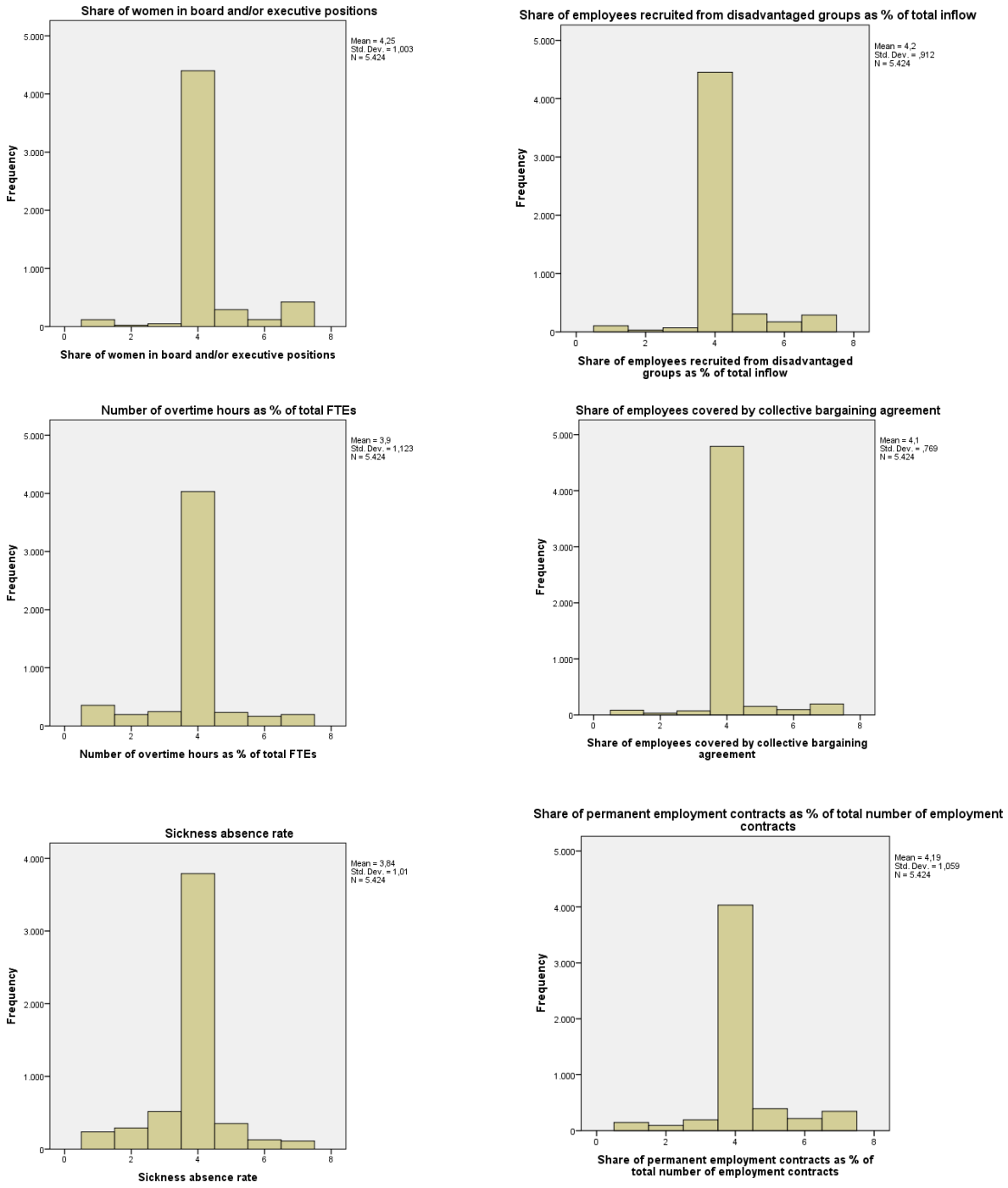


Figure 3.10 Change in environmental outcomes

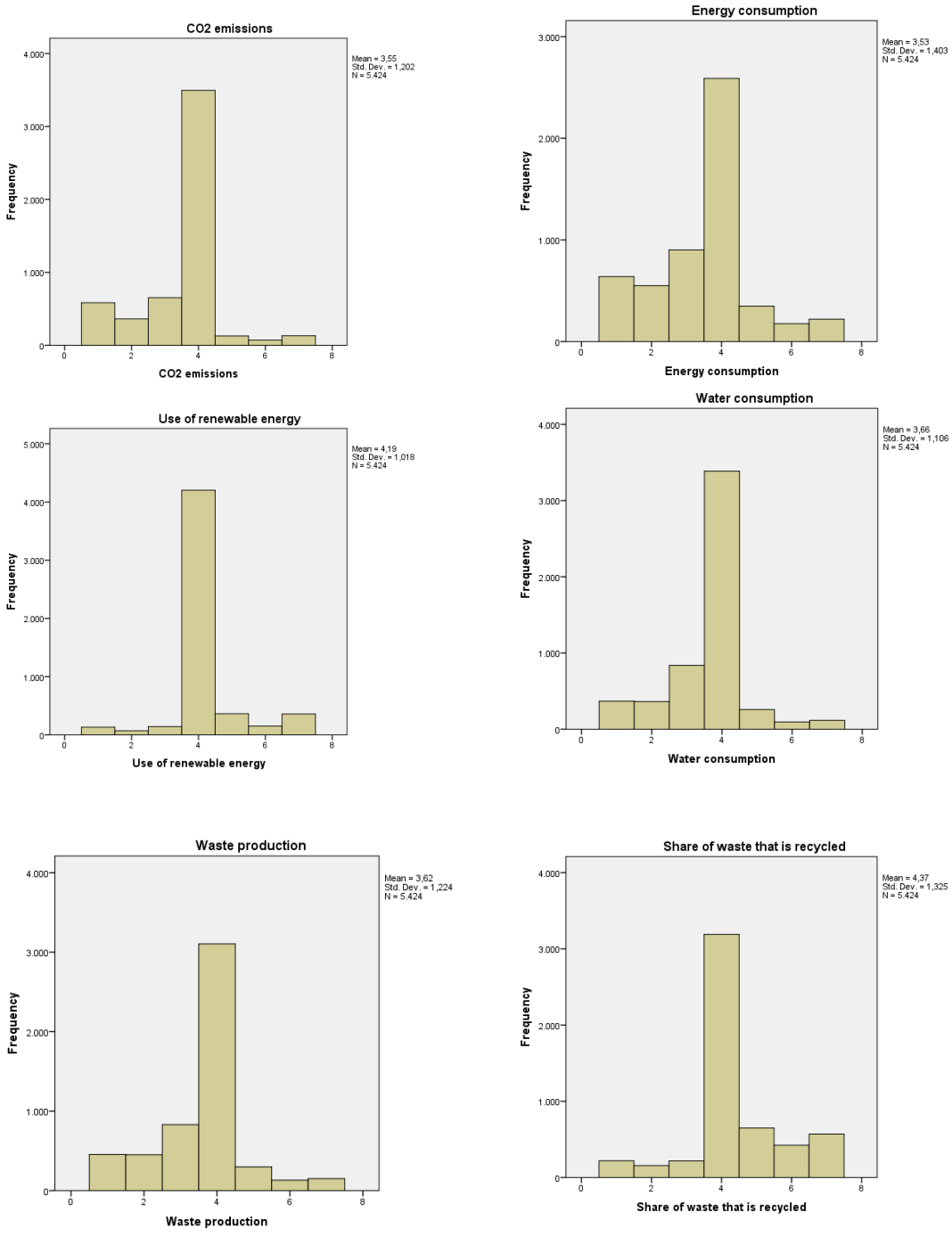


Table 3.26 % change in outcomes of social and environmental aspects

	UK	Mediterranean	Scandinavia	Continental	East	Total
women in board	0.5	0.2	0.4	0.6	0.3	0.4
disadvantaged groups	0.1	0.1	0.2	0.2	0.1	0.2
overtime hours	-0.2	-0.2	-0.1	0.1	-0.0	-0.1
Coll. bargaining coverage	-0.1	0.2	0.1	0.2	0.1	0.2
sickness absence rate	-0.3	-0.1	-0.2	-0.1	-0.0	-0.1
permanent employment	0.3	0.4	0.1	0.4	0.2	0.4
CO2 emissions	-0.9	-0.6	-0.7	-0.8	-0.7	-0.7
energy consumption	-1.2	-0.7	-0.8	-0.7	-0.6	-0.5
Use of renewable energy	0.2	0.2	0.1	0.3	0.1	0.3
water consumption	-0.7	-0.6	-0.5	-0.4	-0.5	-0.5
waste production	-0.9	-0.6	-0.6	-0.6	-0.6	-0.6
Share of waste recycled	1.2	0.6	0.5	0.6	0.4	0.6

If we compare the changes for different countries, there are a few exceptions. For example, in continental Europe overtime hours slightly increased, whereas in the UK the share of employees covered by collective bargaining did not increase. As the difference in changes is only marginal, we should take care in drawing conclusions though.

Improvement in social and environmental aspects may result from several causes: own voluntary initiatives of companies, collective initiatives such as initiatives in the supply chain and/or industry or legally enforced requirements. In the survey, we asked the respondents to indicate for each social aspect which of these causes contributed *most* to the improvement on that aspect. The results are reported in Table 3.27. The last column shows that many companies experienced no improvements in social or environmental dimensions. But for those who did, a vast majority of SMEs indicate that the improvements are due to their own voluntary initiatives. Only in a few cases, other causes were perceived as the dominant cause for the changes reported. This shows that CSR as characterized in the IMPACT project (namely as 'a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with stakeholders *on a voluntary basis*') is very relevant for our sample. This seems to contrast earlier findings in literature that SMEs favour external forms of regulations rather than self regulation, because this generates a 'level playing field' that allows them to concentrate on the economic aspects and leave social and environmental aspects to the government (Williamson et al., 2006).[14] With self-regulation, they fear that free-riders would gain competitive advantage. In line with this, Studer et al. (2006) find that legislation remains the key driver for SMEs to engage in environmental change. According to Williamson et al. (2006), this implies that the use and development of existing regulatory structures, providing minimum standards for many activities covered by CSR, remains the most effective means to influence behaviour of SMEs. On the other hand, a study by Petts et al. (1999) shows that managers of SMEs believe that regulation on its own will not be sufficient because of the inadequacies of the regulatory regimes and that they view the reputation mechanism as a pressure at least as effective as the threat of prosecution.

Table 3.27 Reason for improvement in outcomes (%)

	Voluntary own company	Collective initiative industry	Legal requirement	Not applicable
Share of women in board and/or executive positions	37	1	4	35
Share of employees recruited from disadvantaged groups as % of total inflow	30	1	13	55
Number of overtime hours as % of total FTEs	44	2	8	46
Share of employees covered by collective bargaining agreement as % of total number of employees	29	2	15	54
Work place accidents & sickness absence rate	51	3	12	34
Share of permanent employment contracts as % of total number of employment contracts	46	1	9	43
CO2 emissions (tons)	38	4	14	44
Energy consumption (kHw)	59	4	7	31
Use of renewable energy (kHw)	36	4	8	54
Water consumption (liter)	51	3	7	40
Waste production (tons)	46	4	8	42
Share of waste recycled (%)	50	4	11	34

In the survey for large companies, companies were asked to what extent they aim to go beyond current or anticipated government regulation. On a scale of 1 to 5, the average score was 3.8. Only 3.4 % of the companies stated that they aim at meeting current or anticipated government regulation (option 1). This indicates that voluntary initiatives are also important for large companies.

3.4.4 Innovation

Table 3.28 presents some outcomes for innovation. The table should be interpreted with care, as the motives are measured with different scales for large companies and SMEs. Furthermore, not each issue that was asked for in the SME survey also implies to large companies (and vice versa), indicated by some blank cells. Still, Table 3.28 shows that for both large companies and SMEs, increasing market share is the most important motive for innovation, whereas meeting government regulation is the least important one. Furthermore, there is a remarkable difference regarding improving health and safety, which receives very low priority from large companies in comparison to SMEs.

For the large companies, 73% states that it has a department for research and development, indicating that innovation is an important issue. For SMEs we measured the extent that the company introduced new or significantly improved products or services and introduced new or significantly improved production or organizational processes since 2007. Both receive relatively high average scores, indicating that SMEs qualify themselves as quite innovative (which is in line with their response to business culture that most SMEs have an open system culture). The question on expenditure on innovation was, however, only filled in by 1/3 of the large companies

and SMEs. For those who filled in this question, the share of innovation expenditure as a percentage of turnover seems higher for SMEs than for large companies. Only 15% of large companies filled in the question on expenditures on investments in CSR related aspects. Again, the outcomes indicate that environmental issues receive more priority than social issues.

Table 3.28 Innovation

Motives for innovation	Large[a]	SMEs[b]
It increases market share	3.7	5.2
It allows entering new markets	3.1	
It reduces production costs per unit output	2.5	4.9
It helps to meet government regulation	1.5	4.3
It improves the health and safety of your employees	1.5	4.9
It reduces your environmental impact and/or your material and energy costs	2.7	4.7
Innovation	Large	SMEs
Department for research and development (%)	73	
Introduced new or significantly improved products or services		4.7
Introduced new or significantly improved production or organizational processes		4.7
R&D expenditure (as % of turnover)[c]	8.0	11.6
Investments in health and safety conditions for employees (as % of turnover) [d]	2.9	
Investments in eco-design, eco-efficient production or processes (as % of turnover) [d]	4.7	

[a] Allocation of 15 points to 6 motives
[b] Mean response to 7 point scale ranging from: 'not at all'(1) to 'very much'(7).
[c] Only 33% of large companies and 32% of SMEs filled in this question.
[d] Only 14% of large companies filled in this question

4 EXISTING CSR DATASETS FOR LARGE COMPANIES15

As described in chapter 3, for SMEs data on CSR commitment, output, implementation and outcome were derived from the SME survey among 12 European countries. For large companies, a survey was not necessary because several systematic databanks of CSR of large companies already exist. These databanks are not limited to best practices only and are therefore very useful for large scale econometric analysis. Each of them covers a variety of CSR dimensions. We have gained access to three of these large databanks: Sustainalytics, ASSET4 and KLD. As KLD data mostly refer to US companies, they are of less interest to this research program. However, because this data has often been used in scientific research, we compare KLD with Sustainalytics in Appendix 1. In this chapter, we focus on the two databanks used in WP2, Sustainalytics and ASSET4.

In this chapter we will perform a comparative analysis of both databanks. This provided insight into the robustness of the two CSR data systems. If there is substantial divergence in the results, this may (although not necessarily) undermine the concept of these ratings, e.g. providing transparency with respect to investment decisions. But if there is substantial convergence, this provides more trust in the reliability of both measurement systems. By looking at companies that are present in both indices a conclusion can be made as to what level these two indices agree and disagree on the level of CSR of those companies. In addition to simply looking and analysing the rating outcomes an attempt will be made to construct new scores by aligning the manner in which companies are rated to see if this will improve the level of convergence.

The contents of this chapter are as follows. Section 1 provides a short introduction into some previous literature on measurement of CSR. Section 2 describes the methodology of the comparative analysis. In section 3 the rating systems of Sustainalytics and Asset 4 databanks will be described. In section 4 we present the results of a comparative statistical analysis of the overall CSR ratings of Sustainalytics and ASSET4 and its various sub indicators. Section 5 presents the main conclusions.

4.1 Introduction

CSR ratings are potentially important sources of information for financial policies in the market. A striking example was when in July 2006 TIAA-CREF, the largest US retirement fund, decided to sell 1.2 million shares of Coke after KLD Research & Analytics removed it from its list of socially responsible companies (Wilbert, 2006). These shares were worth $54.2 million and were part of social choice account portfolios. The reason behind this removal was that KLD had concerns about the company's labour and environmental practices in the developing world.

Although this is a very appealing example it could have been an isolated incident. In order to provide more systematic indication that CSR ratings influence market behaviour, Cellier and Chollet (2010) have researched stock price fluctuations around CSR rating announcements. They establish that CSR rating announcements have an overall significant positive impact on the stock market, which confirms that CSR rating announcements are incorporated in stock prices. This is in line with previous research of Hamilton (1995) who found a significant negative impact of the release of information on the use of toxic chemical on stock prices in the US. Related is the research by Klassen and McLaughlin (1996) who found significant positive abnormal returns after

a firm receives environmental performance awards, and significant negative returns after environmental crises.

Besides reactions in the stock market on CSR ratings companies themselves may also respond to the ratings that they receive from rating bureaus. Rees and Mackenzie (2011) examined this by analyzing companies that were in danger of being excluded from the FTSE4Good index. Some firms were approached and told that they were in danger of being excluded while the others, the control group, were not. Subsequently, they analysed whether there was a difference in future performance in FTSE4Good environmental scores between these two groups and found that the companies that were lobbied performed better compared to other firms. Also Chatterji and Toffel (2010) researched if poor CSR ratings encourage better performance. Their sample consisted of 598 US firms from the S&P small or mid-capitalisation indices over the period of 1999 to 2004. They establish that firms that perform badly on the KLD rating were stimulated to improve their environmental performance, which was measured by the amount of toxic emissions, compared to firms with higher rankings or firms that were excluded.

This type of research thus indicates that CSR rating systems do influence market behaviour. However, there is much scepticism about the possibility and reliability of measuring CSR by CSR rating systems. There is up until now no uniform methodology on how to measure “social responsibility”. When two CSR ratings rate the same set of companies one would expect a high degree of resemblance between the two outcomes, but this is not necessary as there might also be reasons for differentiation. This is clarified by Chatterji and Levine (2007). In their measurement theory, ratings may convergence with high validity if they apply the same definition of CSR and both use high quality measurement methods and data. However, if ratings do not converge, they may still be valid. It might be, for example, that the different CSR ratings try to satisfy the demands of different groups of clients. A CSR rating aimed at filtering out which companies to invest in for a religious group may differ from a rating aimed at investment groups interested in better financial results. The first group will most likely not invest in arms and tobacco while the second simply looks at return to investment.

An example of a comparative research of two rating systems is Rees and Mackenzie (2011). They compare FTSE4Good corporate social responsibility scores of 1825 companies in 25 countries with ASSET4 ratings. After they compensate for the fact that ASSET4 measures a company’s performance without risk adjustment they find strong correlations. The ASSET4 corporate governance sub-score correlates strongly with FTSE4Good measures of corporate governance (0.53). The ASSET4 environmental measure had correlations of 0.57 with two FTSE4Good components named environmental management and climate change. Thirdly the social pillar correlated with levels of 0.23 and 0.54 with socially related FTSE4Good components. From these numbers they conclude: ”Thus there is clearly a strong and statistically significant measure of agreement between the scores from the two sources”.

Besides comparing the outcomes of different CSR rating systems, the reliability of CSR ratings has also been researched by confronting the ratings with external sources. An early example is Scharfman (1999) who took the Fortune corporate reputation survey as well as an index that measured how many times a firm was part of a fund portfolio known as “social choice” mutual funds as benchmarks and compare these to KLD scores. They find that their KLD scores correlate with the two other CSR indicators with values ranging from 0.18 to 0.55. From these

correlations they answer their question if the KLD ratings correlate sufficiently with other measures of corporate social performance with a qualified “yes”.

In a more recent research Chatterji, Levine and Toffel (2009) investigate 588 US firms for the period of 1991-2003 for which they have KLD data. They evaluate the CSR rankings by a set of performance metrics including toxic emissions, the dollar value of penalties, the number of penalties, reported chemical or oil spills and permit denials or shut ins. Furthermore they control for company size by including log revenues and log assets and for industry difference by including industry dummies. They find that KLD concerns ratings are fairly good summaries of past environmental performance as well as having predictive value for pollution levels and the number of regulatory compliance violations in later years. KLD environmental strengths, in contrast, do not accurately predict pollution level or compliance violations.

4.2 Methodology

Our sample consists of those firms that were assessed in the years 2008, 2009 and 2010 both by Sustainalytics and ASSET4. Pearson correlations will be calculated between the variables to determine to which extent they are related.

To unravel the differences between the ASSET4 and the Sustainalytics ratings we will apply a top-down analysis. The overall CSR score is a weighted average of the underlying sub scores:

$$(1) \qquad \text{CSR score} = \sum (w_i\, s_i)\text{Score} = \sum_{i=1}^{n} w_i . s_i$$

Where w is the weight attached to each score and s the sub-score. By multiplying the weights with the scores and adding them up the final CSR rating is calculated. The first analyses will be done at this highest level. Both ASSET4 and Sustainalytics provide final scores in their datasets and the first step is to compare these scores and see how they are correlated to one another and how the variance in one can predict values of the other, e.g. the R^2.

Next, we dissect the overall scores and see if the correlation can be improved if the weights used are identical. Because ASSET4 uses an equal weights system, this step involves the manipulation of the Sustainalytics weights by also equalising them. Furthermore, whereas ASSET4 adopts an economic sub-score, Sustainalytics does not and therefore we set the weight of the economic sub-score at 0. After manipulating the two overall CSR scores for these two differences the following formula appears:

$$(2) \qquad \text{CSR score} = (1/3)*\text{Social score} + (1/3)*\text{Env. score} + (1/3)*\text{Governance score}$$

The goal is to see if after making these changes we can improve the correlation and prediction power between the two ratings. To further validate these findings, we will also use a complementary strategy by applying Sustainalytics weights to the ASSET4 data.

In the third step we compare the sub-scores for the social, governance and environment pillars. This is a relative straightforward process since both ratings provide the sub-scores for the environmental, social and governance pillars and these will be compared in the same manner as

done before, e.g. correlations and R^2. This will provide a first insight into whether possible differences stem from a single sub-score, a combination of sub-scores or from random noise.

Moving down, we next investigate how the sub-scores are created at the lowest level of aggregation.[16] Each sub-score is the product of underlying categories multiplied by their respective weights. To compare the sub-scores, the methodology is used as described above by making weights comparable. Before we can start constructing new scores based on comparable weights and indices a comparison will have to be made of how the indices are defined at this level. For each Sustainalytics indicator a matching ASSET4 indicator will be searched for by using the indicator definition files of both ratings. Once we have two sets of indicators with scores constructed in a similar fashion, we can start rebuilding new sub-scores using equal weights. First, however, a selection needs to be made as to which indicators will be included in these new sub-scores. Due to the fact there is no information on all matched indicators in both ratings the indicators with a large number of observations will be chosen as to limit the loss of information. Once we have these new sub-scores we will correlate them again and compare the results to the analyses described before.

4.3 The rating systems of Sustainalytics and ASSET4

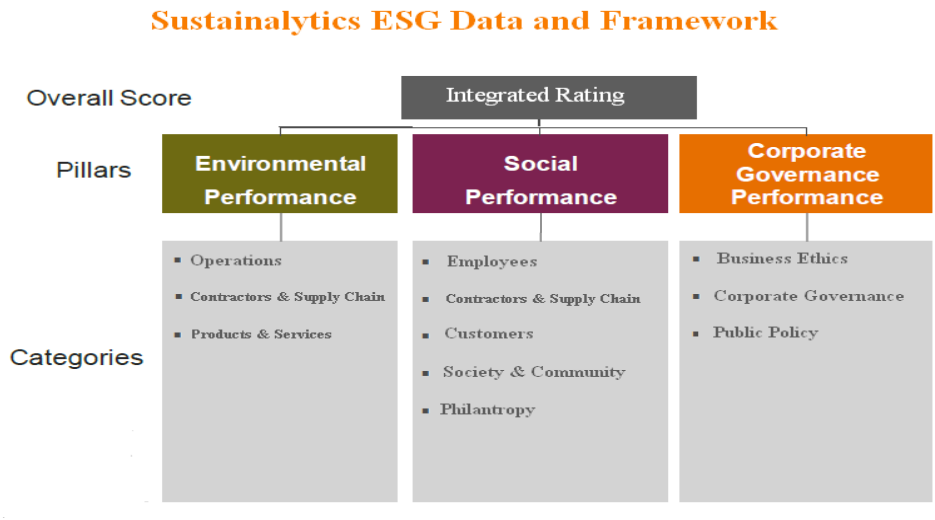
4.3.1 Sustainalytics

Sustainalytics is formed from the Canadian founded Jantzi Research Inc., and the European founded Sustainalytics. These two companies merged in 2009 to become, as they call it themselves, a global leader in ESG research and analysis. The companies in their dataset are based on several sources in which they distinguish the core universe from the research universe. The former is the MSCI World Index complemented by a selection of relevant local indices. In the data from 2010 these include the S&P 500, the TSX Index, the Jantzi Social Index and the AEX[17]. The research universe consists of all the companies in the core universe, supplemented by companies that result from specific client requests, which are mainly institutional investors.

The issues that Sustainalytics researches can be constructed like a tree. Three main pillars are distinguished: Environment, Social, and Governance. Below this level several topics are distinguished like Operations, Products and Services and Employees (see Figure 4.1). Below these topics we find various indicators. Research is ultimately conducted at the indicator level. Sustainalytics use two kinds of indicators templates. A full template is used for all companies on the MSCI World Index. Junior templates may be assigned to companies outside of the MSCI, when those companies have lower market cap thresholds (below 2 billion) and less exposure and/or interest. Junior templates contain fewer core and sector specific indicators than full templates.

The full template consists of 160 indicators. These indicators are divided into two different types, core variables and sector-specific variables. The core indicators are applied to every company in the database. The sector-specific indicators are only assessed for the companies for which they are relevant. In total, there are 64 core indicators and 96 specific-sector indicators. Within each of the two classes of indicators (core and sector-specific), Sustainalytics roughly distinguishes indicators on policies and policy statements, programs and management systems and on outcomes.

Figure 4.1 System Sustainalytics



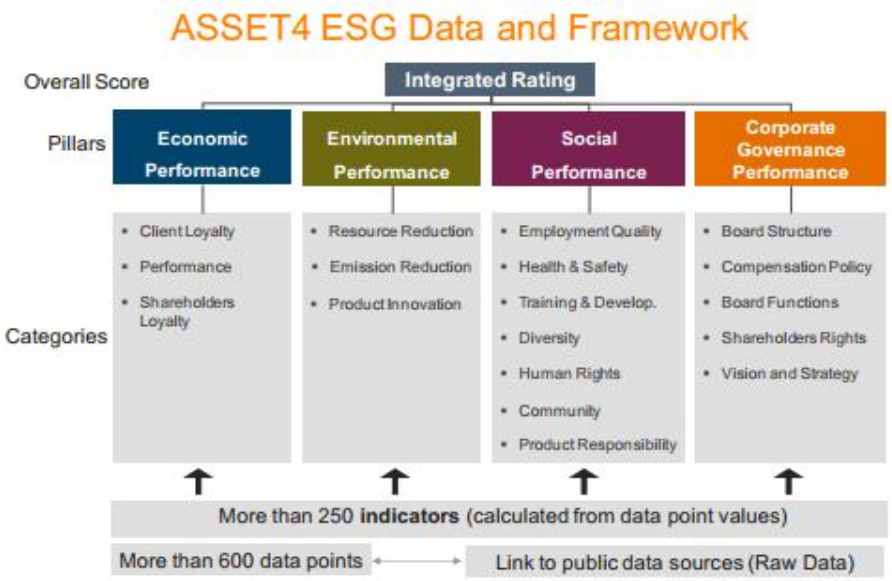
Sustainalytics uses scores between 0 and 100 to express the quality of the company's performance. When information is not available for a company it is still given a score for an indicator. The exception to this rule is that when the lack of data is not due to the company. For example, if companies did not respond to the questionnaire of the Carbon Disclosure Project (CDP), the indicator is deactivated for companies that were not contacted by the CDP. Furthermore, the Sustainalytics ESG platform contains 10 special indicators on whether companies are involved in certain controversies or incidents. These indicators are found for every topic, except philanthropy. Controversy indicators are seen as very important and therefore carry a weight of 3% in the Sustainalytics default weight matrix.

To calculate the total score of the company, as well as aggregate scores on the three themes, Sustainalytics uses a default weight matrix. The weight of the topic is simply the summation of the weights of the relevant indicators for the peer group. Logically, the total weight of a theme is the summation of the weights of the topics. The total of the weights of the themes adds up to 100%. To give an impression about the weights of the themes, the averages weights of the themes Governance, Social, and Environment are respectively 25.8%, 38.4%, and 35.8% for the total dataset of senior companies. These weights are different for every peer group, depending on the relevance of the theme for the total company score. Sustainalytics groups the evaluated companies into 42 different peer industry groups. So every peer group is evaluated by a different set of indicators.

4.3.2 ASSET4

ASSET4 was founded in 2003, taken over by Thomson Reuters in 2009 and their headquarters are located in Zurich Switzerland. The ASSET4 universe includes over 3000 public world companies and covers major indices: S&P 500, MSCI World Index, Nasdaq, FTSE350 and MSCI World Index. The main customers of ASSET4 are from the financial sector. The company collects and analyzes data from company reports, company websites, NGO websites, newspapers, journals, and trade publications but the sources of most ESG data are CSR reports created by the company themselves.

Figure 4.2 System ASSET4



Analysts at the company are assigned a company. There are guidelines to fill in the documented answers and customer contact is handled by an analyst from a different team. They use a yearly unbalanced panel with systematic environmental, social and governance data. For these scores they use 278 key performance indicators and over 750 individual data points. All data must be objective and publically available, though analysts are permitted to contact company investor relations offices to learn the location of public data. ASSET4 uses a multiple step approach to create “score” indicators. First, they answer a set of questions related to the score by yes/no or number values, like percentages and dollar amounts. Based on the answers on these questions, a value is created. This value is subsequently translated into a score between 0 and 100. This score shows, according to ASSET4, how the company performs compared to the entire ASSET4 universe. The way how values are transmitted into scores is, however, not clear.

The CSR scores are then combined into eighteen category scores, which serve as subcomponents of the four pillars. Each of the eighteen categories receives a score between 0 and 1, with high scores indicating strong performance in the category. Similarly, the overall company score, which ASSET4 calls the Integrated Rating, is computed by blending the four pillar scores.

4.3.3 Descriptives

Table 4.1 gives an overview of the descriptive statistics of the Sustainalytics and ASSET4 dataset. Several things are worth mentioning. First, Sustainalytics has a much smaller spectrum in which their final scores fall, between 28.85 and 87.46, compared to ASSET4 which has scores between 2.36 and 97.50. This naturally leads to a much higher standard deviation for the latter. If we compare the sub-scores of the social, environmental and governance pillars, we find a similar pattern although the variation in Sustainalytics scores increases. Second, the averages are still reasonable close to each other. An important difference in methodology is that Sustainalytics (normally) gives a score of 0 when there is no information available, whereas ASSET4 does not

include an indicator on which it has no information. One would therefore expect higher scores for ASSET4 on average but this is apparently not the case. Third, there is a large increase in the number of firms between year 2009 and 2010 for the Sustainalytics dataset because of the merger with Jantzi in 2009. This is only good for our analyses since it will most likely lead to a larger overlap in firms.

Table 4.1 Descriptives of ESG scores in Sustainalytics and ASSET4

	N	Minimum	Maximum	Mean	Std. Deviation
Overall					
Sus-08	1135	29.10	78.30	51.43	9.06
Sus-09	1152	33.59	86.69	55.30	9.67
Sus-10	4117	28.85	87.46	51.95	8.85
A4-08	2921	2.36	97.50	49.96	30.66
A4-09	3353	2.91	97.35	49.62	30.76
A4-10	3876	3.09	96.84	49.91	31.00
Social					
Sus-08	1135	25.56	82.71	49.63	11.25
Sus-09	1152	26.67	89.43	54.06	11.78
Sus-10	4117	25.88	89.42	51.62	10.33
A4-08	2921	3.36	97.93	49.76	30.90
A4-09	3353	3.87	97.69	49.43	30.97
A4-10	3876	3.59	97.58	49.41	31.12
Environment					
Sus-08	1135	21.50	91.67	49.65	11.81
Sus-09	1152	25.37	91.02	52.45	12.25
Sus-10	4117	8.57	94.00	46.22	12.53
A4-08	2921	9.59	94.10	49.54	32.07
A4-09	3353	9.43	94.26	49.32	32.05
A4-10	3876	8.90	94.75	49.31	31.98
Governance					
Sus-08	1135	30.80	94.40	57.18	9.69
Sus-09	1152	33.63	94.40	61.68	10.72
Sus-10	4117	26.28	94.40	60.96	10.25
A4-08	2921	1.39	97.06	51.72	30.25
A4-09	3353	1.33	97.03	51.55	30.17
A4-10	3876	1.73	96.38	51.82	30.37

4.3.4 Matching of sub indicators

The most comprehensive step in this research involves looking at the individual indicators of both ASSET4 and Sustainalytics and trying to match them in the attempt to create new sub- and overall scores.

The Sustainalytics indicator list was the starting point for this step of the research. For each indicator the ASSET4 dataset was searched to find an as good as possible match based on the definitions provided by both rating systems. Out of 156 Sustainalytics indicators 63 matches were

found in the ASSET4 dataset. Table 4.2 gives one example to illustrate how we matched the sub indicators.

Table 4.2 Matching the sub-indicators at the disaggregate level: an example

Sustainalytics indicator	ASSET4 indicator	Pearson Correlations
G.1.1 *Policy on Bribery and Corruption*: 0=no/50=weak/100=strong. This indicator provides an assessment of the quality of the company's policy to combat bribery and corruption.	**SOCODP0017**: *Community Reputation Policy Elements/Bribery and Corruption*: Yes/No. Does the company have a policy to avoid bribery and corruption at all its operations?	2008: 0.535** N=962 2009: 0.549** N=54 2010: 0.547** N=968

Out of the 31 Sustainalytics governance indicators 21 ASSET4 matches were found. For the total environmental pillar there were 26 indicator matches out of the 54 possible. For the social pillar there are only 16 matches out of the 54 possible. Unfortunately, for some matched indicators the number of observations was very low. Mostly, this was due to the fact that ASSET4 has only information on industry or sector specific indicators for a limited number of companies.

Furthermore, it should be noted that even at the lowest level of aggregation, the fit in the scores was not perfect (see also the third column in Table 4.2). Even for indicators like employee turnover rate, fairly low correlations were found, while it would seem that it is a simple number that can be looked up in the books. This research can provide no answers as why these differences occur but it does illustrate that even at the simplest level indicators that seem to measure the same thing can produce different outcomes. This indicates that even at the disaggregate level for variables with seemingly similar definitions, there are still basic measurement differences that may cause divergence in the CSR ratings of ASSET4 and Sustainalytics.

4.4 Comparative analysis

4.4.1 Overall CSR scores

As a starting point and as an initial benchmark the overall CSR scores of ASSET4 and Sustainalytics are compared. For the year 2008 there are 1023 companies that have received a rating by both companies. When correlated against each other the Pearson coefficient is 0,664, with significance at the 0.01 level (2-tailed). This means that about 44% (R^2) in the variation in the Sustainalytics scores is shared with the ASSET4 scores. Only 56% of the variation is not shared and therefore to be explained by other influences. This means that based on this analysis both ratings seem to measure many common elements. In previous research, conclusions on convergence were based on cut off values of correlation coefficients ranging from 0.2 to 0.6. For instance, Scharfman (1999) found correlations between 0.18 and 0.55 while Rees and Mackenzie (2011) found correlations between 0.23 and 0.57. Both conclude that the correlations are sufficient. For 2009 there are 1028 observations and the Pearson correlation coefficient is 0.657, with significance at the 0.01 level (2-tailed), meaning that about 43% in the variation in the

Sustainalytics scores is shared with the ASSET4 scores. For 2010 there are 3032 observations. For 2010 the Pearson correlation coefficient is 0.634 and the R^2 is 40%.

Because ASSET4 uses four subscores and Sustainalytics three it is not fair to compare the two ratings. Furthermore, ASSET4 uses an equal weights system while Sustainalytics uses custom weights. To correct for these two differences new overall CSR scores were created for both ratings using a weight of a third for the social, environmental and governance sub-scores and leaving out the economic pillar in the ASSET4 rating. For 2008 this provides a Pearson correlation coefficient of 0.682 and an R^2 of 0.465. The same level of improvement can be seen in 2009 where the new Pearson correlation coefficient is 0.705 and the R^2 is 0.497. For 2010 the correlation coefficient is 0.671 and the R^2 is 0.450.

All the correlation coefficients and the R^2's have improved after the unadjusted scores were adjusted. To confirm this improvement we also calculated new CSR scores on the basis of the weights used by Sustainalytics.[18] These results are reported in the third column of table 4.3.

Table 4.3 Results of bi-variate correlation analysis of overall CSR ratings

	Unadjusted CSR score	Equal Weights 1/3	Sustain. Weights
2008 Pearson	0.664**	0.682**	0.703**
R^2	0.441	0.465	0.495
2009 Pearson	0.657**	0.705**	0.712**
R^2	0.432	0.497	0.512
2010 Pearson	0.634**	0.671**	0.748**
R^2	0.402	0.450	0.559

**. Correlation is significant at the 0.01 level (2-tailed)

A further improvement of correlations and R^2's can be seen from this manipulation. Why there is a larger increase than in the equal weights case is not clear, since basically the same effect takes place, e.g. the weights are equalised. It could be due to the fact that we now use forty-seven different weight classes which allow for a better fine-tuning between the two datasets.

4.4.2 Sub-scores comparison

Both CSR ratings also provide sub-scores for the social, environmental and governance pillars. The next step of the analysis involves comparing these scores to see if there are differences between the sub-scores in the level of correlations and R2's. Table 4.4 provides an overview of the results.

Table 4.4 Results of bi-variate correlation analysis of sub scores

	Social	Governance	Environmental
2008 Pearson	0.617**	0.376**	0.648**
R^2	0.380	0.141	0.420
2009 Pearson	0.627**	0.449**	0.640**
R^2	0.393	0.201	0.409
2010 Pearson	0.474**	0.452**	0.639**
R^2			

	0.225	0.204	0.408

**. Correlation is significant at the 0.01 level (2-tailed)

Table 4.4 shows that the social and environmental ratings are highly correlated, but that the governance dimension performs less. Furthermore, the environmental results remain stable over the three measured years while for the social and governance pillar there are fluctuations. Especially in 2010 the correlation for the social score drops significantly. This may be due to the substantial increase in the number of companies in the Sustainalytics data base.

Next, we recalculated the sub-indices by using a set of matched indicators at the most disaggregate level. The goal is to see if, when both ratings use the same types of indicators and weights, the correlation will further improve. The results are reported in Table 4.5. What is striking is the low number of observations we are left with after putting all these indicators together due to the lack of information in the ASSET4 dataset. While Sustainalytics still gives a score when they have no information on a company ASSET4 leaves a black which has significant effect on our results.

When we compare the results of this analysis with the correlation of the original governance scores in Table 4.4 a significant improvement can be seen in R^2 for the governance and social pillar.[19] This means that after the series of transformations the strength of the relationship between the Sustainalytics and ASSET4 rating has increased significantly. For the environmental pillar, no substantial improvement occurs. This is partly due to the change in the sample of companies compared. If we compare the original sub-scores on the smaller sample of companies, the R^2 is much lower than in Table 4.3. This implies that the transformation based on the matched indicators also improves the correlation between ASSET4 and Sustainalytics for the environmental pillar. :

Table 4.5 Sub-scores based on matched indicators

Governance	2008	2009	2010
Pearson correlations	.660**	.680**	.728**
R^2	.436	.462	.530
N	164	125	151
Environmental	2008	2009	2010
Pearson correlations	.537**	.516**	.621**
R^2	.289	.266	.385
N	170	166	328
Social	2008	2009	2010
Pearson correlations	.759**	.753**	.744**
R^2	.576	.567	.553
N	962	947	1743
Overall	2008	2009	2010
Pearson correlations	.614**	.711**	.837**
R^2	.377	.506	.700
N	32	25	25

From the previously calculated new sub-scores new overall scores were calculated. All three pillars were given an equal weight. Table 4.5 shows that for 2008 there were only 32 companies

in both ratings used in calculating the new sub-scores. Comparing the correlation coefficients with the original results in Table 4.3, only the correlation and the R^2 for 2010 substantially improve, which suggests that the approach taken is a step in the right direction. But the extreme low number of observations cannot be ignored.

4.5 Conclusions

In this chapter we investigated the quality of ASSET4 and Sustainalytics rating systems by a comparative analysis that unravels the differences and similarities. In previous research, conclusions on convergence were based on cut off values of correlation coefficients ranging from 0.2 to 0.6. For instance, Scharfman (1999) found correlations between 0.18 and 0.55 while Rees and Mackenzie (2011) found correlations between 0.23 and 0.57. Both conclude that the correlations are sufficient. Our statistical analysis of the ratings of ASSET4 and Sustainalytics shows that we find significantly higher correlations for the overall CSR scores, varying between 0.634 and 0.664. Based on the correlations found and the academic papers discussed we conclude that the two ratings correlate more than sufficient and that they try to measure, at least partially, a part of the same construct.

There are, however, factors that interfere in making a fair comparison between the overall scores. ASSET4 used a fourth pillar sub-score and equal weights, while Sustainalytics used custom weights, which were defined by the industry a firm is in. After we took out these two differences, correlations between overall scores improved to levels between 0.671 and 0.682.

Also for social and environmental sub scores, we overal find very satisfying correlation coefficients. Only for the sub-score on social aspects in 2010, we saw a significant drop in the correlation, but not if we base the comparison on matched indicators. Only for the original governance sub-scores correlations were much lower, which might be related to the fact that these indicators are more difficult to measure for rating agencies, for example because various governance indicators might not apply to all countries due to country specific legislature. In a next step, we investigated in dept how each of the sub scores is constructed. By matching indicators at the lowest of level of disaggregation, we constructed comparable sub indicators based on a similar set of indicators. After the transformation new sub- and overall scores could be created but only for a very small set of companies. The resulting correlations only showed a significant improvement in the fit between Sustainalytics and ASSET4 for 2010. That we do not generally see a drop in the correlation coefficient for 2010 might be explained by a change of indicators in the two rating agencies. Although the answer is far from conclusive, we can say that when the two rating companies use the similar indicators, with similar scores and similar weights attached to them they move closer towards each other and it seems they are measuring a part of the same CSR construct. Nevertheless, we also find evidence that even for similar indicators at the disaggregate level ASSET4 and Sustainalytics find different scores, indicating that part of the differences in scores is due to basic measurement problems rather than differences in definitions.

Comparing Sustainalytics with ASSET4, there is one other issue that is interesting, which concerns the transparency of the ratings systems. On the one hand, we think Sustainalytics outperforms ASSET4. Given the scores at the disaggregated level, the links between disaggregate and aggregate scores is clear and an individual a company should able to recognize its score on all indicators. For ASSET4 this is a different story, because the step from the yes/no questions at the disaggregate level to the creation of values and CSR scores remains

unclear. On the other hand, when you look at individual indicator level ASSET4 does better when it comes to transparency. By using yes/no answers there is less room for subjective judgment. In case more categories are distinguished to take account of the quality of policies, like Sustainalytics does, more subjective elements are added and the level of transparency goes down for the user. The benefit, however, of the Sustainalytics approach is that is can give a more meaningful insight, as it gives more opportunities to state qualitative judgement, instead of only stating yes or no.

Finally, although our analysis may increase the confidence in the ratings of Sustainalytics and ASSET4 now it has been shown that both generate comparable results, we do not yet know for sure that they both give a good approximation of the corporate social responsibility of a company. Because it might be that both ratings do not completely reflect the concept of CSR. Further validation with external data is therefore necessary to confirm convergence validity for both rating systems. Furthermore, even if the two ratings show reasonable similarity, this does not prove that there is a uniform CSR definition. Actually, we have seen that there are a lot of differences in the sets of indicators that Sustainalytics and ASSET4 are using. Still, overall the correlation is quite good. This high correlation therefore does not provide us with a definite idea how CSR should ideally be measured. On the other hand, if we assume that there exists a concept of CSR that can be objectively measured, it seems encouraging that two methods that try to do so provide reasonable similar results. These similarities show that there is a larger chance that these parts do constitute an element of CSR and that this element is measurable. At the same time, lack of perfect correlation makes us aware that an objective measurement of CSR is probably not possible.

5 ECONOMETRIC ANALYSIS OF DRIVERS OF CSR

Notwithstanding the economic crisis, there is a significant and continuous interest in corporate social responsibility (CSR) of companies, as well as from governments and civil organizations and companies. The practice of CSR is most often explained in terms of the 'business case'. The argument is that CSR contributes to the financial performance of the company, which stimulates companies to take up responsibilities that were traditionally addressed by the governments. Research has indeed shown that there is much evidence that the corporate financial performance (CFP) is positively related to CSR (Beurden and Gössling, 2008; Margolis et al, 2007; Orlitzky, Schmidt and Rynes, 2003).

However, if CSR is basically a matter of a 'business case', why do governments put so much stress on stimulating CSR? Because if CSR is in a company's own interest, we would expect that companies take sufficient responsibility for the society's welfare by developing CSR initiatives that contribute to economic, social and environmental value creation. In reality, the data indicate that although companies have increased their CSR strengths between 1991 and 2005 (as measured by KLD), this was more than encountered by a rise in the number of CSR concerns (Lougee and Wallace, 2008). Apparently, CSR is not always a 'business case'. Indeed, the results of empirical studies regarding the link between CSR and financial performance either on the company level or the portfolio level show that a significant positive relationship is not undisputed. There are many studies that find no indication of a superior performance of Socially Responsible Investment (SRI) funds or SRI indices (see e.g. Renneboog et al. 2008a; Schröder, 2007).

Given the ambiguous influence of CSR on profitability, one wonders why companies would take up a pro-active attitude towards CSR. What catalyzes companies to engage in CSR initiatives? In literature, many articles have emerged that research this question from a theoretical or empirical perspective. For example, Campbell (2007) discusses economic and institutional conditions that provide a fruitful ground for companies to take up an active CSR policy. Brown et al. (2010) distinguishes four sets of explanations of CSR, relating to external and internal structure and actors, that partly overlap with the factors described by Campbell, but adds others as well, including, for example, corporate culture and managers' values. Laudal (2011) takes stock of all drivers and barriers that particularly influence CSR of small and medium sized enterprises. However, the empirical surveys described in these articles research a limited set of factors that may potentially affect CSR. There are no empirical researches that test the influence of these factors simultaneously. As many variables relate to each other, it remains uncertain to what extent these partial influences are robust when tested in a broader framework and whether the estimates are biased by omitted variables by incorrectly leaving out one or more important causal factors. Given this present state of research, this chapter makes three important contributions. First, we research the robustness of drivers of CSR when they are tested simultaneously. Second, we research how the influences of various drivers relate to each other. What is the pattern of influences from institutional and other factors on CSR? Third, we test this model on two different datasets, for large companies and for SMEs.

The content of this chapter is as follows. First, we operationalize the conceptual framework for the empirical analysis. Second, as an introduction to econometric analysis, section 2 gives a brief, non-technical introduction into the econometric techniques that are employed in chapters 5-8.

Sections 3 and 4 present the econometric analyses of drivers of CSR for large companies and SMEs.

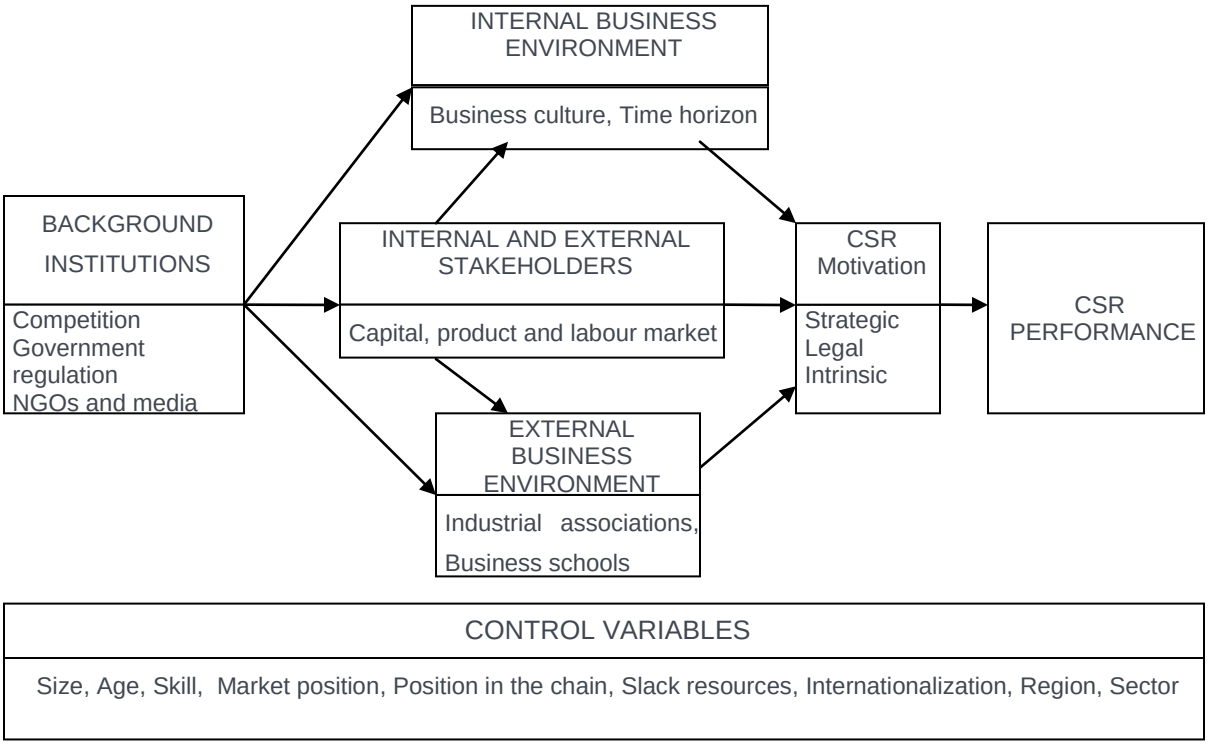
5.1 Operationalization of framework

How a company frames its position and policies with regard to CSR depends on the interplay of various sorts of factors. The IMPACT framework discussed in Chapter 2 (see the red area in Figure 2.1) distinguishes three layers of variables: CSR impact, CSR performance, CSR response and the underlying four types of factors that drive CSR response through TIEs: the internal business environment, internal stakeholders, external stakeholders and the external environment. When applying this framework in empirical analysis, we should, however, also consider possible endogeneity between the four types of factors that drive CSR response. In particular, it is plausible that some of these factors refer to background institutions that influence CSR response through other, mediating, factors. For this reason, we elaborated on the IMPACT framework by explicitly distinguishing the background institutions that may influence CSR response through the internal business environment, internal and external stakeholders and the external environment. In the IMPACT framework, these are implicitly part of the internal and external environment of the compay.

The resulting model generalizes the idea of Brown et al (2010) that external factors influence CSR through various mediators. In particular, in contrast to Campbell (2007), we assume that some background institutions – competitiveness, government regulation and monitoring by NGOs and media – shape intermediate structures such as the stakeholder responsiveness to CSR on capital, product and labor market, industrial self regulation of CSR and CSR education by business schools. The rationale for this causality chain is that if CSR lacks support from fundamental institutions, stakeholders are unlikely to reward good behavior or sanction bad behavior (Brammer et al., 2012). Nor do we expect that without proper institutional conditions in place, industrial organizations will develop collective forms of self governance regarding CSR or that business school will invest in educational programs relating to CSR. Hence, some of the intermediate structures will only flourish if some more fundamental market and government institutions are present.

The operationalized framework is summarized in Figure 1. We assume that background institutional factors influence the responses of internal and external stakeholders on the capital market, product market and labor market and that both shape the attention to CSR by industrial organizations and business schools. Also the internal business environment will be influenced by the external institutional environment. Next, the three intermediate structures – collective self governance, stakeholder response and internal business environment – could influence the CSR motivation of the individual company which could be viewed as direct antecedent of CSR performance. Each of these relationships are controlled for other company characteristics, i.e. company size, age and skill distribution of employees, market position, the position in the chain, the degree of internationalization of the firm, the presence of slack resources, the region where the headquarter is located and the sector in which the company operates.

Figure 5.1 Drivers of CSR: operational framework



5.2 Introduction into econometric techniques

In econometric research, we employ several techniques. In this section, we explain in a non-technical way some basic techniques that will be employed in the econometric analysis and describe the strengths and limitations of econometric analysis.

5.2.1 Methods and instruments of econometric analysis

Before performing the empirical analysis of relationships between various variables, econometricians usually first analyse the sample characteristics to see whether necessary assumptions on which econometric analysis builds are met. Examples are tests for heteroskedasticity and outliers.[20] Another econometric problem that should be considered before testing is the potential concerns of common source bias. If all data are self-reported and collected through the same survey during the same period of time with cross-sectional research design, such as in the case of the SME survey, common method variance, variance that is attributed to the measurement method rather than the constructs of interest, may cause systematic measurement error. This may bias the estimates of the true relationship among theoretical constructs. Harman's one-factor test can be conducted to test the presence of common source bias (Podsakoff et al., 2003). For this test, one can use factor analysis to determine the number of factors that are necessary to account for the variance in the variables. If a substantial amount of common method variance is present, either (a) a single factor will emerge from the factor analysis, or (b) one general factor will account for the majority of the covariance among the variables.

Table 5.1 Overview of econometric techniques

Harman's one-factor test	Factor analysis that tests for common source bias
Bivariate correlation	measures the strength of (linear) association between A and B
P-value	Statistic used to evaluate the significance of a relationship
Factor analysis	Correlates variables in terms of a potentially lower number of unobserved variables called factors
Confirmatory factor analysis (CFA)	Tests the hypothesis that a relationship between the observed variables and their underlying latent construct(s) exists
Cronbach alpha	Test statistic used for confirmatory factor analysis
Explorative factor analysis (EFA)	Identifies factors based on data. There are several techniques for EFA
Multiple regression analysis	Studies the dependence of one variable, the dependent variable, on one or more other variables, the explanatory or independent variables
R^2	measures the strength of the relationship between the independent and dependent variable
F test	measures the joint significance of the independent variables
T test	evaluates the relationship between the dependent variable and each independent variable
Partial regression coefficients	measures the change in the expected value of the dependent variable per unit change in the independent variable, holding the other independent variables constant
beta coefficient	Standardized regression coefficient, which measures how many standard deviations a dependent variable will change, per standard deviation increase in the independent variable
Hausman's endogeneity test	Test on simultaneity (i.e. test on reverse causation from dependent variable on independent variable)
Structural equation modeling (SEM)	The statistical method in which a hypothesized model is tested in a simultaneous analysis of the entire system of variables to determine the extent to which it is consistent with the data

A simple starting point for analysis of the relationship between various variables is to cross table the outcomes of two variables that one assumes to be interdependent. This kind of tables may provide one with an indication that variable A is related to variable B. A first econometric test to

test whether this relationship is statistically significant is a bivariate correlation analysis.[21] The correlation coefficient measures the strength of (linear) association between A and B. The statistical significance is indicated by the p-value. The p-value is the probability of obtaining a correlation coefficient at least as extreme as the one that was actually observed, assuming that the null hypothesis that there is no relationship between A and B is true. Traditionally, one rejects the null hypothesis if the p-value is less than or equal to the significance level. Normally, a significance level of 0.05 is used, a less stringent cut off value is 0.10 whereas 0.01 is seen as very stringent. Assuming a significance level p=0.05, a bivariate correlation coefficient between A and B with p-value less than 0.05 would result in the rejection of the null hypothesis at the 5% (significance) level that A and B are not correlated.

If one analyses many of such relations of the same kind, one could research whether the individual variables cohere and form a factor. Factor analysis is a statistical method used to describe variability among observed, correlated variables in terms of a potentially lower number of unobserved variables called factors. In other words, it is possible, for example, that variations in three or four observed variables mainly reflect the variations in fewer unobserved variables. The observed variables are modeled as linear combinations of the potential factors, plus "error" terms. The information gained about the interdependencies between observed variables can be used later to reduce the set of variables in a dataset.

There are two ways of factor analyses, explorative and confirmatory, and in our study we mostly use the confirmatory analysis (CFA)[22]. CFA allows the researcher to test the hypothesis that a relationship between the observed variables and their underlying latent construct(s) exists. The researcher uses knowledge of the theory, empirical research, or both, postulates the relationship pattern a priori and then tests the hypothesis statistically. In contrast, the goal of explorative factor analysis (EFA) is to identify factors based on data and to maximize the amount of variance explained. The researcher is not required to have any specific hypotheses about how many factors will emerge, and what items or variables these factors will comprise. Dependent on the characteristics of the variables, one can use various techniques for EFA.[23]

After bivariate correlation analysis and factor analysis, one can use linear multiple regression analysis for further analysis.[24] Regression analysis is concerned with the study of the dependence of one variable, the dependent variable (Y), on one or more other variables, the explanatory or independent variables (X_i).

$$Y = \delta_0 + \delta_1 X_1 + \delta_2 X_2 + \delta_3 X_3 + \ldots. + u$$

u denotes the error term that represents all those variables that affect Y but are not taken into account explicitly. The multiple regression equation gives the expected value of the dependent variable conditional upon the given values of the independent variables. The R^2 measures the strength of the relationship between the independent and dependent variables. The F test measures the joint significance of the independent variables, whereas the t-statistic (or p-value) evaluates the relationship between the dependent variable and each independent variable as measured by its partial regression coefficient (δ_i). The partial regression coefficients measure the change in the expected value of the dependent variable per unit change in the independent variable, holding the other independent variables constant. A standardized expression of the regression coefficient is the beta coefficient, which measures how many standard deviations a dependent variable will change, per standard deviation increase in the independent variable. In

multiple regression analysis, one should also control for controlling variables, otherwise the estimated effect of the independent variable on the dependent variables may be distorted. By adding control variables in the multiple regression analysis, one can isolate the true relationship between the dependent and the independent variables.

Although regression analysis estimates the dependence of one variable on other variables, it does not necessarily imply causation, because there may be reverse causation (creating simultaneity bias in the estimated regression coefficients) or spurious relation. Whether we may assume causation depends, ultimately, on theory. Using theory, one can, however, use several techniques to test for causation. In this chapter we will, for example, employ the Hausman endogeneity test. Another method to reduce simultaneity bias is to employ lagged observations (Waddock and Graves, 1997), which we will use in chapter 6.

If we research multiple dependent variables, we can use structural equation modeling (SEM) that estimates the network of relations. This technique enables one to take into account the covariations between various dependent and independent variables and test the nomological validity of the whole network of relations. In SEM one tests whether the covariance matrix implied by the researchers model sufficiently resembles the sample covariance matrix.

5.2.2 Strengths and limitations of econometric analysis

Using econometrics to research phenomena has strengths, but also limitations. The main strength of econometric analysis is its quantitative nature, which implies that the research can be well controlled and executed on a very large scale. As long as data is available, it is possible to research relationships between variables by controlling for other variables that are supposed to interferer a specific relationship. Structural equation modeling makes it even possible to research a network of relationships and therefore to present a coherent picture of all relationships at once. Also the accompanying transparency of this methodology contributes to the objectivity of the results. The quantitative nature of econometrics, however, is at the same time a limitation. First, one can doubt whether the measurement of the concepts at hand is always precise enough. Second, knowing the relevant relationships and their structure does not mean that we also understand the underlying mechanisms. For these to understand, other empirical methods like case studies are more appropriate. Case studies can go deeper than econometric analysis, but with the limitation that they necessarily have a much smaller scale and are less objective.

5.3 Drivers of CSR for large companies

In this section we present the outcomes of the econometric analysis of the drivers for large companies. First we discuss the data and some econometric methodological issues. Second, the results of bivariate regression analysis are reported, which gives a first indication of relationships between various drivers and CSR. Third, we employ confirmatory analysis to reduce the set of variables in a dataset. Fourth, we perform multiple regression analysis to test the various relationships hypothesized in the conceptual framework. Based on the results of the multiple regression analysis, we estimate a structural equation model for further confirmation of the findings of the multivariate regression analysis. The section is closed with a discussion of the results of the econometric analysis.

5.3.1 Data and methodological issues

For the econometric analysis of the drivers of CSR for large companies, we used the survey for large companies to obtain information on the drivers of CSR. CSR ratings were taken from Sustainalytics. Besides the data from the survey and from Sustainalytics, we used data from Sustainalytics regarding ESG rating, sector and country and Capital IQ for data on size and financial resources.[25] Since the data for drivers of CSR and the data for CSR ratings are based on various different sources, this will prevent common source bias.

Since the CSR and CSR motivations of any individual firm will not inversely affect the background institutions and the intermediate structures of market responsiveness and self regulation of industrial organizations, simultaneity may only occur at the level of the individual companies. In the theoretical framework, there are three possible reverse causal effects at this level. First, experience with CSR may inversely enforce strategic or intrinsic motivation. Second, CSR motivation may affect the business culture. For example, Berger et al. (2007) note that there is a highly interactive process between organizational culture and CSR. CSR sympathetic cultures will attract workers with an affinity for CSR, who then perpetuate the CSR sympathetic culture. This causes a reinforcing cycle between culture and CSR motivation. Third, CSR may also increase financial resources of the company.

5.3.2 Bivariate correlation analysis

The results of Table 5.2 show that the positive relationships between the drivers and CSR performance are confirmed by a bivariate correlation analysis for many variables. This provides us with a first indication of the relevance of these drivers.

Analysing the results in more detail, the relationship between CSR motivation and CSR performance is only confirmed for strategic motivation regarding the influence of CSR on long term profitability, reputation and innovation. For legal and intrinsic motivation, no significance relationship with CSR performance is detected. For internal business environment, we find a significant positive relationship between CSR and CSR time horizon and with size, but not for business culture. For the external business environment, only information provided by industrial associations is significantly positively related to CSR. The CSR responses of internal and external stakeholders are significantly related to CSR, except for the product market (p=0.08). For the background institutions, we find empirical indication of a positive relationship with CSR performance for all variables, except for the degree of price competition. For the control variables, the company's position in the chain and the degree of internationalization and financial return are not related to CSR, whereas for market position, sector and region only a subset of dummies is significantly related to CSR performance. Furthermore, CSR is strongly positively related to company size.

Table 5.2 Bivariate correlation coefficients between CSR drivers and CSR performance for large companies[a]

Motivation		Control variables	
Strategic motivation	.35	Market leader	.16
Legal motivation		Following market leader	
Intrinsic motivation		Level-playing field	-.24
Internal business environment		Niche supplier	

(Open Systems) Business culture		Business to consumers	
Time horizon	.19	Outsource dev. countries	
External business environment		Financial return	
CSR info industrial organizations	.16	Anglo Saxon non-EU	-.19
CSR info business schools		Anglo Saxon EU	
Internal and external stakeholders		Scandinavia	
Internal stakeholders	.14	Mediterranean Europe	.24
Capital market	.19	Continental Europe	
Product market		Asia	-.17
Labour market	.26	Energy	.28
Background institutions		Material	
Price competition		Industry	
Quality competition	.21	Consumer	-.15
Reporting mandatory	.25	Health	
Monitoring NGOs and media	.35	IT & communication	
Control variables		Finance	-.14
Size	.33		

[a] Spearman's rho. Only coefficients that are significant at the 0.05 level are reported.

5.3.3 Confirmatory factor analysis

We performed confirmatory factor analysis on subsets of variables that can theoretically be grouped in factors. Only for the subset of variables comprising internal and external stakeholder responses on capital, product and labour market we found a Cronbach alpha of 0.78, which well exceeds the lower limit of 0.60 (Hair et al, 1998). For this reason, we aggregated the internal and external stakeholder responses on capital, product and labour market into a new variable 'stakeholder responsiveness'.

5.3.4 Multiple regression analysis

Although the bivariate correlation analysis presents a first indication which factors may drive CSR performance, we need a more thorough analysis to test the robustness of these findings in a more integrated framework. First, as indicated by the conceptual framework of Figure 5.2, some variables (that are insignificant in Table 5.2) may affect CSR performance indirectly through other variables. Furthermore, other variables that are significantly related to CSR performance in Table 5.2, may correlate with other independent variables. Controlling for these other variables may show that the relationship is not robust but due to other

Table 5.3 Multiple regression analysis for large companies[a]

	(1)	(2)	(3)	(4)	(5)
	CSR	**Strategic motive**	**Business culture**	**Info industrial associations**	**Stakeholder responsiveness**
CSR motivation					
Strategic motive	.22*				
Legal motive	.06				
Intrinsic motive	.16				
Internal business environment					
Business culture	-.09	.12*			
Time Horizon	.10*	.00			
External business environment					
Info industry	-.02	.15**			

associations					
Info business schools	-.11	.01			
Stakeholder responsiveness	-.08	.30***	.02	.23***	
Background institutions					
Mandatory reporting	.12*	.15**	.04	.08	.26***
NGOs & media	.10	.07	-.05	.14*	.10
Price competition	-.07	.06	.00	.05	.12*
Technological competition	.17**	.14*	.20**	.05	.19**
Control variables					
Size	.38***	-.02	.02	-.06	.06
Market leader	.22	.39**	.07	.09	.27*
Follower	.24*	.31**	.01	.13	.19
Level playing field	.05	.28***	.05	.16	.12
B2C	.04	-.06	.16*	.21***	-.03
Internationalization	.01	-.04	.11	-.13*	-.02
Financial return	.05	-.01	.03	.02	-.05
Anglo Saxon non-EU	.14	.06	.12	.07	-.17
Anglo Saxon EU	.07	.02	.01	.17*	-.14*
Scandinavia	.21**	-.04	.18*	.06	-.15*
Mediterranean Europe	.24**	.13	.02	.09	.12
Continental Europe	.18*	.09	-.01	.11	-.24**
Energy	.31***	.03	.04	.01	.01
Material	.27***	.01	.14	.11	.12
Industry	.23***	.00	.18*	.09	.14*
Consumer	.07	-.02	.06	-.04	.02
Health	.12	-.07	.09	-.15*	.07
IT&comm	.17**	-.00	.12	.08	.06
R2	0.46	0.46	0.16	0.28	0.34
F	4.90***	5.58***	1.44*	2.98***	4.21***

[a] Beta coefficients; * p<0.10; ** p<0.05; *** p<0.01

(compositional) effects. This section therefore proceeds with multiple regression analysis based on the conceptual framework outlined above. The estimation results are reported in Table 5.3.

The first column presents the estimation results for CSR performance. The first column shows that for motives, only the strategic motive is significantly positively related to CSR. Although the signs of the legal and intrinsic motives are positive, the relationships are insignificant as the p-value is larger than 0.10. In the theoretical framework we assume that internal and external business environment and background institutions affect CSR only indirectly through CSR motivation and not directly. The estimation results show that in most cases these hypotheses are confirmed. Only for time horizon, mandatory reporting and technological competition we find a significant direct effect on CSR. This indicates that the influences of time horizon, mandatory reporting and technological competition on CSR are not fully mediated by CSR motivations. Furthermore, CSR is dependent on company size, sector (with the financial sector as reference sector), the market position of the company (with companies in a niche market as reference) and the region (with Asia as reference). No significant relationships are found between CSR and position in the chain, internationalization and financial return.

Since only strategic motivation is significantly related to CSR, we next investigated the relationship between strategic motivation, the internal business environment, industrial

organizations and business schools, stakeholder responsiveness and background institutions, again correcting for the various control variables.[26] The estimation results are presented in the second column of Table 5.3. The estimation results show that companies with an open systems culture are more strategically motivated to CSR. Also information provided by industrial associations and the market responsive of stakeholders on the capital, product and labour market foster strategic motivation. Furthermore, strategic motivation is significantly positively related to the degree that the company is subject to mandatory reporting and the intensity of technological competition. For the control variables, only the market position is significantly related to strategic motivation, market leaders being most strategically motivated to CSR.

Based on the estimation results in column (1) and (2), we further investigated the influence of background institutions on the factors that show a significant relationship with CSR and/or strategic motivation: business culture, the role of industrial organizations and the stakeholder responsiveness, again controlling for the various control variables.[27] The estimation results in column (3) show that business culture is significantly positively related to technological competition. Column (4) shows that the involvement of industrial associations with CSR is stimulated by the pressure from the stakeholder responsiveness to CSR on capital, product and labour markets as well as by the pressure from NGOs and media. Column (5) shows that the stakeholder responsiveness on capital, product and labour markets is stimulated by transparency caused by mandatory reporting as well as by price and technological competition.

5.3.5 Tests on simultaneity

Since the CSR performance and CSR motivations of any individual company will not inversely affect the background conditions and the intermediate conditions of market responsiveness and self regulation of industrial organizations, simultaneity may only occur at the level of the individual companies. In the theoretical framework, two possible reverse causal effect concerns the relationship between CSR performance and business culture and between CSR performance and strategic CSR motivation. Furthermore, CSR performance may also increase financial resources of the company. In order to reduce the possibility of reverse causation from CSR performance on financial performance, we used lagged values for financial performance, which is a common strategy in the CSR literature (Waddock & Graves, 1997). In order to identify potential simultaneity between strategic CSR motivation and business culture and CSR performance and strategic CSR motivation, we employ the Hausman test of endogeneity (also known as Hausman specification error test).[28] The test results show no indication of reverse causation from CSR motivation on business culture or from CSR performance on strategic motivation. Based on these results, we conclude that the causality runs from business culture on strategic CSR motivation and from strategic CSR motivation on CSR.

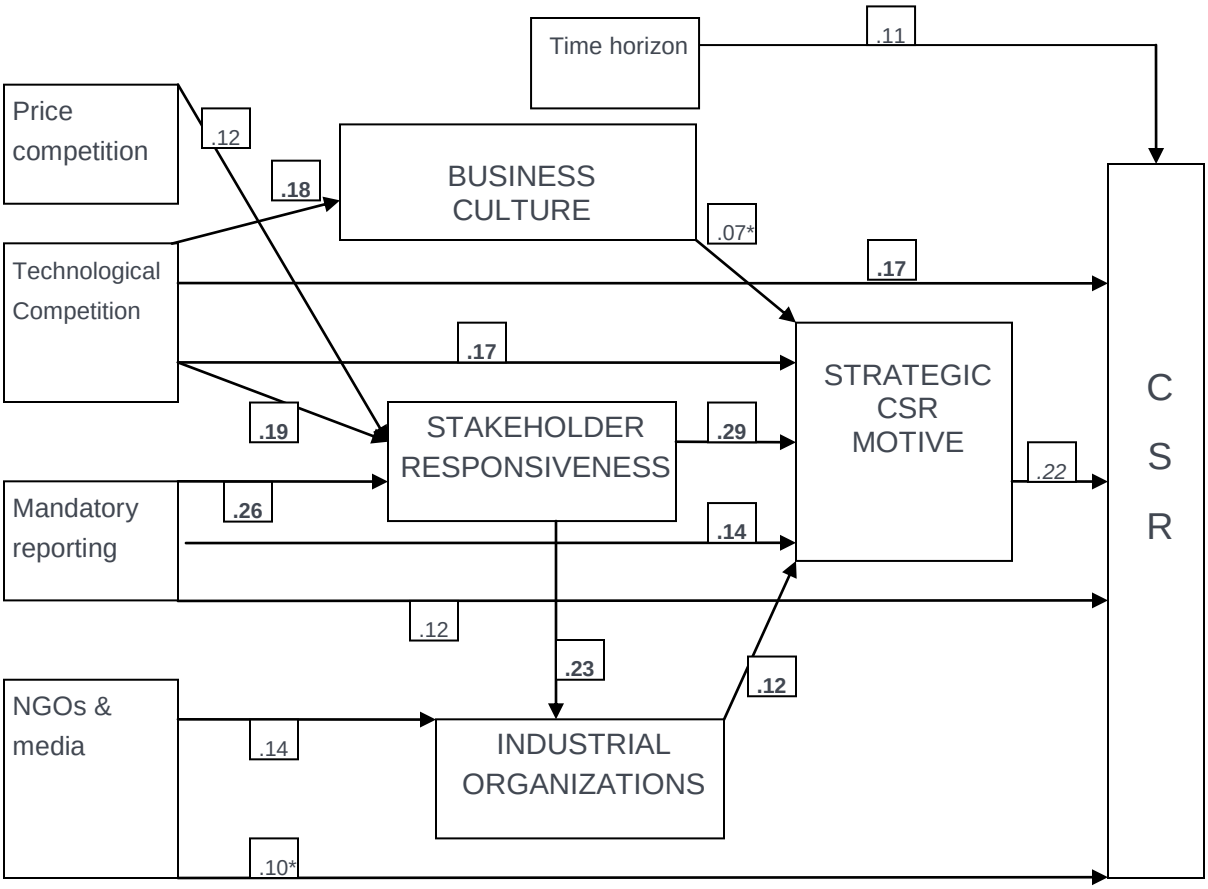
5.3.6 Structural equation model (SEM)

In order to test the full structure of the model more efficiently, we use structural equation modeling to test the equations reported in Table 5.3 simultaneously. The details of the estimation methodology and results are reported in Appendix 2. Figure 5.2 depicts the main relations of interest which we found when estimating all the relationships depicted in figure 5.1 simultaneously.

Most relationships that are significant in the regression analysis are also significant when they are estimated simultaneously. For some variables, such as the influence of monitoring by NGOs and

media on CSR and the influence of business culture on strategic motivation, the p-value is just above the threshold of 0.10, but these influences are supposed to be still relevant. Overall the structural equation model confirms the pattern and relationships that we found in the multiple regression analyses.

Figure 5.2 Structural equation model for drivers large companies[a]



[a] Standardized coefficients; bold: p<.01; italics: p<.05; normal: p<.10, *: p>.10.

5.3.7 Discussion

In our model we simultaneously tested the multilayered framework depicted in figure 5.1 of drivers of CSR by distinguishing CSR motivation, internal business environment, industrial self regulation, stakeholder CSR responsiveness of capital, product and labour markets and background institutions. Only for 4 out of 21 explanatory variables distinguished in our model framework, we could not find empirical confirmation of a direct or indirect relationship with CSR.[29]

For motivations, we find that both financial strategic motivation and intrinsic motivation drive CSR. The regulation motive appears insignificant. In our research, we find that the strategic motivation is more important than intrinsic motivation. This finding contrasts with Graafland and van de Ven (2006) and Graafland et al (2012). For a sample that consists mainly of SMEs Graafland and Van de Ven (2006) find CSR is significantly related to intrinsic motives, but no significant relation is detected between CSR and the financial strategic motive. Also Graafland et al (2012) find that, for a sample that mainly consists of SMEs, intrinsic motives provide stronger stimulus for CSR than

financial-strategic motives. In contrast, Brønn and Vidaver-Cohen (2009) find that the company's long-term interest and image feature among the most frequently reasons for CSR. However, intrinsic motives also ranked highly, such as be recognized for moral leadership (second rank) and personal satisfaction (fourth rank). Furthermore, for a sample of large companies Lougee and Wallace (2008) indicate that companies use CSR mainly as a form of "risk management". An explanation for this diverge in findings is that, like Brønn and Vidaver-Cohen (2009) and Lougee and Wallace (2008), our sample covers large companies rather than individual persons in companies or small companies as in Graafland and van de Ven (2006) and Graafland et al (2012) for which intrinsic drivers may be important.

The strategic motivation appears of crucial importance for the pattern of influences of several other factors driving CSR. It mediates the influences of business culture, industrial self regulation and the responsiveness of stakeholders on capital, product and labour markets. The reason why companies with an open systems culture are more strategically motivated to CSR may be that they place greater emphasis on innovation (Linnenluecke and Griffiths, 2010) which is one of the motives in the strategic motive factor. Several studies have shown that CSR is positively correlated with innovation (Padgett and Gallan, 2009; McWilliams and Siegel, 2000). For example, empirical evidence suggests that general innovation can have a positive impact on the adoption of voluntary environmental programs (Ziegler and Nogareda, 2009). The reason is that innovative firms are already engaged in improving production processes and products and therefore have overcome management barriers such as the lack of finance or know-how such that they are more likely to be capable of undertaking organizational changes and absorbing new costs (Ziegler and Nogareda, 2009:887). There are also bidirectional causal links from CSR on innovation (Carrion-Floresa and Innesb, 2010). For example, EMS systems enable the development of strategic resources which can have a positive impact on innovation abilities in general and thus also on technological environmental innovations (Wagner, 2007; Frondel, Horbach, and Rennings, 2007). While the literature cited above leaves the causality of the link between technical and organisational innovation open, Horbach (2008) found evidence on the basis of panel data which clearly indicates an impact of organisational environmental innovation (environmental management systems) on technical environmental innovation.

CSR information by industrial associations also stimulates CSR indirectly by enforcing CSR motivation. This indicates that the type of information industrial associations provide make companies more aware of the strategic effects that CSR has on their profitability, reputation and innovation. Hence, the most important role of these institutes seems to be stimulating awareness and not so much providing tools or instruments that companies can use to integrate CSR in their operations. Because then we would have expected a direct effect on CSR as well, independent from the motivational effect. For business schools we find no significant relationship with CSR or CSR motivation. This indicates that business schools hardly play a role in fostering CSR.

Besides business culture and industrial self regulation, also the influence of stakeholder responsiveness to CSR on capital, product and labour markets is mediated through strategic CSR motivation. This shows that once companies perceive that capital costs and labour turnover will decline and access to capital, product margins, turnover, and motivation of employees increase with CSR, this provides them with a strong strategic motivation to integrate CSR in their strategy and policies. Furthermore, the CSR pressure from stakeholders on capital, product and labour markets influences strategic CSR motivation indirectly by eliciting industrial self regulation

of CSR. This confirms our hypothesis that under pressure from market forces, industrial organizations may realize that coordination of responses to CSR trends may provide an important service to their members and start initiatives to collect best practices and inform members that are not yet fully aware of the threats or opportunities posed by the CSR trends that are evolving in the market place.

We did not detect an influence of time horizon on strategic motivation. Instead, we find a direct and significant positive relationship between time horizon and CSR, which is not mediated by CSR motivation. Although this confirms that companies with a long time horizon will be more prepared to invest in patterns of CSR of which the short term benefits are uncertain, it is difficult to understand why this influence is independent from CSR motivation.

For the background institutions, we find several direct and indirect relationships with CSR. For competition, our research shows that it is important to make a distinction between price competition and technological competition. Whereas price competition affects CSR indirectly by stimulating the CSR market response of stakeholders, technological competition exerts both a direct positive effect on CSR as well as several indirect effects through strategic motivation, open systems business culture and stakeholder response. The relationships between technological competition with business culture, strategic motivation and CSR stakeholder response confirm the importance of the innovation potential of CSR discussed above. But it also shows the importance of the reputation mechanism. If companies face technological rather than price competition, the branding of their products will be of critical value and this creates an important motive for upholding a good CSR reputation. Finally, we also tested for a non-linear influence of price competition on CSR, but no significant effect was found. Therefore, we could not confirm the proposition of Campbell (2007) that an increase in competitiveness stimulates CSR in weak competitive markets, but discourages CSR in markets with fierce competition.

Government regulation of CSR through mandatory reporting affects CSR directly as well as indirectly by fostering CSR motivation and market responsiveness of stakeholders. Companies that are subject to more transparency perceive a stronger reputation motive and this motivates them to a more active CSR policy. By making information on CSR more transparent, rating bureaus will have more access to information on CSR. This will foster self-regulation by market participants, analogues to the effect of corporate financial disclosure in the past (Fung et al., 2006). The rise of the financial reporting system was not a fully autonomous process. The American government played a major role by setting up a basic reporting framework in 1933–1934. This extended the scope and reliability of the information collected by rating bureaus considerably and consolidated their position as a vital player in corporate financial reporting. Likewise, a basic legal framework in CSR reporting will foster self-regulation in CSR (Dubbink et al., 2008).

For monitoring by NGOs and media, we find direct effects on CSR as well as indirect effects through industrial self regulation. Like mandatory reporting, active monitoring by NGOs and media enforces the reputation mechanism by making company operations more transparent. The tactics of NGOs and social movement organizations may vary from appealing directly to the corporations, organizing demonstrations, pressuring local governments and mobilizing media campaigns. Also the press may independently operate as a watchdog of the company's social responsibility. That the media and NGOs really have an impact on the actions of a company is also highlighted by various cases, like the Kenosha case of Chrysler, the Brent Spar case of

Shell, the Dolphin-Tuna case or the construction fraud in the Netherlands (McMahon, 1999; Grolin, 1998; Wright, 2000; Graafland, 2004).

Finally, we find several effects of control variables. First, CSR is strongly related to company size. Although all companies in our sample are large, we still find that size has a substantial effect on CSR. This shows that the relationship between CSR and company size even holds within a group of large companies. Also market leadership encourages engagement in CSR. The estimation results show that companies with a market leadership position pursue a more active CSR policy, both by a direct effect on CSR as well as by an indirect effect through the mediation by the strategic motivation. We also find that companies following the market leader are actively engaged with CSR. This may indicate that companies following the market leader are using CSR as a strategic means to improve their competitive position with regard to the market leader. Next, the position in the chain affects CSR only indirectly through business culture and industrial self regulation. We also find some indirect but opposite effects of the degree of internationalization on stakeholder responsiveness and information provided by industrial organizations; therefore, the net effect of internationalization is nihil. A possible explanation is that outsourcing measures only one, albeit a crucial, element of internationalization. Companies that have own establishments in developing countries are not covered by this measure, whereas they may also have a higher need for an active CSR policy because of high reputational risks from their operations in their developing countries. Furthermore, we could not confirm a positive direct or indirect relationship between financial resources and CSR. Still, we do find a small positive coefficient (see the multiple regression analysis), so we cannot falsify the slack resource effect as well. Furthermore, we find that companies from European countries with a fairly large welfare state outperform companies from Asia and from Anglo Saxon countries within or outside the EU with a smaller welfare state. The interpretation of this result is complicated, because the regional dummies may capture several different types of influences, such as culture and general government regulation. Moreover, some of the ESG indicators used by Sustainalytics may directly or indirectly reflect the influence of government regulation and therefore indicate implicit rather than explicit CSR. Nevertheless, our results do provide an indication that the larger potential for CSR in Anglo Saxon capitalism is not confirmed. Rather the opposite seems true. This may be due to the broader orientation than on shareholder value only in Western European countries. But it may also be due to the fact that government regulation stimulates rather than crowds out the inclination of companies to take responsibility for social and environmental value creation and society's welfare by signalling the high priority that social and environmental issues receive in society and the democratic support for them. Finally, CSR is dependent on the sector in which the company operates. In particular, we detect a direct relationship between CSR and the energy, material, industry and IT sector.

5.4 Drivers of CSR for SMEs

In this section we present the outcomes of the econometric analysis of the drivers for SMEs. The structure of the section is similar to section 5.3 and contains a description of the data, bivariate regression analysis, confirmatory factor analysis, multiple regression analysis, structural equation model and a discussion of the results of the econometric analysis.

5.4.1 Data

For the econometric analysis of the drivers of CSR for SMEs, we used the survey for SMEs to obtain information on the drivers of CSR and on CSR performance.[30] The index of CSR performance was calculated as the average of seven sub indicators measuring the use of CSR instruments, the issue specific efforts that companies undertake to improve social and environmental aspects of CSR, measurement, use of targets and reporting of these aspects and the respective outcomes measured by the changes between 2007 and 2010. The definitions of the overall CSR performance index and sub indicators are reported in Table 5.4.

Table 5.4 Construction of CSR performance (sub)indices[a]

Index	Unweighted average of scores on:
CSR instruments	internal code, external code, dialogue with NGOs, cooperation in supply chain, partnerships, participation in local initiatives, director is answerable, CSR related remuneration, confidential person, ethics committee, CSR training, reference guide, membership global initiatives, ISO9001, ISO14001, SA8000, Other certifications
Social effort	Effort on: women in board, recruitment disadvantaged, work life balance, employee training, work accidents, working conditions suppliers
Environmental effort	Effort on: CO2 emission, energy consumption, water consumption, waste production, environmental conditions suppliers
Social measurement, targeting& reporting	Measuring, targeting and reporting on: women in board, recruitment disadvantaged, work balance, employee training, work accidents, working conditions suppliers
Environmental measurement, targeting& reporting	Measuring, targeting and reporting on: CO2 emission, energy consumption, water consumption, waste production, environmental conditions suppliers
Social outcome	Change in: women in board (+), recruitment disadvantaged (+), overtime hours (-), collective bargaining (+), permanent contracts (+), work accidents (-)
Environmental outcome	Change in: CO2 emission (-), energy consumption (-), use of renewable energy (+), water consumption (-), waste production (-), recycling of waste (+)
Overall CSR performance	CSR instruments, Social effort, Environmental effort, Social measurement, targeting & reporting, Environmental measurement, targeting & reporting, Social outcome, Environmental outcome

[a] All sub indices are scaled to the range from 0 (lowest value) to 1 (highest value). For a description of all variables, see also Chapter 3.

5.4.2 Bivariate correlation analysis

Table 5.5 reports the results of the bivariate correlation analysis for SMEs.

Table 5.5 Bivariate correlation coefficients drivers and CSR performance for SMEs[a]

Motivation		Control variables	
Strategic motivation	.38	Level-playing field	-.06
Legal motivation	.29	Niche supplier	-.08
Intrinsic motivation	.38	Business to consumers	.07
Internal business environment		Anglo Saxon EU	.05
(Open Systems) Business culture	.08	East Europe	
Time horizon	.17	Scandinavia	-.08
Internal and external stakeholders		Mediterranean Europe	
Internal stakeholders	.32	Continental Europe	.07
Capital market	.23	Agriculture	
Product market	.28	Mining	
Labour market	.31	Food	.06
External business environment		Textile	-.03
CSR info industrial organizations	.29	Paper	
Background institutions		Oil & chemical	.06
Price competition		Metal	
Quality competition	.11	Machine	-.05
Monitoring NGOs and media	.29	Transport	
Control variables		Other manufacturing	
Size	.38	Elect, gas & water	.07
aged < 25 y	.20	Construction	
aged 25-50 y	-.04	Trade & hotels	-.05
Aged > 50 y		Transport services	.05
Low skilled	.08	Telecommunications	-.04
Medium skilled		Finance	
High skilled	.09	Real estate	
Market leader	.14	Other services	-.03
Following market leader	.06	Other business	

[a] Spearman's rho. Only coefficients that are significant at the p=0.05 level are reported.

Again we find a significant positive relationship between CSR performance and strategic motivation, time horizon, CSR info provided by industrial associations, internal stakeholders response, capital and labour market response, technological competitiveness, monitoring by NGOs or media, size, and following of market leader. Furthermore, we also find a significant relationship between CSR performance and legal motivation, intrinsic motivation, business culture, product market response, age division, skill level, market leadership, level playing field (negative) and niche suppliers (negative). Only for price competitiveness, we find no significant relationship with CSR performance. Finally, we find some evidence of sectoral and regional differences.

5.4.3 Confirmatory factor analysis

Just as for large companies, we performed confirmatory factor analysis on internal and external stakeholder responses on the capital, product and labour market. We found a Cronbach alpha of 0.85, confirming that these variables can be reduced to one factor 'stakeholder responsiveness'.

5.4.4 Multiple regression analysis

Table 5.6 reports the results of the multiple regression analysis.[31] The first column presents the regression results for CSR performance. For most variables, we find similar results as found by the bivariate correlation analysis, except for the legal motive, skill level and market position (except market leadership) which become insignificant. Furthermore, the coefficient for regional dummy for continental Europe changes from positive to negative.

Table 5.6 Multiple regression analysis for SMEs[a]

	(1)	(2)	(3)	(4)	(5)	(6)
	CSR	Strategic motivation	Intrinsic motivation	Business culture	Info industrial associations	Stakeholder responsiveness
CSR motivation						
Strategic motivation	.08***					
Legal motivation	.03*					
Intrinsic motivation	.23***					
Internal business environment						
Business culture	.03**	.08***	.20***			
Time Horizon	.08***	.02*	.03**			
External business environment & stakeholder response						
Info industry associations	.06***	.08***	.08***			
Stakeholder responsiveness	.03	.65***	.35***	.13***	.13***	
Background institutions						
NGOs & media	.09***	.05***	.08***	.03*	.41***	.29***
Price competition	.01	.01	.01	-.01	.05***	-.01
Technological competition	.03**	.04***	.05***	.10***	.01	.10***
Control variables						
Size	.31***	.05***	.01	-.13***	.10***	.09***
Age<25Y	.05***	.00	.04**	-.01	-.03**	.03**
Age 25-50Y	.01	.01	.03*	.01	-.02	.03*
Medium skilled	.01	.01	.01	.06***	-.01	.02
High skilled	.01	.00	.05***	.10***	-.02	.08***
Market leader	.05***	.00	.03	-.06***	.00	.07***
Follower	.00	-.01	-.02	-.04**	.02	.06***
Level playing field	-.00	-.02	-.02	-.08***	-.00	.04**
B2C	.02*	-.01	.02	.01	-.01	.02
Anglo Saxon EU	.03**	.06***	-.05***	.03*	.05***	.04***
Scandinavia	-.10***	.02	-.03	.00	.09***	.18***

Mediterranean Europe	.00	.06***	.01	-.01	.07***	.19***
Continental Europe	-.08***	.06***	-.04*	-.03	.19***	.21***
Agriculture	.01	.00	-.01	-.02	.02	.02
Mining	.01	.01	-.02	-.01	.02**	.00
Food	.03**	-.01	-.03*	-.03**	.01	.03**
Textile	-.00	-.01	-.01	.01	.04***	-.01
Paper	.04***	-.01	-.00	-.01	.02	.01
Oil & Chemical	.04***	.01	.01	.01	.04***	.02
Metal	.03*	-.02	-.01	-.02	.04***	.01
Machine	-.01	-.02*	-.03	.01	.03**	.02
Transport	.02	.00	-.03**	-.01	.00	-.01
Other manufacturing	.04***	-.00	-.01	-.02	.01	.02
Electricity, gas & water	.02*	.00	.02	.03*	.03**	.01
Construction	.03*	-.01	-.03*	.00	.05***	.02
Trade & hotels	-.01	-.00	.01	.01	-.00	.02
Transport services	.02	.02*	.00	.00	.02*	-.00
Telecommunications	-.03*	-.01	-.01	.04***	-.03**	.01
Finance	-.02	-.02	-.01	.00	.01	-.02*
Real estate	-.00	-.00	.01	-.01	.02	.02
Other services	-.01	-.02	.03	.03*	-.01	-.03*
R^2	0.34	0.53	0.26	0.07	0.30	0.15
F	55.3***	132.8***	41.4***	12.1***	62.9***	28.0***

[a] Beta coefficients; * p<0.10; ** p<0.05; *** p<0.01. Number of companies: 4500.

We next investigated the relationship between strategic motivation, the business culture, info from industrial organizations and stakeholder responsiveness with background institutions, again correcting for the various control variables. The estimation results for strategic motivation in column (2) confirm that companies with an open systems culture are more strategically motivated to CSR. We now also find a small positive effect from time horizon on strategic motivation. Furthermore, information provided by industrial associations and the market responsive of stakeholders on the capital, product and labour market as well as the intensity of technological competition foster strategic motivation. The estimation results in column (4) show again that business culture is significantly positively related to technological competition, but also stakeholder responsiveness is relevant. Column (5) shows that the involvement of industrial associations with CSR is very dependent on the pressure from NGOs and media. Also the stakeholders' responsiveness is fostered by transparency created by monitoring activities of NGOs and media (column 6).

As intrinsic motivation appears an important explanatory variable in the model for SMEs, we also performed multiple regression analysis for intrinsic motivation. In contrast to large companies, we find that intrinsic motivation is strongly related to various explanatory variables. First, intrinsic motivation depends positively on business culture, indicating that companies with a flexible management structure and external orientation are more intrinsically motivated to CSR. Also time

horizon is positively related to intrinsic motivation, which is plausible as companies that have a long time horizon may also become more aware of their responsibility towards future generations. Remarkably, we also find a significant positive relationship between stakeholders' responsiveness and intrinsic motivation. More detailed tests shows that intrinsic motivation is particularly linked to the effect of CSR on employee motivation. This may indicate that if employees are sensitive to CSR issues, they will experience personal satisfaction from the company's CSR. Besides, highly motivated employees may influence and convince the management of the company of the intrinsic value of CSR. Furthermore, information of industrial organization and societal pressure by NGOs and media do not only fuel strategic CSR motivation, but also make SMEs more aware of the responsibility that they have towards society. We also find a significant effect of technological competition on intrinsic motivation. This may indicate crowding in effects. This means that if companies pay serious attention to CSR because of extrinsic motivations, they become more known with CSR and this may stimulate their intrinsic motivations as well. Finally, we find some influences of control variables. For example, companies with relative young and high skilled employees tend to be more and companies in UK and in food, transport and construction sector appear to be less intrinsically motivated to CSR than other companies.

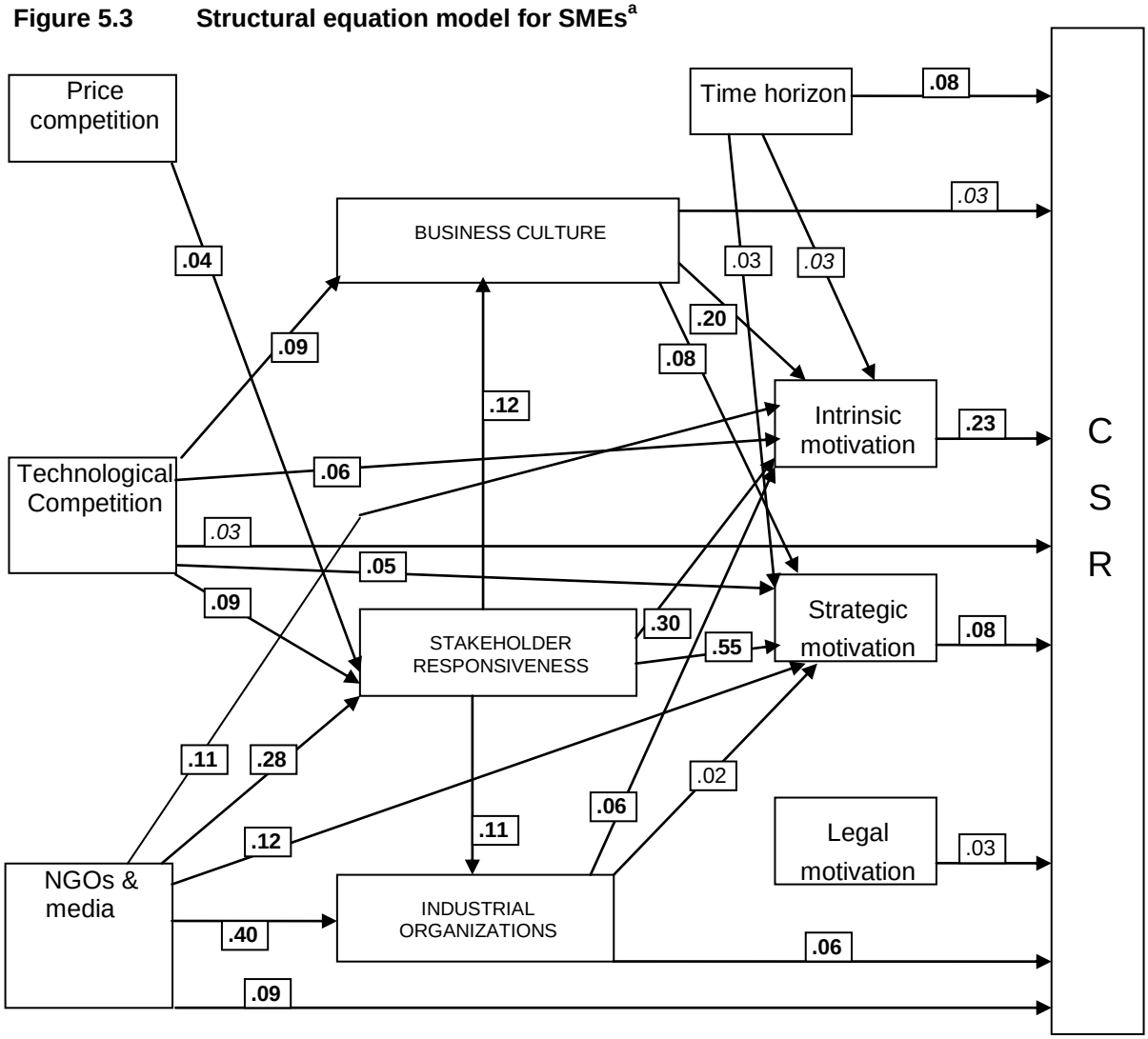
5.4.5 Tests on simultaneity

In order to identify potential simultaneity between strategic and intrinsic CSR motivation and business culture and CSR performance and strategic CSR motivation, we again employ the Hausman endogeneity test.[32] The test results show no indication of reverse causation from CSR motivations on business culture or from CSR performance on strategic motivation or intrinsic motivation. Based on these results, we conclude that the causality runs from business culture on strategic and intrinsic CSR motivation and from strategic and intrinsic motivation on CSR performance.[33]

5.4.6 Structural equation model

In order to test the full structure of the model more efficiently, we use structural equation modeling to test the equations reported in Table 5.6 simultaneously. The detailed results are reported in Appendix 2, Figure 5.3 depicts the main relations of interest. Almost all relationships that are significant in the regression analysis are also significant when they are estimated simultaneously. Hence, the structural equation model confirms the pattern and relationships that we found in the multiple regression analyses.

Figure 5.3 Structural equation model for SMEs[a]



[a] Standardized coefficients; bold: p<.01; italics: p<.05; normal: p<.10.

5.4.7 Discussion

In this section, we compare the results of the analysis of drivers of CSR for SMEs with the findings in section 5.2. A general finding is that, just as for large companies, almost all explanatory variables distinguished in the operationalized framework significantly affect CSR, directly or indirectly. Given that these findings are confirmed for two different samples, based on different sources (namely ratings from Sustainalytics and survey data generated by the IMPACT project), we have obtained a very strong confirmation of the empirical validity of the model.

Still, we also find interesting differences for large companies and SMEs. First, we find that for SMEs intrinsic motivation is more important than strategic motivation. In this respect, SMEs clearly differ from large companies that are more driven by strategic motivation. This finding is in line with the contrasts in findings by Graafland and van de Ven (2006) and Graafland et al (2012) on the one hand and those of Brønn and Vidaver-Cohen (2009) and Lougee and Wallace (2008) hand. Because, as we noted earlier, the finding of Brønn and Vidaver-Cohen (2009) and Lougee and Wallace (2008) that strategic motivations are predominant is based on a sample that covers

large companies, whereas the finding of Graafland and van de Ven (2006) and Graafland et al (2012) that intrinsic drivers are more important is found a sample that includes many SMEs. For both samples we find that the legal motive is no substantial driver of CSR. We interpret this result as indicating that companies that are mostly legally motivated to CSR, will follow a more minimalist CSR policy.

Second, in contrast to large companies, we find that for SMEs not only strategic but also and intrinsic motivations mediate the influence of business culture, CSR info by industrial association and stakeholder response on CSR performance. Next, again in contrast to large companies, these variables also exert a (relatively small) direct influence on CSR performance of SMEs. This indicates that these underlying variables influence CSR for other reasons than strategic or intrinsic motivation. For example, as noted above, industrial associations may not only stimulating awareness of the strategic importance of CSR, but also provide tools that companies can use to integrate CSR in their operations and this will directly affect CSR performance.

Third, for SMEs we also detect an influence of time horizon on strategic and intrinsic motivations. One would indeed expect that companies with a long time horizon will be more strategically motivated to CSR, because the strategic benefits of CSR often need a long term for materializing in better reputation or innovative capacity. Furthermore, just as in the case of large companies, we also find a direct and significant positive relationship between time horizon and CSR, which is not mediated by CSR motivations.

Fourth, in contrast to large companies, technological competitiveness does not directly affect CSR performance, but only indirectly through strategic and intrinsic motivations, open systems business culture and stakeholder response. This may indicate that CSR related branding of products is more crucial for large companies than for SMEs.

Fifth, we find a remarkable difference for regional dummies. Whereas large companies in European countries with a fairly large welfare state outperform companies from Anglo Saxon countries within the EU, opposite effects are found for SMEs.[34] There may be various explanations for this finding. First, it should be noted that the set of countries covered by each region does not exactly match. For example, in the SME survey Mediterranean Europe consists of Italy (73%) and Spain (27%) whereas in the survey of large companies Mediterranean Europe consists of Italy (19%), Spain (52%), Portugal (13%) and Greece (16%). Hence, whereas in the SME survey Mediterranean Europe refers mostly to Italian companies, in the survey for large companies Italian companies are only a small minority. More importantly, the result seems to reflect a discrepancy in CSR between large companies and SMEs in Anglo Saxon countries compared to other European countries, in the sense that SMEs in Anglo Saxon countries are relatively more pro-actively fostering CSR than SMEs in other European countries. This is confirmed by the analysis of CSR performance of SMEs in chapter 3 which shows that the SMEs from UK outperforms other SMEs with respect to commitment and various kinds of outputs.[35]

Table 5.7 Reduced form coefficients[a]

	large	SMEs		large	SMEs
Business culture	0.02	0.08	Market leader	0.33	0.05
Time Horizon	0.11	0.09	Follower	0.33	0.00
Info industry associations	0.03	0.06	Level playing field	0.12	0.00
Stakeholder responsiveness	0.06	0.11	B2C	0.05	0.02
NGOs & media	0.10	0.18	Anglo Saxon EU	0.07	0.04
Price competition	0.01	0.01	Scandinavia	0.22	-0.07
Technological competition	0.22	0.06	Mediterranean Europe	0.27	0.05
Size	0.39	0.34	Continental Europe	0.18	-0.03

[a]Calculated by summing up direct effects and indirect effects.

Table 5.7 provides an overview of the sum total (reduced form) of direct and indirect effects of various drivers on CSR. The table confirms a high coincidence in findings. The largest differences are found for technological competitiveness and market leadership, which show a larger impact on CSR performance of large companies. Furthermore, as discussed above, we find important regional differences.

6 ECONOMETRIC ANALYSIS OF CSR PERFORMANCE

More and more companies nowadays employ various kinds of CSR policies and instruments, such as codes of conduct or ISO-certifications. Several studies have shown that CSR performance is positively related to the financial performance of companies (e.g. Beurden and Gössling, 2008; Margolis, Elfenbein and Walsh, 2007; McWilliams and Siegel, 2000; Orlitzsky, 2008; Orlitsky, Schmidt and Rynes, 2003; Waddock and Graves, 1997). The causation seems to be that CSR and financial performance mutually affect each other through a virtuous circle: financially successful companies spend more on CSR because they can afford it, but CSR also helps them to become more successful (Orlitzky, 2008; Waddock and Graves, 1997).[36]

But good financial performance of companies is just one of the three dimensions in which a socially responsible firm creates value. There are only a few studies that analyse how CSR policies and instruments affect the realization of social and environmental goals (CSR outcome). Most studies do not distinguish implementation from outcomes or impact. With respect to environmental outcomes, Friedman & Miles (2001) and Ammenberg & Hjelm (2003) looked at the outcomes of environmental management systems and found that the establishment of a joint environmental management system in Britain respectively Sweden resulted in environmental improvements. Because of this limited evidence, it remains uncertain to what extent CSR instruments and policies really contribute to sustainable development.

This chapter contributes to insight into the effectiveness of CSR on company level by researching the relationship between the commitment, implementation and outcomes of CSR in a coherent way. First, we study this research question for large companies using disaggregated rating data from Sustainalytics. For this purpose, we develop an operational framework that links CSR implementation to CSR outcome based on the data available from the Sustainalytics rating system. Next, we present the results of the empirical analysis. In the next two sections we perform a similar analysis based on the data from the SME survey.

Finally, it should be noted that the outcomes analysed in this chapter partly overlap with impact as defined in the Impact framework. In particular, since outcomes are defined as changes within the company and impacts as changes outside the company), there are two variables discussed in this chapter that should be interpreted as impacts rather than as outcomes. These two variables are GHG emissions and waste production. In the remainder of this chapter, this should be kept in mind.

6.1 Operationalization of framework for large companies

6.1.1 Data

As explained in Chapter 2, CSR performance consists of three parts: CSR output, CSR implementation and CSR outcome. In the econometric analysis on CSR performance, we also include CSR commitment, as this is a relevant prior of CSR performance. Since we only have one output variable, we take output and implementation as one category. Table 6.1 - 6.4 summarize the various indicators that are available from the Sustainalytics rating system for CSR commitment, output&implementation, outcome and control variables. Each of them is measured on a scale from 0 to 100%. Most data concern generic parameters that are available for 1130

companies. For some variables, only sector specific indicators are available for a subset of companies.

Table 6.1 Commitment: list of variables

Variable	Indicator	Description	Mean
		Policies	
Environment	Environmental policy	Quality of the company's environmental policy	40.8
Freedom of association	Policy on freedom of association	Quality of a company's freedom of association and collective bargaining policy	27.1
Discrimination	Policy on discrimination	Quality of a company's policy to eliminate discrimination	42.6
Working conditions[a]	Formal policy on working conditions	Company has a formal policy on working hours and/or minimum wages.	15.0
		Memberships	
Membership	UN Global Compact	Company is a signatory to the UN Global Compact	18.9

[a] Sector specific indicator. See appendix 3.

The first set of variables measures the commitment of the company to CSR. The measure 'environmental policy' indicates the extent to which a company makes use of a formal environmental policy that guides its environmental CSR activities. As the mean of 40.8 shows, companies in this sample have on average an adequate environmental policy. To measure the commitment to social goals, we use policies on freedom of association and discrimination. On average, the companies in our sample only have a weak policy on freedom of associations. The mean value of 42.6 indicates that companies have on average an adequate policy on discrimination. The final variable indicates whether the company is a signatory to the UN Global Compact. As the mean value of 18.9 shows, not many companies in our sample are a signatory to this initiative.

The second set of measures concern the CSR output and implementation employed by the company (see Table 6.2). CSR implementation consists of three social and four environmental measures. The mean value of 16 for programs on diversity indicates that companies on average have implemented only few programs on diversity. Programs on health and safety are more common, but external certifications are still rare. Implementation on GHG emissions is measured by three indicators. The Carbon Disclosure Project (CDP) is an independent not-for-profit organization holding the largest database of primary corporate climate change information in the world. Thousands of organizations from across the world's major economies measure and disclose their greenhouse gas emissions, water use and climate change strategies through CDP. This organization wants to put this information at the heart of financial and policy decision-making. Programs on renewable energy assesses whether companies have taken initiatives to increase the use of renewable energy. The mean value of 13.8 indicates that only few companies on average have done so. Also on programs for reduction of water consumption and waste the average scores are relatively low. A more general instrument to integrate CSR in the organizational procedures is environmental management systems. We use one indicator for the quality of the EMS, namely whether it is externally verified.[37]

Table 6.2 Output and implementation

Variable	Indicator	Description	Mean
		Social issues	
Diversity	Program on diversity	Company has taken initiatives to increase the diversity of its workforce	16.0
Health and safety	Programs and targets to reduce health and safety incidents[a]	Company has employee health & safety programmes and related targets.	44.5
	Health and safety certifications[a]	Company has received external health and safety certifications such as OHSAS 18001, BS8800 or OSHA.	14.8
		Environmental issues	
GHG emissions	Program on GHG emissions	Company has taken initiatives to reduce its GHG emissions from sources that are owned or controlled by the company	38.6
	GHG reporting	Corporate reporting on GHG emissions.	30.7
	Participation in CDP	Company participates in the Carbon Disclosure Project (CDP)	33.1
Renewable energy	Program on renewable energy	Company has taken initiatives to increase the use of renewable energy.	13.8
Water consumption	Programs and targets to reduce water use[a]	Company has programmes to reduce water use.	25.1
Waste	Programs and targets to reduce hazardous waste generation[a]	Company has programmes to reduce hazardous waste generation.	20.7
		Management system	
EMS	External verification EMS	Company's Environmental Management System has received external certification (i.e. according to the ISO 14001 standard)	21.9

[a] Sector specific indicator, see appendix 3

Table 6.3 CSR Outcome

Variable	Indicator	Description	Mean
		Social issues	
Board diversity	Board diversity	Share of women on company boards	40.6
Collective bargaining	% employees covered by collective bargaining agreements	Extent that the company's employees are covered by collective bargaining agreements	29.6

Health & safety	Trend in lost time incidents rate[a]	Trend in a company's lost-time incident rate.	23.9
	Number of fatalities[a]	Company is transparent about fatal accidents and how the company's performance has developed over time.	50.2
Environmental issues			
GHG emissions	Carbon intensity	Carbon intensity relative to peers. The carbon intensity of a company is calculated by dividing total annual Scope 1 & 2 absolute GHG emissions the annual CO2 emissions of a company by annual sales (t.CO2eq./USD m.sales).	46.0
	Carbon intensity trend	Carbon intensity trend. Current year's carbon intensity figure is compared to the average of the past 2 (or 3) years.	25.3
Renewable energy	Renewable energy	Share of company's renewable energy consumption	14.0
Water intensity	Water intensity[a]	(Water use by company*estimated external societal costs of water on society)/annual sales	26.9
Waste intensity	Waste intensity[a]	t.waste./USD m.sales	65.4
Financial performance			
Financial return	ROE, ROA, ROC	Average of ROE, ROA and ROC in 2009 and 2010	6.9
Turnover growth	Growth in revenues	% change in revenues 2010-2007	.10

[a] Sector specific indicator

The third set of variables measure the CSR outcome. It consists of four social, five environmental variables and two economic variables. For the four social measures, companies score relatively well on the number of women in the board and quite low on the percentage of employees covered by collective bargaining. The carbon intensity of the company is measured by the assessment of the absolute emission level in 2010 (divided by sales) and the trend in the past 2 or 3 years. As with all the other sustainability indicators, those indicators concern ratings as assessed by Sustainalytics on absolute values, not absolute values themselves. To calculate carbon intensity, Sustainalytics divides total Scope 1 & 2 absolute GHG emissions (in tCO2-eq) by total sales (in USD m.) for the most recent year.[38] For the trend in carbon intensity in 2010, Sustainalytics compares the 2010 intensity with the average of the three previous years (2007, 2008, and 2009). Compared to GHG emissions, companies score relatively low on the use of renewable energy. The scores on water intensity and particularly waste intensity are more favourable.

Besides value creation in the social and environmental dimensions, CSR also encompasses value creation in the economic dimension. We therefore also include a measure for financial performance. To measure financial performance, we use, as suggested by Griffin & Mahon (1997), a combination of various measures. We use the two year average of three indicators: ROA, ROS and ROE.[39] We also use the variable turnover growth, which is defined as the growth in turnover between 2007 and 2010.

Table 6.4 Control variables

Reporting			
CSR reporting	CSR reporting quality	Company published a sustainability report in the last 2 years and it made use of the guidelines of the Global Reporting Initiative (GRI) for its report. It also provides a review of the application level of GRI	23.6
	External verification CSR reporting	Company's sustainability report has been externally verified according to a report assurance standard	16.1
Corporate governance			
Director responsible	Oversight ESG	Assignment of responsibilities for ESG issues within the company. The higher the score, the nearer oversight is on board level	42.8
CSR bonus	Executive Compensation Tied to ESG Performance	Executive remuneration is explicitly linked to sustainability performance targets, such as health and safety targets, environmental targets, etc.	5.4
Whistleblowers' program	Whistleblowers' program	Quality of the company's programme to combat bribery/ corruption or money laundering	44.3
Independent directors	Board independence	Independence of Supervisory Board members for two-tier boards, or, the independence of Board of Directors members for one-tier boards	36.2
	Audit committee independence	Independence of Audit Committee members	32.9
	Compensation committee independence	Independence of Compensation/ Remuneration Committee members	25.2
	Non audit fees audit fees	Share of non-audit fees relative to audit-fees that the company paid to its auditor(s) in the most recent accounting year	79.8
	CEO duality	Positions of Chairman of the Board and CEO are combined or not. Separation has higher score.	66.8

Table 6.4 summarizes some other variables that will be used as control variables. Including reporting as control variable is important, because the way companies are rated for various output, implementation and outcome variables depends on the reporting quality. By including reporting quality in all these relations, we can control for this direct influence of reporting on the ratings. The mean value of 23.6 indicates that companies on average do not score very high on the quality of their CSR reports, for example because they do not make consistent use of GRI guidelines in reporting about CSR.

The company can employ various measures of corporate governance that foster the integration of CSR in the organization. First, a company can explicitly make the CEO responsible for CSR. The

mean value of 42.8 indicates that the companies in our sample on average have a committee dealing with CSR issues.[40] Furthermore, Table 6.2 shows that executive's remuneration is hardly linked to CSR. Another CSR related corporate governance measure is the existence and quality of a whistleblower's program. The mean value of 44.3 indicates that companies on average have an adequate whistleblower program. To measure the independence of directors, we use four different indicators. The indicator 'Non audit fees audit fees', assessing the ratio between formal and informal fees for auditors, is added because auditors' independence might be compromised by excessive levels of non-audit fees.

6.1.2 Operational framework

Based on the availability of data, we use an operationalized framework that distinguishes four environmental chains for CO2 emission, renewable energy, water consumption and waste production and three social chains for board diversity, health and safety and collective bargaining (see Figure 6.1). In the model for large companies, output and implementation are taken together as one category and not as seperated concepts as in the general IMPACT framework: Sustainalytics does not distinguish output and implementation and we therefore no data is available for such distinctiion. The dataset also does not allow to distinguish CSR outcomes from impacts. In the general IMPACT framework, outcome is interpreted as *relative* change and impact as *absolute* change.

We also test for direct relationships between commitment and outcome. Furthermore, we controlled for company size (measured by the logarithm of the average of total assets and revenues), sector and region.[41] Finally, we included reporting and the independence of directors, as control variables.[42]

To deal with the issue of causality (see e.g. Bollen 1989), we use a pragmatic approach and use 2008 indicators for independent variables and 2010 indicators for dependent variables.

6.2 CSR performance of large companies

In this section we present the results of the empirical analysis for CSR performance of large companies using confirmatory factor analysis, multiple regression analysis and a structural equation model.[43]

6.2.1 Confirmatory factor analysis

Bivariate correlation analysis shows that a large number of cross relationships between commitment, output, implementation and outcome are significantly positive. Because bivariate correlation analysis only provides a very weak indication of causality (and because of the high number of relationships), we refrained from reporting these results and proceed with performing confirmatory factor analysis on subsets of variables that can theoretically be grouped in factors to reduce the number of variables. The results are reported in Table 6.5 (see below).

Figure 6.1 CSR performance: operationalized framework for large companies

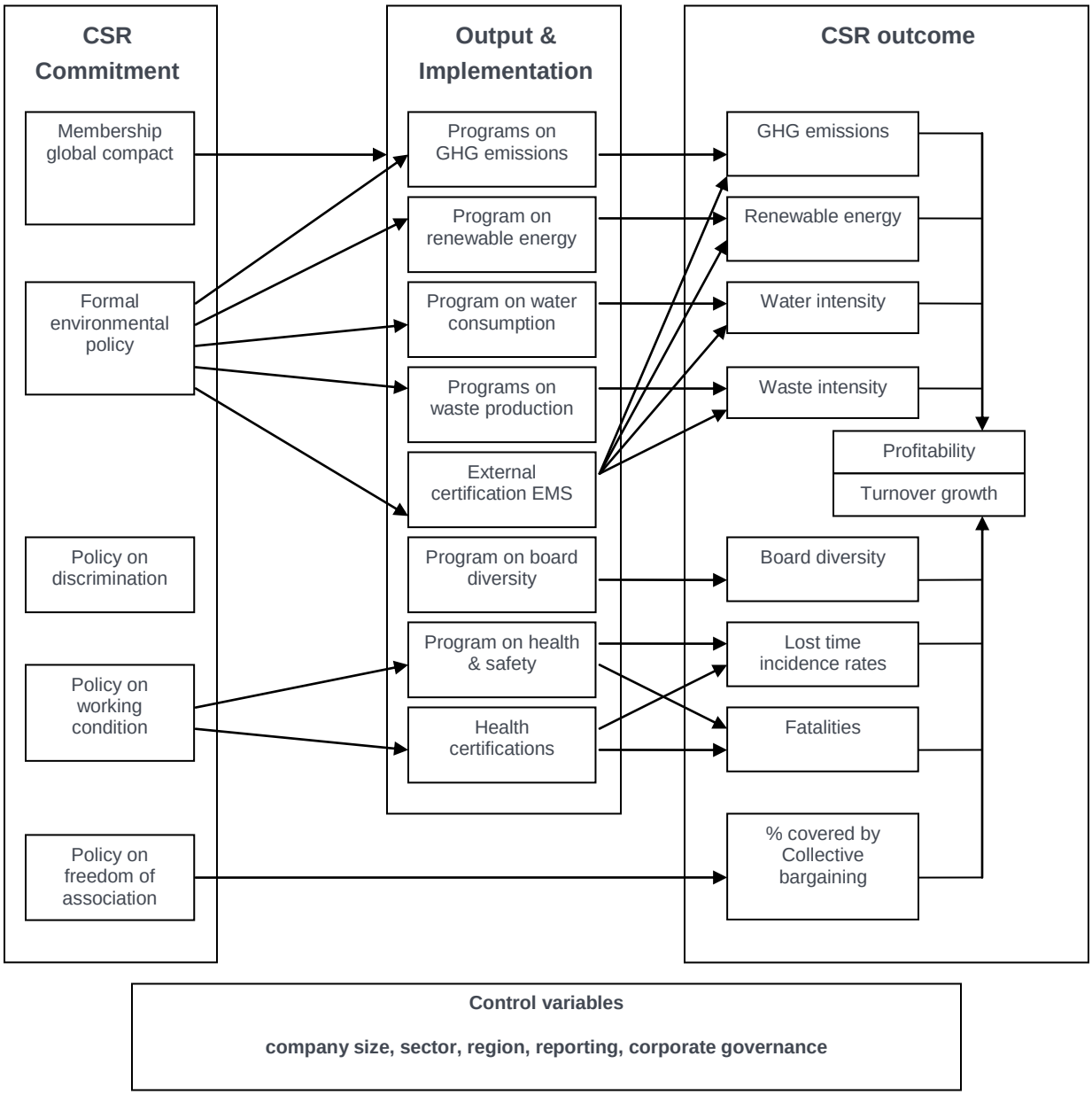


Table 6.5 Results of confirmatory factor analysis

Factor	Indicators	Cronbach alpha
GHG implementation	Program on GHG emissions, GHG reporting, Participation in CDP	0.80
GHG performance	GHG intensity, GHG intensity trend	0.59
Reporting	CSR reporting quality, External verification CSR reporting	0.50

Independent directors	Board independence, Audit committee independence, Compensation committee independence, Non audit fees audit fees, CEO duality	0.61

For GHG implementation and independent directors, the Cronbach alpha reveals the internal consistency of these measures. Since the Cronbach's alphas are larger than .60, this implies that this measure is internally consistent (Hair, Anderson, Tatham, & Black, 1998). Although the internal consistency of GHG impact and reporting is relatively low, the use of the factors is justified on theoretical grounds as in both cases the indicators are theoretically related. The rather low score may be due to the fact that there are only two items within these factors (Peterson, 1994). According to Schmitt (1996) this low reliability may not be a major impediment to its use if there is a meaningful content coverage.

6.2.2 Multiple regression analysis

For each chain, we performed multiple regression analyses that corresponds to the various paths as depicted in Figure 6.1. Table 6.6 – 6.7 summarize the results for output & implementation and outcome respectively. Each column presents a separate relationship, with the dependent variable showed in the head of the column and the independent variables in the rows. Blank cells indicate that the variable was not entered in the specific relationship.

Table 6.6 reports the estimation results for CSR output & implementation. For GHG emissions, use of renewable energy, waste production, external verification of EMS and diversity, we find that commitments as expressed by related policies significantly contribute to implementation of programs in the respective fields. Also membership of Global Compact affects implementation in some cases, namely GHG programs, external verification of EMS and diversity. For water and health and safety, no significant relationships are detected between commitment and output&implementation.

Furthermore, we find some influences of various control variables, such as reporting quality (on programs for GHG emissions, renewable energy, external verification and diversity), oversight ESG (on programs for GHG emissions and use of renewable energy), CSR related remuneration schemes (on water programs) and board independence (on health and safety programs). The independence of directors seems to have a significant negative influence on the GHG and renewable energy programs and on diversity program. Also the size of the company increases the implementation of CSR programs. The type of sector or region influences implementation in some cases, but the influence is highly diverging.

But does CSR commitment, CSR output & implementation of environmental CSR issues effect CSR outcome? For this, we have to look at the results in Table 6.7. As the results show, there is hardly any significant direct influence from CSR commitment on the environmental outcomes. In contrast, the social outcomes are affected by the respective policies on discrimination and freedom of association. But for lost time incidence we find a negative effect of commitment. This may indicate reverse causation, companies with a high rate of lost time incidence paying more attention to it. Output&implementation incidentally affects CSR outcome: GHG programs and external verification of EMS reduce GHG emissions, programs on renewable energy stimulate the use of renewable energy, programs on board diversity enforce diversity. But for the other aspects

of CSR outcome we find no relationship between output&implementation and outcomes. For health and safety we again even find a contrary influence, the presence of programs being positively related to high lost time incidence. This shows that the implementation of a program can make a difference, but does not do so in all cases.

Table 6.6 Multiple regression analysis: output & implementation[a]

	GHG	Renewable energy	Water	Waste	External verification EMS	Program diversity	Health & safety program	Health certification
Commitment								
Membership Global Compact	.10***	.03	-.01	.09 (p=.15)	.06**	.11***	.03	.06
Formal environmental policy	.18***	.09***	.09 (p=.12)	.12**	.23***			
Policy on discrimination						.08*** (p=.013)		
Policy on freedom of association								
Policy on working conditions							.09	.02
Control variables								
Reporting	.21***	.18***	.09	.00	.09***	.13***	-.02	.07
Oversight ESG	.10***	.08***	.02	-.04	.02	.05 (p=.12)	.12	.14 (p=.107)
CSR remuneration	.03	-.01	.10**	-.02	-.01	.03	-.19**	-.03
Whistleblowers program	.05*	-.01	-.08	.01	.02	.01	-.02	-.07
Board independence	-.05*	-.07**	-.09	.04	.02	-.05*	.21**	.04
Size	.25***	.17***	.14**	.13**	.06*	.31***	.17*	.17**
Energy	.05	-.06*	-.03	.10	.15***	.01	X	X
Material	.09***	-.01	.07	-.03	.25***	.07**	-.07	-.04
Industry	.16***	-.01	X	X	.32***	.01	X	X
Consumer	.12***	.09**	.04	.10*	.18***	.03	.00	-.15*
Health	.07**	.01	X	-.02	.12***	.04	X	X
IT&comm	.12***	.11***	-.07	.14**	.29***	.03	.11	.07
Anglo Saxon non-EU	.19***	.08	.18**	.00	-.23***	.01	-.14	.01
Anglo Saxon EU	.17***	.04	.14**	-.07	-.08**	-.08**	-.19**	.01
Scandinavia	.16***	.05	.03	.00	.07**	.00	-.20**	.14
Mediterranean Europe	.00	.01	.16**	-.05	.02	-.07*	.02	.16*
Other Western Europe	.11***	.17***	.09	-.06	-.06	.07	-.07	.12
R2	.334	.167	.108	.102	.328	.232	.137	.187
F	24.26***	11.01***	2.60***	2.11***	26.92***	17.16***	1.64*	2.25***

N	940	1065	384	354	1065	1100	181	173

[a] Standardized coefficients; * p<0.10; ** p<0.05; *** p<0.01. X indicates that no observations are included in the sample for the respective variable.

Furthermore, we again detect some influences from the control variables. Reporting quality improves the use of renewable energy and collective bargaining, but increases water and lost time incidence. If the board takes responsibility for CSR, diversity, safety and health and respect of collective bargaining benefit. CSR related remuneration helps reducing waste production. The independence of directors positively affects use of renewable energy and diversity. Overall, however, the effects are very modest and in many cases we also negative (but insignificant) influences. This is also the case for the size of the companies and many sectoral dummies. Regional influences are particularly significant for diversity and collective bargaining.

Table 6.7 Multiple regression analysis: outcome[a]

	GHG intensity	Renewable energy	Water	Waste[b]	Diversity	Lost time incidence	Fatalities	Collective bargaining	Profit	Turnover growth
Commitment										
Membership Global Compact	.04	.00	.10	.00	.05	.06	.18	.04	-.02	.07
Formal environmental policy	.03	-.04	.03	-.01					-.01	.00
Policy on discrimination					.06*				-.07*	.09*
Policy on freedom of association								.11***	.09***	-.06
Policy on working conditions						-.23**	-.18			
Output&Implementation										
GHG implementation	.22***								.13***	-.04
Renewable energy program		.31***							-.05	.01
Water program			.02							
Waste program				.02						
External certification EMS	.08**	.04	.04	.09					-.01	-.13***
Diversity program					.07***				.02	-.03
Health & safety program						-.26**	.04			
Health & safety certification						.15 (p=.117)	-.05			
Outcome										
GHG intensity									.08***	.02
Renewable energy									-.05	.01
Diversity									.17***	-.08**
Collective bargaining									-.05	.02
Lost time incidence										
Number of fatalities										
Control variables										

Reporting	.06	.11***	-.16**	.01	.00	-.40***	.05	.11***	.03	.01
Oversight ESG	.05	.01	.09	.02	.07**	.18*	-.07	.06**	-.03	-.02
CSR remuneration	.00	-.01	-.10	.12**	.01	.03	.07	-.03	-.02	-.07**
Whistleblowers program	.00	.01	-.02	.02	-.03	.11	.16	-.02	.00	-.01
Board independence	-.02	.07**	.04	-.03	.08***	-.01	-.08	-.02	-.05	-.03
Size	.07*	.09***	-.02	.07	.18***	-.18*	-.35***	.12***	-.11***	-.06
Energy	-.11***	-.17***	X	.21***	-.05	X	X	.12***	.13***	.15***
Material	-.09**	.02	.50***	-.02	-.14***	-.16	.35***	.19***	.26***	.08**
Industry	-.18***	-.06	.08	X	-.04	X	X	.11***	.21***	.08*
Consumer	-.26***	-.09**	-.06	X	.08**	.01	.09	.10***	.33***	.13***
Health	.08**	-.06*	X	.06	.05	X	X	.02	.27***	.17***
IT&comm	-.15***	-.05	.08	-.15**	-.02	X	X	.09***	.26***	.16***
Anglo Saxon non-EU	-.06	.15***	.05	-.04	.60***	.17	.16	.06	.16**	.14*
Anglo Saxon EU	-.02	.08**	-.10	-.02	.21***	.12	-.05	-.01	.19***	.41***
Scandinavia	.04	.13***	-.08	-.01	.41***	.00	.04	.14***	.04	.17***
Mediterranean Europe	.00	.02	.03	-.09	.15***	.19*	-.06	.40***	.11**	.11***
Continental Western Europe	.03	.23***	.07	-.06	.29***	.21	-.06	.30***	.11*	.18***
R2	.231	.216	.341	.117	.272	.347	.290	.381	.230	.195
F	12.44***	13.69***	4.33***	2.02***	19.50***	2.81***	2.16**	33.86***	8.88***	6.86***
N	889	1065	178	309	1065	107	107	1064	893	849

[a] Standardized coefficients; * p<0.10; ** p<0.05; *** p<0.01. X indicates that no observations are included in the sample for the respective variable.
[b] Because of lack of observations for 2010, we used 2009 observations of waste production.

The last columns of Table 6.7 presents the results of two regression analyses in which profits and turnover growth are regressed on the relevant social, environmental and governance variables controlling for the size of the company, the sector and the region. With respect to profits, a policy on freedom of association, programs on and the reduction of GHG emissions and board diversity have significant and positive influences on profits, suggesting that companies that respect collective bargaining, are able to reduce their emissions and companies that have more women in the board have a better financial performance. We do hardly find any positive influences from commitment, output&implementation or CSR outcomes on turnover growth. Instead, we do find some negative influences for external verification of EMS, board diversity and CSR related remuneration. Taking these effects of CSR on profits and turnover growth together, there is no strong support against nor in favour of a link between CSR and financial performance of companies.

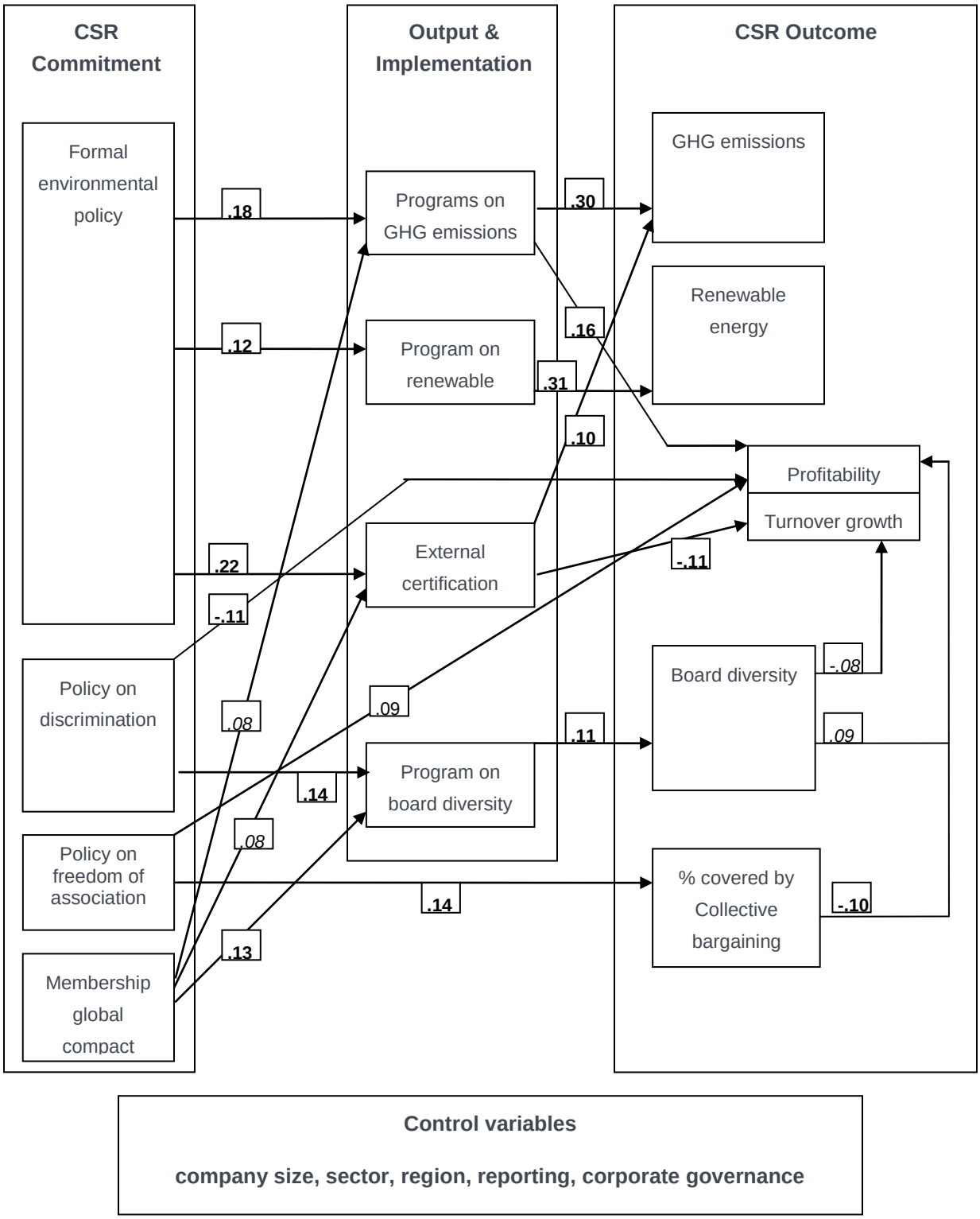
6.2.3 Structural equation model

In order to test for the nomological validity of our empirical model, we use structural equation modeling (SEM) to test whether these relationships also hold when tested simultaneously. We only used the generic data basis in order to secure a large sample of companies.

The full details of the SEM estimation results are reported in appendix 2. Figure 6.2 only reports the most relevant relationships. Most relationships that are significant in the regression analysis are also significant when they are estimated simultaneously. Still, there are some differences. For implementation and output, some governance variables become insignificant (i.e. the influence of oversight ESG on GHG implementation and the influence of board independence on renewable energy implementation). All the other influences are almost identical to the results in the regression analysis. In contrast, when we look at the outcome part of the model, we now see a significant positive influence from oversight ESG on GHG intensity.

Furthermore, we now find a significant negative effect of collective bargaining on profits, which may indicate that more intense collective bargaining balances the powers between employees and the company, therefore reducing the tangible company benefits (profits). Also a larger board independence reduces profits, which might be explained by a rebalancing of profits and intangible social and environmental benefits (which is collaborated by the significant positive influence of board independence on the social outcome diversity and environmental outcome renewable energy). Another relevant difference is that the direct effect from a policy on discrimination on board diversity becomes insignificant (although we still find the indirect effect via programs of diversity). This is a further indication of the relevance of implementation measures for actual realization of CSR. The only significant direct effect from commitment on outcome in our model is the influence from a policy on discrimination on collective bargaining, maybe also because we lack an implementation variable for this aspect. Since all the indirect effects remain significant (and also have the expected sign), we can conclude that the structural equation model confirms our claim that the implementation of CSR is a crucial stage for its realization.

Figure 6.2 Structural equation model for performance large companies[a]



[a] Standardized coefficients; bold: p<.01; italics: p<.05; normal: p<.10.

6.2.4 Conclusion

The econometric analysis confirms most of the relationships that are hypothesized in the conceptual model. In 7 out of 8 potential (non sector specific) cases for GHG emissions, renewable energy and diversity, there is a positive association between the company's commitment to CSR and CSR implementation that integrate CSR in the organizational procedures. Second, in 4 out of 5 (non sector specific) cases, a higher level of CSR implementation improves the CSR outcomes in the social or environmental dimension. For collective bargaining, we detect a relationship between commitment and outcome. However, in the case of sector specific links for water and waste production or health and safety, no positive relationships between commitment, implementation and outcome are found. This shows that the hypotheses that commitment stimulates implementation and that implementation fosters positive outcomes are not robustly confirmed for all environmental or social aspects of CSR. Furthermore, we find an ambiguous relationship between the commitment and implementation of CSR and financial performance.

With respect to governance measures, we find that the independence of directors positive influences performance in the environmental and social dimension, favouring the agency theory over the stewardship theory with respect to CSR issues. For the other control variables, we find that the size of the company has a significant influence in most relationships: as expected, larger companies show a higher level of CSR implementation and CSR outcomes than smaller companies. The influences from sector and region are ambiguous.

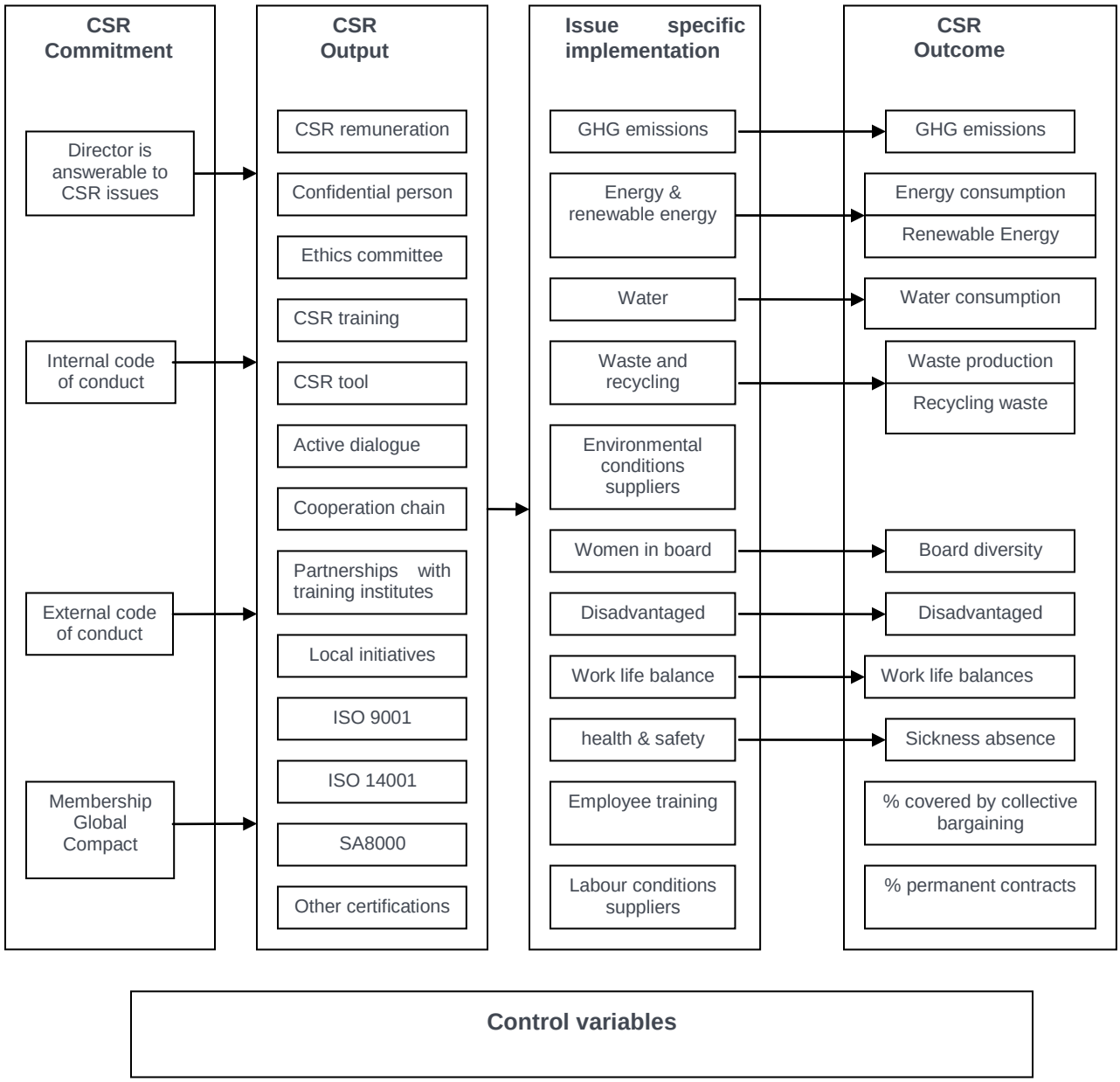
Although this paper provides important insights into the effectiveness of CSR in fostering CSR goals, we should keep in mind some limitations of our analysis. First, rating data depends heavily on the reporting of companies on the various CSR aspects. Companies that have no strong record on CSR reporting, are also expected to get a lower score on *all* other CSR aspects. We correct for this by including reporting as a control variable (see e.g. Kolk, A., & Mauser, A. 2002).

Secondly, it is difficult to empirically assess causality and more specifically simultaneity. As suggested by de Vaus (2001), to infer that a causal relationship exists between two variables, two basic criteria must be met: (i) there must be a co-variation (or correlation) of predictor and outcome variables; and (ii) the assertion that one variable affects the other. The first criterion was taken account for by using various techniques. The second criterion was met by the theoretical framework that underlies the empirical analysis. Still, we cannot always exclude that reverse causation is also possible. For example, financial results might also influence CSR commitment. Due to lack of proper instrumental variables, the estimation techniques that we used do not disentangle the possible bi-directional causal influences. Although we softened the implications of this issue by using lagged variables, we still must be careful when interpreting the results for these relationships.

6.3 Operationalization of framework for SMEs

In order to take account of the specific nature of CSR in SMEs, the structure of the data from the SMEs survey diverts from the data on CSR performance of Sustainalytics. The conceptual framework therefore requires a different operationalization of the model (see Figure 6.3).

Figure 6.3 CSR performance: operationalized framework for SMEs



Our datasets now allows us to explicitly between outputs and implementation as in the general IMPACT framework. As in the analysis for large companies, we however do not explicitly distinguish CSR outcomes and impacts as defined in the general IMPACT framework in order not to make the analysis too complex.

As described in chapter 3, the survey measures four types of commitment: director is answerable to CSR issues; internal code of conduct, external code of conduct and membership of Global Compact or other international initiatives. Output is measured by a number of concrete instruments that integrate CSR in the internal organization of the company and external relations with stakeholders. In contrast to large companies, the SME survey researches informal indicators of issue specific implementation of CSR. In particular, it comprises three types of indicators of the

implementation of CSR at the issue-specific level: the effort that companies spend on improving specific CSR issues, whether the company measures and uses targets for the realisation of the respective CSR aspects and whether it reports the realization of the targets. For each of them the survey obtained data for a number of concrete environmental and social aspects of CSR. For (most of) these categories we also have data on the CSR outcome, measured in absolute levels as well as by the change in outcome between 2007 and 2010. As control variables, we use the same variables as in the model of drivers of CSR.

6.4 CSR performance of SMEs

In this section we present the results of the empirical analysis for CSR performance of SMEs using again confirmatory factor analysis, multiple regression analysis and a structural equation model.[44]

6.4.1 Factor analysis

Just as for large companies, bivariate correlation analysis shows a large number of significant cross relationships between commitment, output, implementation and outcome. We therefore proceed with factor analysis to reduce the number of explanatory variables and possible multicollinearity.

Table 6.8 Factor analysis of output (Oblimin; structure matrix)

	External cooperation	Internal organization	Certifications
Active dialogue with NGOs	.614		
Cooperation in supply chain	.650		
Partnerships with professional training institutes	.665		
Participation in local initiatives	.744		
Remuneration linked to CSR		.634	
confidential person /whistleblower procedure		.582	
Ethics committee		.705	
CSR Training program		.601	
Measurement tool		.608	
ISO 9001/9002/9003			.738
ISO 14001			.759
SA 8000			
Other			.546
Eigenvalue	3.564	1.107	1.321
Cronbach alpha	0.772	0.652	0.672

Table 6.8 presents the results of explorative and confirmatory factor analysis for thirteen output variables. The explorative factor analysis reveals three factors.[45] The three factors can be

interpreted as expressing instruments that foster external cooperation, the internal organization of CSR and certifications. The validity of these factors is confirmed by the confirmatory factor analysis, since the Cronbach alpha exceeds 0.60 in all three cases. If we include SA8000 in certifications, then the Cronbach alpha rises from 0.672 to 0.752. Therefore, we include SA8000 in the third factor.

Table 6.9 reports the outcomes of explorative and confirmatory factor analysis for eleven issue-specific implementation of CSR. The explorative factor analysis for CSR effort reveals two factors for social aspects and for environmental aspects. For (the average of) measuring, targeting and reporting, a similar result is found. Employee training and health & safety also load on the environmental factor, but since the loadings on the social factor are higher, we include it in the social factor. The validity of the four factors is confirmed by the Cronbach's alpha.

Table 6.9 Factor analysis of implementation

	Effort		(unweighted) average of measuring, targeting & reporting	
Share of women in board and/or executive positions	.623		.758	
Share of employees recruited from disadvantaged groups	.587		.742	
Work-life balance	.658		.781	
Reduction in work place accidents and/or sickness absence rate	.643		.747	.596
Employee training	.667		.779	.594
Labour conditions suppliers	.553		.708	
Reduction of CO2 emissions		.768		.835
Reduction in energy consumption and/or increase in use of renewable energy		.793		.903
Reduction in water consumption		.776		.872
Reduction in waste and/or increase in recycling of waste		.750		.890
Environmental conditions of suppliers/subcontractors		.692		.735
Eigenvalue	1.586	3.699	1.478	5.666
Cronbach alpha	0.684	0.814	0.866	0.905

Table 6.10 presents the outcomes of explorative and confirmatory factor analysis of twelve changes in and levels of CSR outcomes. We find four factors for changes in outcomes and five factors for levels of outcomes. However, in six cases, the Cronbach alpha is very low. For these factors, we will therefore analyze the variables separately.

Table 6.10 Factor analysis of outcome (Oblimin; structure matrix)

	Social					Environmental			
	Change 2007-2010		Level in 2010			Change 2007-2010		Level in 2010	
Share of women in board and/or executive positions					.85				
Share of employees recruited from disadvantaged groups as % of total inflow		.53			.65				
Number of overtime hours as % of total FTEs		.76	.77						
Sickness absence rate		.63	.70						
Share of employees covered by collective bargaining agreement	.81			.78					
Share of permanent employment contracts as % of total number of employment contracts	.80			.76					
CO2 emissions[a]						.77		.82[a]	
Energy consumption						.87		.83[a]	
Use of renewable energy							.76		-.71
Water consumption						.82		.85[a]	
Waste production						.81			.76[a]
Recycling of waste							.77		
Eigenvalue	1.75	1.07	1.30	1.21	1.02	3.00	1.26	2.31	1.13
Cronbach alpha	0.60	0.34	0.23	0.30	0.25	0.84	0.50	0.81	0.00

[a] natural log

6.4.2 Multiple regression analysis

Table 6.11 reports the multiple regression analysis of output for the three factors described above. In all cases, the four commitment variables are significantly positively related to the use of instruments. For the control variables, we find that all three types of output are positively related to the size of companies and market leadership and negatively related to the region of Scandinavia. Companies operating in B2C relations are more prone to use instruments that facilitate external cooperation and internal organization, but are significantly less actively using certifications. Companies in the manufacturing sector (except textile) are more inclined to use certifications than companies in the service sector.

Table 6.12 reports the results of the multiple regression analysis of the four factors of issue specific implementation. For all factors, we find a significant positive relationship with output for

external cooperation, internal organization and certifications. Also the commitment variables affect implementation positively. This indicates that the influence of commitment is not completely mediated through output. For the control variables, we find again that company size exerts a positive influence on CSR implementation. Also companies in B2C relationships put more effort in improving CSR and are more actively using procedures for

Table 6.11 Multiple regression results: output[a]

	External cooperation	Internal organisation	Certifications
commitment			
Director answerable	.25***	.20***	.06***
Internal code	.08***	.15***	.12***
Public code	.13***	.13***	.11***
Global initiative	.16***	.33***	.11***
control variables			
Size	.17***	.08***	.28***
Age<25Y	.06***	.04***	.01
Age 25-50 Y	.00	.00	.00
Medium skilled	.00	.03**	.03**
High skilled	.06***	.03**	.00
Market leader	.03***	.03**	.04***
Follower	.01	.01	.03**
Level playing field	-.01	.01	-.00
B2C	.08***	.03***	-.10***
Anglo Saxon EU	-.07***	.01	.03***
Scandinavia	-.14***	-.17***	-.09***
Mediterranean Europe	-.19***	-.07***	.01
Continental Europe	-.13***	-.02	.02
Agriculture	.02**	.02*	-.01
Mining	.02**	-.01	.01
Food	.02*	-.01	.02*
Textile	.01	-.01	-.05***
Paper	.01	.00	.04***
Oil & Chemical	.01	.02**	.07***
Metal	-.01	.00	.07***
Machine	.00	.00	.04***
Transport	.00	-.00	.02
Other manufacturing	.03*	-.01	.06***
Electricity, gas & water	.03***	.00	-.00
Construction	-.01	.00	.05***
Trade & hotels	-.03**	-.02	-.05***

Transport services	-.00	.01	.02
Telecommunications	-.00	-.03***	-.03***
Finance	-.03**	.01	-.08***
Real estate	-.01	-.02	-.02*
Other services	.02	-.00	-.02
R^2	0.28	0.36	0.27
F	76.0***	105.8***	69.0***

[a] beta coefficients; * p<0.10; ** p<0,05; *** p<0,01; Based on 6475 companies

Table 6.12 Multiple regression results: implementation[a]

	Effort		Measuring, targeting and reporting	
	Social	Environmental	Social	Environmental
commitment				
Director answerable	.08***	.09***	.05***	.04***
Internal code	.12***	.07***	.10***	.08***
Public code	.01	.04***	.02	.03**
Global initiatives	-.03	.01	.07***	.10***
output				
External cooperation	.17***	.15***	.14***	.13***
Internal organization	.13***	.08***	.17***	.10***
Certifications	.05***	.18***	.07***	.11***
control variables				
Size	.12***	.03***	.19***	.13***
Age<25Y	.02*	.01	.02	-.00
Age 25-50Y	.04***	.02*	.01	-.01
Medium skilled	.05***	.01	.01	-.00
High skilled	.05***	-.05***	.01	-.02*
Market leader	-.01	-.02*	.03**	.06***
Follower	-.02**	-.02*	-.02	.04***
Level playing field	-.02	-.01	.00	.07***
B2C	.03**	.07***	.02*	.04***
Anglo Saxon EU	-.09***	-.03**	-.02	.01
Scandinavia	-.20***	-.03*	-.04***	-.04**
Mediterranean Europe	-.17***	.03	.11***	.02
Continental Europe	-.23***	-.08***	-.00	.02
Agriculture	-.02	.02*	-.00	.00
Mining	-.01	.01	.00	.01
Food	.01	.03**	.02	.06***

Textile	.00	.0	-.01	.00
Paper	-.01	.03**	-.01	.03**
Oil & Chemical	-.01	.03***	.01	.04***
Metal	-.01	.03**	.02	.04***
Machine	-.02	-.02	-.01	.01
Transport	-.01	-.01	-.00	.02**
Other manufacturing	-.03*	.03*	.02*	.06***
Electricity, gas & water	-.02*	.02	.03***	.06***
Construction	-.02*	-.01	.02	.01
Trade & hotels	-.02	.01	.01	.01
Transport services	-.00	.03	-.00	.01
Telecommunications	-.01	-.04***	.01	-.03**
Finance	-.02	-.03**	.03***	-.01
Real estate	-.02	.00	.00	.02*
Other services	.01	-.06***	.01	-.03*
R^2	.20	.21	.29	.24
F	45.3***	43.7***	70.6***	56.4***
Endogeneity test[b]	0.89	2.12*	1.70	.51

[a] beta coefficients; * p<0.10; ** p<0,05; *** p<0,01; Based on 6745 companies
[b] F-test on residuals of external cooperation, internal organization and certifications[46]

measurement, targeting and reporting on CSR. Furthermore, companies from Scandinavian countries are less actively implementing issue specific CSR measures.

Table 6.13 report the estimation results of the multiple regression analysis of the change in outcomes. For almost all subgroups, both issue specific effort and issue specific measuring, targeting and reporting significantly improved the changes in outcomes during 2007-2010. In a few cases, also commitment or output has a positive effect on changes in outcomes, but in many cases the influence is rather small and sometimes ambiguous. This shows that most of the effect from commitment and output on outcome is mediated through issue specific implementation. For the control variables, we find some interesting regional influences. For example, the total (average) changes in social outcomes reveal that Scandinavia, Mediterranean and continental Western Europe have performed relatively well compared to UK and East European countries. This contrasts with our earlier finding in Chapter 5 where we found that SME's CSR performance is relatively poor in Scandinavia and continental Europe. The explanation is that this applies to commitment, output and implementation, but not to outcome.

Table 6.13 Multiple regression results: change in outcomes[a]

	Women in board	Recruitment disadvantaged groups	Overtime hours	Sickness absence	Collective Bargaining & permanent contracts	CO2, energy, water & waste	Renewable energy & recycling of waste	Total social	Total environment
Commitment									
Director answerable	-.02	.03*	.03**	.01	-.01	.02	.03**	.01	.04**
Internal code	.00	-.01	.01	-.01	.02	.03*	-.00	.00	.03**
Public code	.01	.01	-.02	.00	-.02	-.00	-.01	-.01	-.01
Global initiatives	-.02	-.03*	-.00	-.00	-.04***	.02	-.01	-.03**	.01
Output									
External cooperation	.05***	.01	-.01	.01	.04**	.02	.04***	.06***	.05***
Internal organization	.03*	-.01	.03	.05***	.04**	.01	-.03*	.05***	-.00
Certifications	.00	.00	.01	.03**	.00	.03*	.02	.01	.04**
Implementation									
Effort	.17***	.18***	.03*	.05***[b]	.09***	.13***	.06***	.15***	.14***
Measurement. targeting & reporting	.05***	.11***	-.02	.07***	.01	.12***	.09***	.06***	.15***
Control variables									
Size	.08***	.00	-.02	-.02	.00	-.06***	.03*	.02	-.04***
Age<25Y	.04***	.03**	-.06***	.00	.07***	-.06***	.00	.05**	-.06***
Age 25-50	.03**	.02	-.02	.02	.05***	-.05***	.03**	.05***	-.04**
Medium skilled	.02	-.00	-.03*	-.03*	.01	-.03*	.01	-.01	-.03
High skilled	.05***	-.01	-.06***	.00	.03	-.03*	-.01	.01	-.04**
Market leader	.02	-.01	.01	.03*	-.02	.01	.01	.01	.01
Follower	-.01	-.02	.05***	.03*	.02	-.01	-.01	.03**	-.01
Level playing field	-.03	-.03*	.02	-.01	-.03	.02	-.04**	-.04**	-.01
B2C	-.02	-.03**	-.01	.01	-.00	-.01	-.01	-.01	-.01
Anglo Saxon EU	.03**	-.01	.02	.06***	.00	.01	.05***	.05	.04**
Scandinavia	.06***	.05***	.01	.09***	.03	.00	.03	.09***	.01
Mediterranean Europe	.02	-.02	.09***	.04	.11***	-.01	.04**	.10***	-.00
Continental Europe	.13***	.07***	-.07**	-.00	.07***	-.02	.08***	.10***	.01
Agriculture	.02	.03**	.01	.05***	.00	-.02	.03*	.04***	-.00
Mining	.00	.01	-.00	-.01	.00	.00	.01	-.00	.01
Food	.02	.02	.00	.03*	.01	-.00	.02	.03*	.01
Textile	-.01	-.01	.02	.01	-.02	.02	-.01	-.01	.02
Paper	.00	.00	.01	-.01	-.03*	.03*	.02	-.02	.04***
Oil & Chemical	.03*	.02	-.02	-.00	.01	-.02	.01	.02	-.01
Metal	-.03**	-.01	.06***	.03*	-.03	.04**	-.02	-.00	.03**

Machine	-.01	.06***	-.00	.01	-.03	-.03*	.03**	.00	-.02
Transport	.01	-.01	.04***	.00	.02	.02	-.03**	.02	.01
Other manufacturing	-.02	.00	.04**	.01	-.03*	.01	.02	-.01	.02
Electricity, gas & water	.02	-.00	-.00	-.01	-.02	-.02	.03**	-.01	-.00
Construction	-.01	-.00	.02	.03	-.00	.00	.02	-.00	.01
Trade & hotels	.01	.02	.01	.04**	.00	-.02	.02	.03*	-.01
Transport services	-.00	.01	.00	.03*	.03*	.00	-.01	.02	-.00
Telecommunications	.00	.01	.04**	.01	.02	-.01	.02	.03*	.01
Finance	.02	-.02	.01	-.02	-.01	.01	.01	-.01	.02
Real estate	-.02	-.01	.00	.01	-.02	.02	-.05***	-.02	-.00
Other services	-.01	.02	.02	.03	.00	-.02	.02	.01	-.01
R^2	.09	.09	.03	.03	.04	.07	.05	.09	.10
F	13.7***	12.3***	4.5***	4.3***	5.09***	9.8***	6.3***	12.5***	14.2***
Endogeneity test[c]	2.54	0.29	0.12	1.17	0.43	1.28	0.56	0.45	0.30

[a] beta coefficients; * p<0.10; ** p<0.05; *** p<0.01; Based on 5307 companies
[b] For effort we used the effort to improve work life balance
[c] F test on residuals of effort and measurement, targeting and reporting

Table 6.13 provides insight into the change in outcomes, but not in the absolute level of the outcomes. These results for 2010 are presented in Table 6.14.

The first column shows that only the issue specific implementation (i.e. the effort to increase the share of women in board and/or executive positions) is significantly related to the share of women in board and/or executive position. Hence, commitment and output are completely mediated by effort. Besides, as one can expect for level equations, the control variables are important. First, the share of women declines with the size of the company. This indicates that women have more opportunities to manage a small company than a large company. This is also confirmed by the effects of market position, which show that female directors or executives more often run a company in a niche market. Furthermore, female presence in board or executives is more common in companies operating in B2C relations than in B2B relations. An interesting finding is that SMEs in East Europe are relatively more often led by female executives. Finally, there are various sectoral patterns that are in line with expectations. Whereas most manufacturing sectors (except textile) and the construction sector have a relatively low presence of women in the board or executive level, other services provide relative more opportunities for female managers.

Table 6.14 Multiple regression results: level of social outcomes[a]

	Women in board	Recruitment disadvantaged groups	No overtime hours	Low sickness absence[b]	Collective Bargaining	Permanent contracts[c]	Training per fte[c]
Commitment							
Director answerable	-.03**	-.01	.03*	.01	-.04***	.01	-.03*
Internal code	.02	.04***	.02	-.02	.01	.02	.04**
Public code	-.01	-.03*	-.02	-.01	.02	-.01	.01
Global initiatives	-.01	.01	.01	.03**	-.00	.01	.00
Output							
External cooperation	.01	.05***	-.05***	-.02	.04***	.01	.02
Internal organization	-.02	-.01	.01	-.03	-.02	-.05***	.08***
Certifications	-.02	-.01	-.04*	.01	.02	.03*	.00
Implementation							
Effort	.51***	.39***	.10***	.05***	.08***	.05***	.10***
Measurement. targeting & reporting	.02	.13***	-.04**	-.02	.02	-.03**	-.02
Control variables							
Size	-.09***	-.05**	.02	-.22***	.15***	.15***	-.14***
Age<25Y	-.01	.05***	-.09***	-.06***	-.01	.00	.01
Age 25-50 Y	-.03**	.04**	-.03	-.07***	.01	.07***	.03
Medium skilled	-.03**	-.07***	.01	.09***	-.02	.03*	.10***
High skilled	.01	-.09***	-.02	.13***	-.14***	.02	.10***
Market leader	-.02*	.00	-.02	-.01	-.03**	-.00	-.01
Follower	-.02	.01	.02	.01	-.02	-.00	-.05***
Level playing field	-.03**	.01	.01	-.02	.02*	.01	-.06***
B2C	.04***	-.01	.02	-.06***	.02*	-.04**	.01
Anglo Saxon EU	-.04***	.02	-.01	.11***	-.05***	.04**	.01
Scandinavia	-.07***	.03	.03	.17***	.30***	.01	.02
Mediterranean Europe	-.12***	-.04*	.09***	.23***	.63***	.00	-.06**
Continental Europe	-.11***	.05**	-.03	.16***	.35***	-.02	.02
Agriculture	-.02*	.02	-.00	.03*	.05***	.00	.01
Mining	-.01	-.03*	-.01	-.02	.04***	-.01	.00
Food	.01	.01	.02	.02	.03**	.00	-.02
Textile	.05***	-.01	.04*	-.03*	.05***	.01	.03
Paper	.00	.02	.01	-.02	.03**	-.01	-.02
Oil & Chemical	.01	.03*	.02	-.01	.01	.01	-.00
Metal	-.04***	.02	-.01	-.05***	.08***	.02	-.01
Machine	-.05***	-.01	-.03	-.04**	.04**	.01	.04*

Transport	-.01	-.01	-.03*	-.04**	.00	.00	-.02
Other manufacturing	-.02	.01	.03	-.02	.02	.01	-.02
Electricity, gas & water	-.02	-.01	.00	.01	.07***	.01	-.00
Construction	-.06***	.00	-.02	-.01	.06***	.03*	.04*
Trade & hotels	.01	-.00	.03	.04**	.02	.00	.01
Transport services	-.02	-.01	-.05***	.00	.04***	.00	.00
Telecommunications	-.04***	-.00	.01	.00	-.01	.01	.06***
Finance	-.01	-.02	.02	.02	.03**	.00	.02
Real estate	-.01	.00	.00	.01	.00	.02	.01
Other services	.06***	.01	-.03	-.02	.02	-.01	.10***
R^2	.34	.26	.05	.13	.27	.04	.09
F	67.9***	39.7***	4.7***	16.4***	48.7	5.2***	8.4***
Endogneity test[d]	5.89**	1.20	0.58	2.21	0.85	0.67	0.83
N	5363	4459	3830	4397	5233	5520	3504

[a] beta coefficients; * p<0.10; ** p<0.05; *** p<0.01; The number of observations is reported in the last row
[b] Natural log; for effort we used the effort to improve work life balance
[c] Natural log
[d] F test on residuals of effort and measurement, targeting and reporting

Very similar results are obtained for recruitment from disadvantaged groups (e.g. ethnic minorities, people with disabilities, long term unemployed). Again, the effort to increase the share of employees recruited from disadvantaged groups is crucial and mediates most other influences from commitment and output. But also the measurement, targeting and reporting contribute to this social aspect of CSR. Furthermore, size has again a negative effect, indicating that small companies are more involved with this kind of positive discrimination. Companies with a higher skilled labour force are probably less dependent on labour market segments that provide opportunities for employees from disadvantaged groups. Comparing regional effects, hiring people from disadvantaged groups is most popular in Continental Western countries.

The third column reports the estimation results for (the complement of the) share of overtime hours as a % of total FTE's. The results show that a company's effort to improve life work balance leads to a reduction in overtime hours.[47] Commitment and output hardly affects overtime work, which again indicates that the influence on outcome is mediated by implementation. For the control variables, the results show that companies with a relative young working population and companies in the transport service sector make more use of overtime work, whereas companies located in Mediterranean countries make least use of overtime work (which might be due to the deplorable economic situation in these countries in 2010).

For sickness absence we (again) found that the effort to improve work life balance (rather than the effort to reduce work place accidents and/or sickness absence rate) lowers the sickness absence rate. Commitment and output hardly affects sickness absence. Instead, we find

substantial influence from various control variables. First, sickness absence rises with the size of the company, whereas it (unexpectedly) falls with the age of the working population. Furthermore, as expected, it decreases with the share of medium and high skilled labour. Finally, sickness absence is relatively high in East European countries as well as in some manufacturing industries (mining, textile, metal, machine and transport) and relatively low in Scandinavian and Mediterranean countries.

The share of employees covered by collective bargaining is also positively related to the effort to improve social aspects of CSR (measured by the average effort to improve position of women, disadvantaged groups, work life balance and health and safety). Furthermore, we find some but opposite effects of commitment and output. Again, control variables have a major impact. First, as expected, the size of the company has an upward influence on the share of employees covered by collective bargaining. Furthermore, collective bargaining coverage declines with the average level of high skilled employees. There are also important regional differences, companies from Scandinavia, Mediterranean and Continental Western Europe being much more covered by collective bargaining than companies from UK or East Europe. Finally, companies from several manufacturing industries feature relative high collective bargaining coverage.

The share of permanent employment contracts as % of total number of employment contracts is hardly affected by CSR. We find small but contrary effects from internal organization and effort. For the control variables, particular company size is significantly positively related to the share of permanent employment contracts.

Finally, the last column of Table 6.14 reports the results for the number of hours spent on training of employees per fte. Once again, we find that issue specific implementation significantly raises the training of employees. On top of that, we find a significant effect of internal organizational general instruments and an internal code of conduct. As expected, also the skill level has a positive impact on time spent on training. On the other hand, the size of the company has a significant negative effect, indicating that small and very small companies attach a high priority to keeping the human capital of their employees up to date.

Table 6.15 reports the multiple regression analysis of the level of environmental outcomes. Because many companies did not fill in their level of environmental outcomes, the number of observations is relatively low (see the last line of Table 6.15). Table 6.15 shows that environmental outcomes improve if the company puts more effort into using renewable energy, reducing waste production and recycling of waste. For CO2 emissions, energy and water consumption we find no relationship between efforts and outcome. Nor do we find a significant relationship between measurement, targeting and reporting and outcome for CO2, energy and water consumption. This may indicate that there is also reverse causality: companies that have high CO2 emission or energy and water consumption are more prone to put effort to improve, measure, target and report on it because this will reduce their CO2 emission or energy and water consumption in the future (as is shown in Table 6.13). However, if we employ the Hausman endogeneity test, we do not find indications of reverse causation.[48] We find incidentally some effects from commitment and output on outcome, but no clear pattern can be detected. For the control variables we find that, as expected, CO2 emission, energy and water consumption, and waste production are positively related to the size of the company (measured by the number of employees). We also find some regional effects. In particular, companies located in Scandinavia, Mediterranean and continental Europe are more prone to use renewable energy and to recycle

their waste. Finally, there are incidentally significant differences between sectors, like the food sector using relatively more water consumption, whereas recycling of waste is more popular in agriculture, paper and metal industries.

Table 6.15 Multiple regression results: level of environmental outcomes[a]

	CO2, energy and water emissions[b]	Share of renewable energy[c]	Waste production[d]	Recycling of waste
Commitment				
Director answerable	.02	.03	-.01	-.04
Internal code	.08	-.03	-.06***	.00
Public code	-.01	.03	.02	-.01
Global initiatives	.05	.08*	-.01	.01
Output				
External cooperation	.02	.02	-.05***	.01
Internal organization	-.08	.08*	-.02	.04
Environmental certifications	.12**	-.05	-.03	.05
Implementation				
Effort	-.00	.15***	-.10***	.15***
Measurement. targeting & reporting	.11	.07	-.10***	.03
Control variables				
Size	.41***	-.01	.07***	-.05*
Age<25Y	.02	.05	.04***	.02
Age 25-50	.06	.06	.04***	.02
Medium skilled	.05	-.01	.02	-.07***
High skilled	.05	-.01	.01	-.08***
Market leader	.01	.03	-.00	-.02
Follower	-.05	-.01	.01	-.03
Level playing field	-.01	.02	-.01	-.04
B2C	-.01	.03	.01	-.01
Anglo Saxon EU	.03	.06	-.02*	.03
Scandinavia	-.05	.23***	.01	.12***
Mediterranean Europe	-.10	.15**	.02	.22***
Continental Europe	.06	.23***	-.00	.08*
Agriculture	-.01	.06	.02	.06***
Mining	.03	.04	.01	.01
Food	.12*	.01	-.00	.03
Textile	-.10*	.05	-.02*	-.05**
Paper	-.02	.02	-.01	.08***
Oil & Chemical	-.01	-.03	.02	-.02
Metal	-.01	.01	-.02	.13***
Machine	-.05	.05	.01	.02
Transport	.01	-.00	-.02	-.03
Other manufacturing	-.05	.03	-.03**	.00
Electricity, gas & water	.07	.01	.01	.01
Construction	.06	.04	-.02	-.02
Trade & hotels	-.03	-.00	.02	-.00
Transport services	.03	-.03	.01	-.01
Telecommunications	.00	.02	.02	.05*

Finance	-.05	.06	-.01	-.02
Real estate		-.04	.00	-.04*
Other services	-.06	.03	.01	.01
R^2	.45	.14	.06	.11
F	4.3***	2.7***	8.6***	5.8***
Endogeneity test[e]	0.84	0.34	1.24	0.08
N	249	689	5954	2008

[a] beta coefficients; * p<0.10; ** p<0.05; *** p<0.01; The number of observations is reported in the last row
[b] Average of natural log of CO2, energy and water consumption
[c] Calculated as the ratio between use of renewable energy and total energy consumption
[d] Natural log
[e] F test on residuals of effort and measurement, targeting and reporting

6.4.3 Simultaneity bias

In order to identify potential simultaneity between output and implementation and between implementation and outcome, we again employed the Hausman endogeneity test. The test results are reported in Table 6.12-6.15. The test statistics provide no indication of reverse causation from issue specific implementation on output, except for certification, which seems endogenously influence by environmental effort. This may indicate that the respondent interprets certifications as issue specific implementation. Most importantly, we do not detect simultaneity bias between changes in social or environmental outcome and social or environmental implementation. This indicates that the causality runs from output to implementation and from implementation to change in outcomes. Furthermore, for levels of outcomes, we only find evidence of a reverse causation from the outcome of diversity on the implementation of diversity measures. This may indicate that if more women participate in the board of a company, the company will pay more attention to fair opportunities of sexes.

6.4.4 Structural equation model

In order to test the full structure of the model more efficiently, we use structural equation modeling to test the equations simultaneously.

The details of the estimation results are reported in Appendix 2. Overall, the results from the SEM model resemble the results of the regression analysis. We actually see only some differences in regional and sector influences. We therefore conclude that the structural equation model confirms the pattern and relationships that we found in the multiple regression analysis.

Table 6.16 presents reduces form coefficients for most independent variables for environmental and social outcome. This table shows that all commitment and output variables affect social and environmental outcomes positively, when both the direct and indirect are taken into account. Also size has a positive effect on outcomes. For regions we find a mixed picture, with Scandinavian, Mediterranean and continental European companies having relatively favourable social outcomes but unfavourable environmental outcomes.

Table 6.16 Reduced form coefficients of independent variables on outcome[a]

	environmental	social		environmental	social
Commitment			**Control variables**		
Director answerable	.09	.06	Size	.03	.06
Internal code	.07	.05	Age<25Y	-.05	.07
Public code	.03	.03	Age 25-50	-.04	.06
Global initiatives	.05	.01	Medium skilled	.00	.01
Output			High skilled	-.04	.01
External cooperation	.08	.10	Market leader	.01	.01
Internal organization	.03	.09	Follower	.00	.03
Certifications	.08	.01	Level playing field	.00	-.05
Implementation			B2C	.01	.02
Effort environmental	.14		Anglo Saxon EU	.03	.03
Measurement, targeting & reporting environmental	.15		Scandinavia	-.04	.04
Effort social		.15	Mediterranean Europe	-.02	.05
Measurement. targeting & reporting social		.06	Continental Europe	-.03	.06

[a]Calculated by summing up direct effects and indirect effects.

6.4.5 Conclusions

The econometric analysis confirms most of the relationships that are hypothesized in the conceptual model. In all out of 12 cases researched, there is a significant positive association between the company's commitment to CSR and CSR output that integrate CSR in the organizational procedures. The hypothesis that CSR implementation is significantly related to CSR output is also confirmed for all 12 cases researched. Third, in 16 out of 18 cases, a higher level of issue-specific CSR implementation is significantly related to a favourable change in CSR outcomes in the social or environmental dimension between 2007 and 2010. Since commitment and output only incidentally affect CSR outcome directly, this indicates that these influences are largely mediated by issue specific CSR implementation. Finally, if we analyse the level of CSR outcomes, we again find that in ten out of eleven cases, more effort improves CSR outcomes. However, only in one case we find a significant positive effect from issue specific measurement, targeting and reporting (namely for recruitment from disadvantaged groups). This may indicate that formal procedural instruments are less important for SMEs. Although they may have contributed to piecemeal improvements of some companies, measurement, targeting and reporting has not yet influenced the absolute level of CSR outcomes substantially.

For the control variables, we find that the size of the company has a significant positive influence in most relationships: as expected, larger companies show a higher level of CSR output and implementation which indirectly affects CSR outcomes through raising effort and measurement,

targeting and reporting. The influences from region are ambiguous. Whereas companies from Scandinavia, Mediterranean and continental Western Europe perform less than UK and East European countries in terms of output and implementation, we find positive direct effects on outcomes that outbalance these negative indirect effects on outcome through effort.

Finally, tests on causality indicate that reverse causation from implementation on output is limited. We also do not detect reverse causation from the change in social or environmental outcomes on output. For (levels in) outcome we find some reverse causation on implementation of measures to improve diversity. Due to lack of proper instrumental variables, the estimation techniques that we used do not disentangle the possible bi-directional causal influences.

7 ECONOMETRIC ANALYSIS OF IMPACT OF CSR[49]

In 2011, the European Commission presented its renewed strategy for corporate social responsibility, defining the latter as “the responsibility of enterprises for their impacts on society” (European Commission (2011), p.6). With this publication, the Commission emphasizes once more that its CSR supporting policies are an important part of its efforts to achieve a more sustainable Europe and urges businesses to maximize shareholder and stakeholder value while at the same time minimizing negative effects on third parties.

When drafting CSR policies, the link between micro and macro level of the economy is of crucial importance. Predictions regarding outcomes of policies not only for the business level, but ultimately for the economy as a whole are needed for comprehensive economic analyses. These in turn are necessary to guarantee an efficient allocation of resources. The European Commission argues that the European CSR policies are a success, presenting increasing numbers of enterprises which voluntarily signed up for several related initiatives as evidence. Even assuming that CSR shows positive outcomes for participating businesses’ shareholders and stakeholders, said evidence of course falls short, since the final link in the chain from micro CSR effort to enterprises’ performance to macro-economic sustainability outcomes is missing. It could be very well the case that the costs of promoting voluntary CSR are prohibitively high relative to the final outcomes. Moreover, one cannot simply assume that isolated successful CSR measures on the micro-economic level necessarily have a positive influence on related macro-economic indicators. As an example, assume several companies in an industry strategically focus on CSR, thereby increasing internal efficiency and attractiveness of the product to the consumer. It could then be the case that the other members of the industry try to remain competitive via price cuts, yielding efforts to lower costs to the company by maximized offloading on third parties.

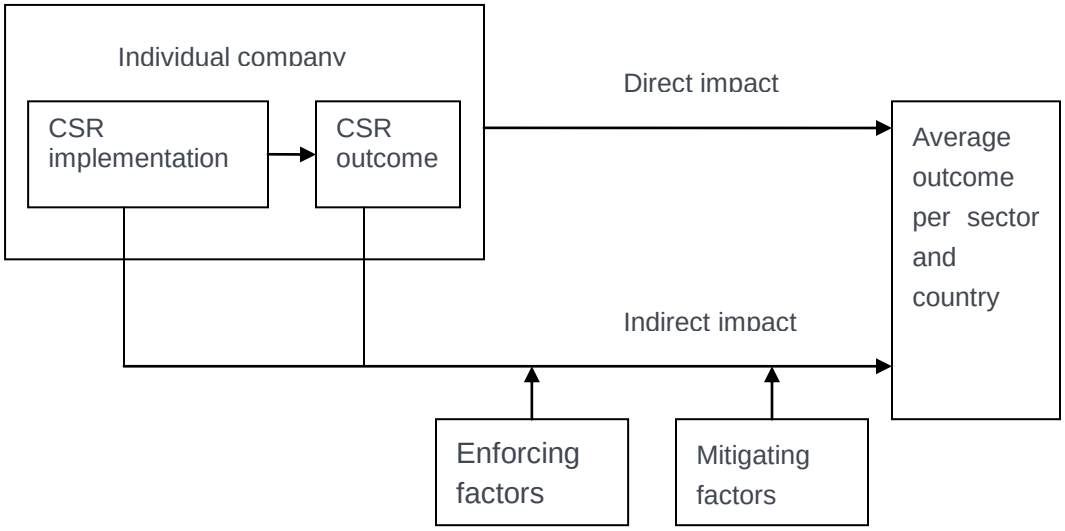
Most research into CSR focus at the business level. Although insight into the potential of CSR at the business level is necessary to gain insight into the role CSR can play as a mechanism that secures EU sustainability goals at the macro level, the exact link between micro and macro remains uncertain. The major research objective of this chapter is therefore to investigate the impacts of CSR on macro sustainability. We focus on two social and two environmental dimensions of macro sustainability: Safety and health, employee training, GHG emissions and energy consumption. The research question is: Do higher levels of CSR at the micro level promote a higher level of safety and health and employee training and a lower level of GHG emissions and energy consumption at the macro level?

The contents of this chapter are as follows. First, we develop a theoretical framework to consider the impacts of CSR at the micro level on the macro level. Next, we present the methodology. In section three we analyse the relationship between environmental CSR ratings and GHG emissions and energy consumption. We first describe the data used. Next, we estimate the influence of micro CSR ratings on meso indices of GHG emissions and energy consumption. In section four we analyse the relationship between social CSR ratings and safety and health and employee training respectively. The last section contains conclusions and limitations to this explorative research.

7.1 Conceptual background

In this section we present a conceptual framework that forms the background of the analysis of (sectoral and regional) impact of CSR (see Figure 7.1)

Figure 7.1 Conceptual framework



CSR implementation and outcomes in individual enterprises can be assumed to influence the associated impact indicators as measured on the sectoral level in two separate ways: through direct impacts and through indirect impacts. The direct impact is defined as the effect that a change in CSR concerning a certain type of variable in an individual company will have on the average of the sector to which the company belongs, merely from its being part of this sectoral aggregate. Indirect impacts, on the other hand, are defined as the effect that a change in CSR of an individual company will have on the average corresponding indicator in the sector to which it belongs on top of the direct impact. That means, by affecting CSR implementation or outcomes and finally impact of other companies. Such indirect impacts arise from the diffusion of CSR conducted in companies into their specific sectors and ultimately the macro environment. These indirect impacts are therefore mediated through what is called 'meta-impacts' in the general IMPACT framework. There are several factors that facilitate or hamper these CSR Impacts. Depending on the net effect of these factors, the overall indirect impact can range from very negative to very positive, but it could also be negligible if they balance each other out. Moreover, these indirect impacts may not only arise from a change in CSR outcome of the company, but also from the CSR implementation an enterprise undertakes. This is because an enterprises' CSR policies and programs might have a signalling effect on its peers, especially if measures are more easily observed than outcomes. Below we describe the indirect impacts in more detail.

7.1.1 Indirect impacts of CSR: analogy with diffusion of technology

The indirect impacts of CSR can be compared with the diffusion of technological innovations between companies. Like innovation, CSR could be regarded as a kind of product or process innovation, because CSR can confer positive attributes to products on the one hand, but could also increase the internal efficiency of the production process. In a report for the European

Commission, Martinuzzi et al. (2010) stress the link between CSR and innovation in the chemical sector, as CSR measures to reduce negative environmental impacts lead to new technologies and vice versa. This is said to be true for all sectors where innovations lead to a large competitive advantage.

Of course one has to be careful not to generalize too much in assuming that innovations and new CSR measures can be analyzed in a similar way, even though their occurrence usually is strongly correlated. One issue here is that while CSR very much relies on transparency, many innovations are only useful if kept secret. Moreover, while radical product innovations by definition lead to new products which can be identified as such relatively easily, radical CSR "product innovations" cannot be readily recognized.

An interesting model that provides insight into the diffusion of socio-technological transitions is the evolutionary multi-level perspective of Geels (2004a,b). Geels explains the occurrence of socio-technological transitions on the macro-economic level, which according to him begin with novelties created on the micro-economic level. His model consists of three analytical levels which make up a nested hierarchy: the micro level, meso-level, and the socio-technical landscape which is typically a very stable macro-environment.

This can also be applied to CSR. New CSR measures are often firstly established within single enterprises. Given the right starting conditions, single companies will start experimenting with new measures of CSR; some forms of CSR will probably at first be considered as an add-on to existing procedures, like the handing out of information regarding safety issues as part of regular training programs. For such a measure to ultimately become noticeable at the macro-economic level, it first has to become predominant in its sectoral environment, since only the regimes under which these sectors operate influence the macro-economic environment. This happens if a niche is created for this new measure with a kind of forum of experts associating themselves with the innovation. This makes it possible for NGOs to police competitors and gives mainstream media access to knowledge on the subject, making coverage possible. Consultancy companies start dealing with CSR, leading to the establishment of best practices and rules, such as certificates that can be used as proof of the application of the CSR measure. These make it feasible for other potential users to pick up the innovation's existence and gauge its impact on the sector as a whole.

7.1.2 Factors that enforce indirect impacts

Once a company has established a new CSR measure, various factors effectively act as multipliers in that they put pressure on enterprises operating in the same sector to imitate their innovative peer, which leads to diffusion of CSR, multiplying the initial direct impact of a single enterprise's CSR outcome.

One of these factors is changes in the socio-technical landscape which put pressure on the meso-level in the CSR context. Examples could be climate change and the resulting focus on sustainability as a societal value. These change preferences of consumers and political decision-makers. This kind of pressure is often motivated by the negative externalities from the company's operations.

Non-adaption to the changes in the socio-technical landscape may result in decreased market shares or profitability. Related to the first factor, an important incentive that facilitates the spread

of CSR innovations is therefore the positive effects that CSR have on the company's reputation and financial performance by reducing costs or improving its market position. If these positive impacts of CSR on a company's reputation and profitability become more known in the market, other companies will try to copy the CSR policies of successful firms. While special CSR measures might be tailored to address the problems of a small subset of firms, when financial incentives are sufficiently strong, competitors will start adopting them as well if they otherwise are in danger of losing market share. With increasing number of users, the network externalities which held the existing regime stable decrease and new externalities are created which benefit enterprises using CSR. The old regime the sector operated under then is gradually replaced by the new regime which uses the CSR measure.

The indirect impacts of CSR innovations also depend on the market characteristics of the company that introduces a CSR innovation. Larger enterprises are more visible and have a higher possibility of leaks, making it easier for competitors to examine and imitate CSR measures. Also the inter-business relationships of a company are important. A proactive CSR-firm might apply certain environmental standards that limit its interactions with non-CSR firms. If the non-CSR firm values the interaction with the CSR-firm enough the threat provides an incentive for the firm to change its behaviour. This will cause the firms that CSR-firms interacts with to adopt CSR and a lower environmental impact. The transmission of CSR to other firms through this channel will be stronger the more market power the CSR firm has. If the firm is a monopoly/monopsony the firms it interacts with have no other options and are more likely to find it profitable to change their behaviour. The less market power a CSR-firm has the more options other firms have and the smaller the incentive. The threat must also be credible. This may mean that it will transmit through the economy in a lagged manner. As a firm should have either a proven track record in environmental CSR, as without this the threat will not be credible and the receiving agent has unchanged expectations about the returns from their current behaviour.

7.1.3 Factors that mitigate indirect impacts

As discussed by Geels (2004a,b), existing socio-technical regimes are stabilized by factors such as rules, regulations, inherent rigidity, and interdependency of actors. These stabilizers mitigate diffusion, as they make it less likely for second-mover enterprises to start conducting CSR measures.

Rules can be cognitive or normative, that is actors acting in ways they are accustomed to (yielding incremental innovations) or in ways expected by society. If an internal problem is believed to be solvable via slight adjustment of current procedures, enterprises will most certainly choose this route. Rigidity may also form expectations of important stakeholders not to bring in radically new procedures. Formal rules and regulations consist of red tape placed by governments and contracts with other enterprises which make radical changes impossible. A more physical stabiliser is the inherent rigidity caused by standardization which is a by-product of the establishment of a socio-technical regime. New components brought into the production process are expected to be compatible with already existing ones, and enterprises are reluctant to change the whole process as well as write off any already existing infrastructure in the first place. Well-known weak points in the infrastructure which are a major cause of accidents and could be avoided with slight modifications of the current infrastructure will persist if these modifications would necessitate replacement of large parts of an enterprise's infrastructure.

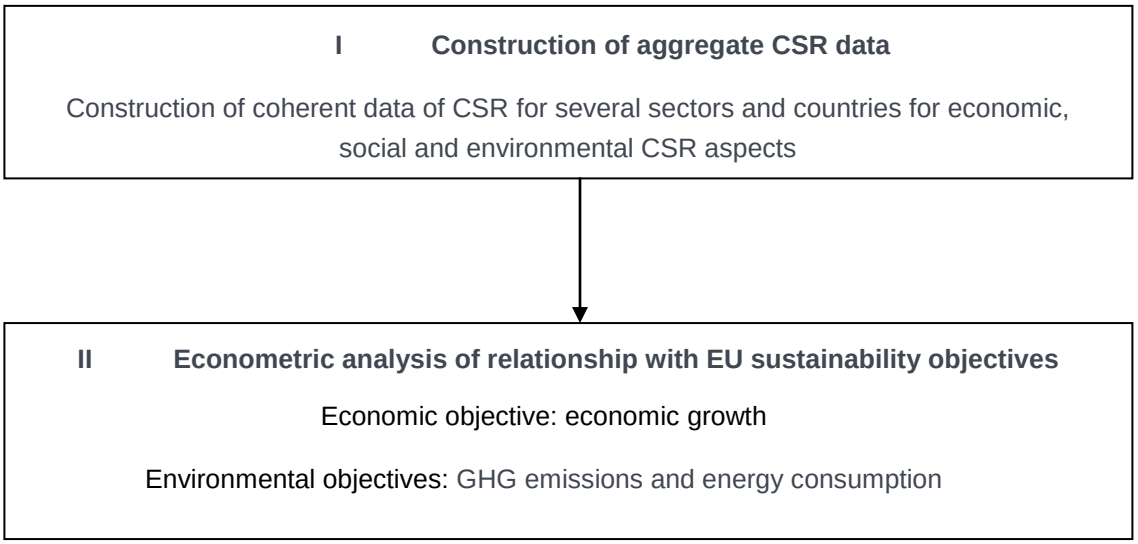
Interdependency of actors is created by organizational networks consisting of the various specialized actors in a production chain, each of which can be expected to have a vested interest in the upholding of the current network. By innovating, an enterprise may be seen by its stakeholders as disturbing this network, if other agents such as subcontractors are neither prepared nor willing to adjust to the first-mover. This effect is smaller the larger the innovating enterprise or the more economic power the enterprise has relative to the agents in its network, since its size and/or economic power increases the amount of (implicit) pressure an enterprise exerts on its stakeholders. Big enterprises like automobile manufacturers are so important for the organizational networks they are in that if they change policies, suppliers of components are effectively forced to adapt.

There is also the possibility of incentives for enterprises prompting them to conduct less CSR when a peer exerts more effort to increase its CSR performance. If a small number of CSR companies gains a large strategic advantage which cannot be overcome, other enterprises then might specialize in conducting business without regard to social responsibility. These incentives constitute a negative indirect impact on the average CSR indicators of the sector or at least the impact on the overall macro environment. Such re-allocation effects are also seen in financial markets. For example, Dam and Heijdra (2011) argue that if investors feel responsible for the social contribution of a company, this places a “tax” on the price of stocks of firms that have a low social contribution. But not all agents are equally responsible. As the authors point out there might be “sin premiums” increasing the value of irresponsible firms. This might have the effect of attracting investment into dirty industries from those who do not care as highly. Additionally, they show that if the overall quality improves, the marginal benefit of CSR is reduced. As a result, there is a reduction in the “tax” reducing the disincentive to investing in dirty industries.

7.2 Methodology

The previous chapter showed that there is a theoretical base for CSR’s impact on sectoral or macro level. In order to assess the impact of CSR performance at the business level on the sustainability goals of the EU, we will perform an econometric analysis linking CSR to sustainability at the meso level more directly (see Figure 1). For this purpose, we develop a data base of aggregate CSR indices for social and environmental CSR for various sectors and countries by weighting the individual companies. This will provide us with aggregate CSR indices for each CSR dimension. Next, we will research the relationship between these aggregates and sustainability data of EU per sector and country in the economic, social and environmental dimension.

Figure 7.1 Linking CSR at business level to EU policy goals



One of the most challenging elements of the empirical analysis into the links between micro and macro levels of sustainability is to find a suitable data set. We only found sectoral data for two social indicators, training of employees and health and safety, and two environmental indicators, CO2 emission and energy consumption, which could be matched with the CSR data. Furthermore, we found that environmental data are available for various periods of time, but that this is not the case for social data. In order to make optimal use of the data available, we therefore used different econometric methodologies, including panel estimation techniques for the analysis of environmental and binary logistic estimation techniques for social indicators.

7.3 Environmental impacts of CSR

In this section we present the empirical analysis for environmental dimensions of CSR. We first describe the dataset. Next we present the estimation results.

7.3.1 Dataset

In order to make optimal use of the data available, we used two data sets. First, we used the environmental data that Asset4 provides regarding the firms' CSR actions and their environmental impact. This dataset represents large companies. An advantage of Asset 4 is that it does not only include data on CSR, but also data on GHG emission and energy consumption. This allows us to empirically test the relationship between CSR and environmental sustainability at the micro level before proceeding with the macro level. Another advantage of Asset4 (which it shares with Sustainalytics) is that it covers data for several periods of time. This allows us to use panel estimation techniques that control for fixed effects. The Asset4 database covers the following European countries: Austria, Belgium, Switzerland, The Czech Republic, Germany, Denmark, Spain, Finland, France, Greece, Hungary, Ireland, Italy, Luxembourg, The Netherlands, Norway, Poland, Portugal and Sweden, over the years 2004-2010. The firms are split into 4 sectors – energy, manufacturing, transport and other services, which are based on the United Nations Framework on Climate Change's (UNFCCC) sector classifications of greenhouse gas

emissions. The weights used for aggregating the data of individual companies were based on company turnover. Observations with zero or negative revenues were dropped. Furthermore, in case we had less than 5 companies per sector and country, we dropped this observation assuming that the aggregate CSR index based on such limited number of companies is not accurate enough.

The second data set we used is the SME survey. For this purpose, we aggregated the data of individual companies for various CSR variables related to GHG emissions and energy consumption, again for the four sectors energy, manufacturing, transport and others services. As weights we used employment (as data on turnover was not reliable enough). We dropped outliers (all companies with size > 500 employees), because large companies are measured by the Asset4 data. This implies that the sector averages obtained by this weighting procedure only reflect the influence of SMEs. If the number of companies per sector and country was below 10, we dropped this observation assuming that the aggregate CSR index based on such limited number of companies is not accurate enough. As a result, we dropped 6 observations of the energy sector. Hence, we have 38 observations for aggregated CSR indices for four sectors in the eleven countries researched in the SME survey.[50]

The firm level data regarding GHG emissions has its macroeconomic equivalent being provided by the European Environmental Protection Agency and its report to the UNFCCC. They publish the amount of GHG emissions produced each year by national sector and total. The submissions are made in accordance with UNFCCC reporting requirements and contains estimates for direct greenhouse gases like carbon dioxide, methane etc.[51] From this report the following sectors can be constructed: energy, transport services, industry (the sum of manufacturing, construction and industrial processes totals) and other services. The remaining sectors are agriculture, residential and institutional sectors that are not covered by the Asset4 database and are left out. Energy use data is provided by sector by Eurostat. For reasons of comparability these data were converted into the same categories as GHG emissions. Economic activity data is measured as gross value added for the four sectors outlined. The data are taken as GVA in 2005 prices, meaning that it is a real value. A detailed description of how each sector (both Asset4 and macroeconomic) was allocated to the sector division used in the econometric analysis is available with the authors.

7.3.2 Descriptives

Table 7.1 presents an overview of the means, standard deviations and minimum and maximum values of the variables used in our analysis.

Table 7.1 Descriptives

variable	description	mean	SD	min.	max.
CSR of SMEs (aggregated at sectoral level)					
CO2 effort	Effort that company puts into reduction of CO2 emissions	.69	.14	.48	.98
CO2 mtr	Company measures, uses target and reports on CO2 emissions	.24	.123	.05	.65
CO2 outcome	Change in CO2 emissions during 2007-2010 (measured by 7 categories)	3.49	.54	1.19	4.98

Energy effort	Effort that company puts into reduction of energy consumption	.75	.13	.43	1.00
Energy mtr	Company measures, uses target and reports on energy consumption	.29	.13	.11	.63
Energy outcome	Change in energy consumption during 2007-2010 (measured by 7 categories)	3.56	.44	2.90	5.13
CSR of Large companies (aggregated at sectoral level)					
Emissions CSR Score	GHG emissions CSR score	19	14	0	61
Energy CSR Score	energy consumption CSR score	17	14	0	58
Dependent variables					
GHG Emissions	The amount of Greenhouse gas emissions emitted by a sector (in teragrams of CO_2e)	161	69	0.6	381.9
Energy Use	The total of all energy consumed by a sector. Measured in petajoules	10230	10200	311	44943
GVA	The sector's Gross Value Added in billions of Euros (In 2005 prices, real terms)	165.7	235.3	4.1	998.6

7.3.3 Empirical analysis of large companies

This section presents the outcomes of the econometric analysis of the environmental impact of CSR on the sectoral level of GHG emissions and energy consumption for large companies.

Before testing this relationship, we first used partial correlation analysis to the relationship between CSR and environmental outcome at the micro level[52]. Because if the methodology that Asset4 uses to generate CSR scores does not have any explanatory power at the micro level, it is highly unlikely that it will have an effect at the macroeconomic level. For GHG emissions and energy consumption, we found a significant bi-variate correlation coefficient (controlling for company size, region and sector) of -0.59 ($p<.01$) respectively -0.69 ($p<.01$). This confirms that a high CSR rating is significantly negatively related to the level of CO2 emission.

Based on this, we proceed by investigating the relationship between CSR and environmental impacts at the sectoral level. Table 7.2 presents the estimation results. The lagged environmental indicator tests for the presence of lagged adjustments regarding a sector's environmental impact. This is because behaviour takes time to change (Antweiler et al, 2001; Managi et al, 2009; Marrero, 2010). We find, however, no significant effect. In contrast, lagged emissions and energy consumption are very significant and negative. The real GVA variables are included as a measurement for the size of the sector, where higher values should be correlated with higher levels of environmental impact (Roca et al, 2001; He and Richard, 2010; Merlevede et al, 2006). Real GVA growth rates are only significantly correlated in the current period. The average CSR scores are the variables of interest, testing for the effects of CSR at the sectoral level. When the dependent variable concerns emissions, the average CSR score is the average emissions CSR score. When the dependent variable concerns energy consumption, the average CSR score is the average energy CSR score. We find that the average CSR score exerts a negative effect on

the growth rates of GHG emissions and energy consumption, indicating that sectors with higher average CSR scores turn away from highly polluting technology and innovate in cleaner technology more often. The interactions of the average CSR score and the sector dummies are to control for possible sector level differences in the effects of CSR, for which the industrial sector forms the base group. We find positive coefficients for the transport sector for both GHG emissions and energy consumption as well as a positive coefficient for the commercial sector for energy consumption, indicating that CSR is hardly effective in reducing the growth in energy consumption in these cases and less effective in reducing emissions for transport. Therefore, only in the industrial and energy sectors does CSR consistently lower energy consumption over time. The long term effects on GHG emissions and energy consumption is substantial: in the long run a one point rise in CSR score from its current mean value (see Table 7.1) would reduce GHG emissions by 1.8% and energy consumption by 0.7% in the industry sector, respectively 2.0% and 0.45% in the energy sector.

Table 7.2 Environmental growth impact of CSR at sectoral level: large companies[a]

	Emissions Growth	Energy Consumption Growth
Lagged Dependent Variable	-0.06	-0.01
Lagged Ln(Emissions)	-75.3***	
Lagged Ln (Energy Consumption)		-47.1***
GVA Growth Rate	0.39***	0.32***
Lagged GVA Growth Rate	0.19	-0.11
Average CSR Score	-0.49**	-0.32**
Lagged Average CSR Score	-0.83**	-0.04
Energy Sector* (Average CSR Score)	-0.13	0.12
Transport Sector* (Average CSR Score)	0.64*	0.35**
Commercial Sector* (Average CSR Score)	0.10	0.31**
Constant	230.8***	418.0***
R-squared	0.52	0.35
F-Test	12.40***	6.15***
Observations	152	150

[a] panel estimation[53]; unstandardized coefficients; *: p<0.10; **: p<.05; ***: p<.01

It should be noted that the estimation results do not provide us direct evidence of indirect impacts. Although the estimation results indicate that CSR has a substantial impact on the macro level, one could interpret these effects as merely indicating direct impacts. This would be the case if the CSR indicators for GHG emissions and energy consumption that we derive from the companies in the Asset4 data base perfectly represent the CSR for these two issues within the whole sector in which these companies are active. As we found in chapter 6 that CSR implementation significantly affect CSR outcome at the individual company level, the estimated relationship in Table 7.2 may just represent these effects at the macro level. However, if our CSR indicators do not perfectly represent the CSR with the whole sector, the estimation results indicate that the CSR of the companies in the Asset4 database also have an indirect impact by stimulating the CSR of other companies within the sector.

The final aspect of CSR's influence on the macro-economy is its effect on the rate of economic growth. According to Aghion and Howitt (2009) CSR has no overall effect on the economic growth rate of the economy. Growth is driven by innovation and once CSR and non-CSR firms have selected what sort of technology they will invest in, they innovate at the same rate as the chosen technology provides the same incentive, leading to the same growth rate.

Table 7.3 Environmental (emissions & energy) CSR and GVA growth rates: large companies[a]

	GVA Growth Rate
Lagged Dependent variable	0.23**
Lagged ln GVA	-68.0***
Average CSR Score	-0.42***
Lagged CSR Score	0.11*
Energy Sector* (Average CSR Score)	0.44**
Transport Sector* (Average CSR Score)	0.28
Commercial Sector* (Average CSR Score)	0.42***
Constant	765.6***
Observations	152
R-Squared	0.40
F-Test	10.25***

[a] panel estimation; unstandardized coefficients; *: p<0.10; **: p<.05; ***: p<.01

To investigate whether this is the case, we performed regression analysis into the relationship between GVA growth and CSR. The estimation results are reported in Table 7.3 The lagged real GVA growth rate has been included to test for lagged adjustments in growth. The lagged level of real GVA of a sector has been included to test for the finding that the more developed a sector is, the slower growth rates are (Solow (1956), Barro & Sala-I_Martin (1992)). Both variables appear significant. Furthermore, the CSR values and their sectoral interactions have again been included. For CSR, we use the average CSR scores for GHG emissions and energy consumption as well as the interaction effects for different sectors. The estimation results show that for industry sector the current period CSR exerts a negative influence on sectoral GVA growth. This may indicate that the sector's attempts at directing technical change at environmental improvements result in less productivity. For the transport sector the long term effect on GVA is almost zero (-.417+.108+.282), whereas for energy and commercial sector the net long term effects are slightly positive (about 0.10), maybe because in these sectors the level of social capital accumulated outweighs the costs imposed today by adopting a more environmentally friendly stance. If we combine all sectoral effects, the CSR impact on economic growth seems rather small.

7.3.4 Empirical analysis of SMEs

In the previous section, we used data for large companies from Asset4. In order to test the macro impact of CSR by SMEs, we performed a similar analysis by using aggregate CSR indices for SMEs. Since the CSR data from the SME survey differ from the CSR data of Asset4, we refrained from constructing an overall data base mixing the two types of CSR data and rather prefer a separate analysis using the SME based CSR indices.

The estimation results are presented in Table 7.4. Because of the small number of observations (38), we did not test for sector specific CSR effects on GHG emissions and energy consumption.[54]

Table 7.4 Environmental growth impact of CSR at sectoral level: SMEs[a]

	CO2 emission	Energy consumption
GVA growth	-0.04	0.14
CO2 effort	-0.06	
CO2 measurement, targeting and reporting	-0.24	
CO2 outcome	0.09	
Energy effort		0.10
Energy measurement, targeting and reporting		0.08
Energy outcome		0.02
Energy	-0.36*	-0.51**
Transport	-0.25	-0.59***
Industry	-0.57***	-0.82***
East Europe	-0.06	-0.06
South Europe	-0.31*	-0.26*
Scandinavia	-0.25	-0.10
N	38	38
R2	0.49	0.66
F	2.65**	5.40***

[a] growth rate between 2007 and 2010; OLS; standardized coefficients; *: p<0.10; **: p<.05; ***: p<.01

Although CO2 measurement, targeting and reporting and CO2 outcome have the right signs, both are insignificant. This may be due to the low number of observations. For energy consumption, the effects of CSR effort and measurement, targeting and reporting are even opposite to what we expected, although insignificant. This may be explained by reverse causation, companies with higher energy consumption having more to win by CSR to reduce the cost of energy consumption. Furthermore, we find significant estimation results for industrial and regional dummies, indicating that GHG emissions and energy consumption are declining relatively more in energy, transport and industrial sector (compared to the other service sector) as well as in South European countries.

Table 7.5 presents the estimation results of GVA growth. All CSR indicators are positively related to GVA growth, but none of them is significant.[55] This may again be due to the low number of observations. Furthermore, note that the causality may be inverse, higher GVA growth causing more CO2 as well as more CSR implementation.

Table 7.5 GVA growth impact of CSR at sectoral level: SMEs[a]

	GVA growth
Ln GVA in 2007	0.63
Average CO2 and energy effort	0.02
Average CO2 and energy measurement, targeting and reporting	0.12
Average CO2 and energy outcome	0.08
Energy	0.37
Transport	-0.01
Industry	-0.49**
East Europe	0.34
South Europe	-0.16
Scandinavia	0.01
N	38
R2	0.42
F	2.03*

[a] growth rate between 2007 and 2010; OLS; standardized coefficients

7.4 Social impacts of CSR

In this section we present the empirical analysis for social dimensions of CSR. Again we first describe the dataset. Next, we present the estimation results.

7.4.1 Dataset

Again we used two data sets, Asset4 for large companies and the SME survey for SMEs. In case we had less than 5 large companies per sector and country in the Asset4 data set, we dropped this observation assuming that the aggregate CSR index based on such limited number of companies is not accurate enough. The weights used for aggregating the data of individual companies were based on employment. For SMEs, we dropped all companies with size > 500 employees. In all sectors, we had more than 10 companies per sector-country cell. Since the SME survey comprises 12 countries and since the data for the dependent variable (see below) allowed a sectoral division into five sectors (manufacturing I including agriculture, mining, paper, textile, and food; manufacturing II including other manufacturing and electricity; construction; main services including trade & hotels, transport services, telecommunications, finance and real estate; and other), we have 60 observations for aggregated CSR indices from the SME survey.

For the dependent variable, we used the 2010 European Working Condition Survey (EWCS) conducted by Eurofound. We selected employees in the private sector, but did not aggregate the micro data into country and sector cells, but rather prefer to use the original micro data. The reason for using the original micro data instead of weighted averages per sector and country is that in this way we substantially increase the number of observations.[56]

7.4.2 Descriptives

Table 7.6 presents an overview of the means, standard deviations and minimum and maximum values of the variables used in our analysis.

Table 7.6 Descriptives

	Min	Max	Mean	SD
CSR of SMEs (aggregated at sectoral level)				
Effort that company puts into training of employees	.66	.95	.82	.07
Company measures, uses target and reports on training of employees	.15	.50	.34	.064
Annual hours of training of employees per fte	13.61	56.35	27.63	9.73
Effort that company puts into reduction of sickness absence	.71	.97	.87	.06
Company measures, uses target and reports on sickness absence	.17	.51	.34	.08
Sickness absence rate (in %)	2.50	12.42	5.34	2.17
CSR of large companies (aggregated at sectoral level)				
Score - Training and Development/Training Hours	11.0	49.8	28.3	9.5
Score - Health & Safety/Injuries	47.1	61.6	53.7	5.3
Score - Health & Safety/Lost Days	29.9	71.3	52.9	13.1
Dependent variables (micro)				
Received training during the last 12 months	0	1	0.304	0.460
Considers health at risk because of job	0	1	0.224	0.417
Yearly absence days b/c of sickness caused by accident at work	0	275	0.881	8.772

7.4.3 Empirical analysis of large companies

This section presents the results of the econometric analysis of the social impact of CSR on the sectoral level of employee training and health and safety for large companies.

Before testing this relationship, we again first used partial correlation analysis for checking whether CSR and social outcomes cohere at the micro level[57]. For training hours per employee, injury rate of employees and lost days the correlation coefficients are, respectively, 0.605 ($p<.01$), -0.826 ($p<.01$) and -0.096 ($p=0.15$), indicating that CSR is significantly related to the corresponding outcome variable except for lost days.

Based on this, we proceed with investigating the relationship between CSR and social impacts at the sectoral level. We also added age and education as control variables. The estimation results are presented in Table 7.7. The estimation results show that for employee training the CSR score has a small but significant positive impact on the number of hours of training received by employees.[58] For health at risk because of job, we find that CSR effort on preventing injuries

tends to lower the health at risk because of job, but the p-value (0.208) indicates no significant relationship between CSR and the sectoral outcome. For the number of absence days, the CSR on lost days is significantly positively related to the sectoral outcome. This might indicate that companies with a high sickness absence put more effort in reducing it.

Table 7.7 Social impact of CSR: large companies

	training [a]	health at risk because of job[a]	Yearly absence days due to sickness caused by accident at work[b]
CSR on training	0.02*		
CSR on injuries		-1.49	
CSR on lost days			0.19***
Manufacturing II	.93***	-7.48	-0.05
Construction	1.17***	-20.30	-0.07***
Main services	0.53***		-0.05
Other			
Spain	-0.29*	2.83*	0.13***
Finland	1.29***		
France	-0.80***	-1.11	0.16***
Germany	-0.23		0.01
Italy	-0.56***	13.06	-0.02
Netherlands	0.22		
Sweden			0.10***
Age	-0.00	0.01	-0.02
Education	0.84***	-0.58***	-0.03*
R^2	0.09	0.04	0.01
Number of observations	3480	2014	3231

[a] binary logistic regression, B coefficients
[b] linear regression; standardized coefficients

Finally, we also tried to estimate the influence of CSR on economic growth, but the number of observations (less than 20) was too low for a reliable test.

7.4.4 Empirical analysis of SMEs

Table 7.8 presents the estimation results for the SMEs. We used the same specification as for large companies.

Table 7.8 shows that CSR is hardly related to the outcomes at sectoral level. For employee training, the CSR related variables are partly significant, but have the wrong sign. For the health at risk because of job, we find not any significant relationship between the CSR of companies and the sectoral outcome. The yearly absence days due to sickness caused by accident at work is

significantly positively related to the CSR outcome of sickness absence, but also the effort to reduce sickness absence is positively correlated. The latter effect indicates that in sectors where sickness absence is high, companies put more effort in trying to reduce sickness absence.

Table 7.8 Social impact of CSR: SMEs

	Training hours per employee[a]	Health at risk because of job[a]	Yearly absence days due to sickness caused by accident at work[b]
Effort	0.24	0.81	0.04***
MTR	-1.39*	0.96	0.01
Outcome	-0.01**	0.02	0.04*
Manufacturing II	0.62***	0.31***	0.02
Construction	0.37***	0.80***	-0.01
Main services	0.37***	-0.31***	-0.03
Other	0.62***	-0.52***	-0.02
Austria	-0.06	0.13	0.01
Denmark	0.17	-0.14	-0.02
Spain	-0.11	0.90***	-0.01
Finland	0.33**	0.76***	0.03*
France	-0.93***	0.77***	0.04*
Germany	-0.33**	0.20	-0.02
Hungary	-0.92***	0.95***	-0.02
Italy	-0.72***	0.04	-0.02
Netherlands	0.21	-0.08	-0.00
Poland	-0.32**	0.73***	0.01
Sweden	0.18	1.48***	-0.01
Age	-0.01**	0.00	0.01
Education	0.74***	-0.71***	-0.04***
R^2	0.09	0.11	0.09
Number of observations	7224	7294	7294

[a] binary logistic regression; B coefficients
[b] linear regression; standardized coefficients

Table 7.9 presents the estimation results for economic growth, again using the same specification as for large companies. Instead of CSR indicators of training and sickness absence, we used the overall social CSR indicators for effort, measurement, targeting and reporting and outcomes. Table 7.9 shows no significant impacts of CSR on GVA growth at the sectoral level. If we drop the

average social effort (because the IVF factor of 4.96 indicates high multicollinearity), the estimation results do not change. Just as we found for the relationship between environmental CSR indicators and GVA growth, the coefficient of measurement, targeting and reporting is actually quite large, but remains insignificant (also after dropping CSR effort).

Table 7.9 GVA growth impact of social CSR at sectoral level: SMEs[a]

	GVA growth
Ln GVA in 2007	-.15
Average social effort	-.06
Average social measurement, targeting and reporting	.17
Average social outcome	.04
Manufacturing I (Agriculture, mining, food, textile & paper)	-.49**
Manufacturing II	-.33*
Construction	-.51*
Main services	.01
Austria	-.16
Denmark	-.20
Spain	-.06
Finland	-.27*
France	-.07
Germany	.04
Hungary	-.19
Italy	-.13
Netherlands	-.03
Poland	.51***
N	54
R2	0.66
F	3.93***

[a] growth rate between 2007 and 2010; UK not included; standardized coefficients

7.5 Conclusions and limitations

Based on our empirical findings, we conclude that there is some empirical support that CSR of large companies affects sustainability at the macro level for the environmental dimension of CSR. For the growth in GHG emissions and for energy consumption, a high level of CSR has a significant effect on the macro level. For economic growth, the evidence is more mixed: For some sectors CSR increases the rate of real GVA growth, for others it reduces it or it has no real impact. Overall, we find little relationship between CSR and economic growth at the sectoral level. For SMEs we do not find evidence of significant impact on macro environmental trends. Although CO2 measurement, targeting and reporting and CO2 outcome have the right signs, both are insignificant. This may be due to the low number of observations. For energy consumption,

the effects of CSR effort and measurement, targeting and reporting are even opposite to what we expected, but the results appear to be insignificant.

For the social dimension, there is no evidence of macro impact of CSR. We find that the CSR of large companies has a small effect on employee training and health at risk, but for sickness absence, we rather find indications for reverse causation: companies that are challenged by high rates of sickness absence will have a stronger incentive to intensify programs on improving health and safety in order to lower the costs of lost days. For SMEs we find that CSR outcomes of sickness absence are, as expected, positively related to the sickness absence at the sectoral level. But for CSR effort the positive sign again indicates that a reverse causality in the sense that companies operating in sectors with high sickness absence tend to spend more effort in reducing sickness absence. For training and health at risk no significant relationships are detected that indicate that CSR has a positive direct or indirect impact on the sectoral level. Finally, we also find no significant relationship between CSR and economic growth at the macro level.

7.6 Limitations

It should be noted that there are several limitations to this study. First, some large firms in our Asset 4 sample highly international companies with activities across the world and the aggregate total of their actions being greater than countries or sectors. This reduces the link between the CSR of these companies and the social indicators in the respective sector – country combination. We partly corrected for this by giving them a lower weight in our weighting procedure, but this is only a very crude correction.

Another problem is that of the firm level reporting. Not all firms have all variables report for every year. This creates gaps, which limit the number of observations that can be generated and reduces the reliability of the CSR scores that we have generated for this macroeconomic study as a representation of the true average level of CSR in a sector.

Measurement errors may also arise because the number of firms used to make average sectoral CSR values varies across sectors and time. This means that the incurably variable construction of the averages may be a source of problems as it is an imprecise measure.

Another problem is the subjective nature of the CSR score, as it could always be argued that these CSR values are not a correct way of measuring CSR. However, this problem may be less acute in our research, because we also tested the relationship between CSR scores and GHG emissions and energy consumption at the micro level and indeed found a strong, significant positive relationship.

Notwithstanding these methodological limitations, this explorative study has indicated that the meta-channels may exist. Therefore, we need a better understanding of how these channels will work. In the future, deeper study and attempts at modelling the transmission mechanisms and meta-channels is needed.

8 CONCLUSIONS

In this chapter we present a summary of the most important findings in our study and the answers to the research questions that we presented in the introduction of this report.

8.1 Chapter 3

Although chapter 3 does not deal itself with an analysis into the main research questions of WP2, it provides insights that are very useful to the overall Impact project. Here we summarize some of the most interesting results. The results for large companies are based on a sample of 212 companies worldwide. For SMEs, the results come from a sample of 5317 companies from 12 European countries.

Perceptions: both large companies and SMEs perceive that their CSR mostly affects their reputation (when compared to profitability, innovation and meeting regulation).

Motivations: There is an important difference in motivation of CSR between SMEs and large companies: whereas strategic motivation is most important for large companies, intrinsic motivation is most important for SMEs.

Time horizon: The time horizon for investments in CSR is very much related to the time horizon used for financial targets. On average, SMEs have a (slightly) shorter time horizon than large companies.

Stakeholder responsiveness to CSR: both large companies and SMEs perceive that the labor market, and particular their own employees, is most sensitive to the CSR of the company. Managers of SMEs state that financers (like banks) do not consider the CSR of the company in their decision to provide credit to their company.

Importance of stakeholder relations: both large companies and SMEs give highest priority to customer relations. Shareholders/owners and employees receive second priority, whereas community and society are considered least important.

Information: Large companies are to a small but significant extent subject to mandatory rules for social and environmental reporting. They perceive that monitoring by NGOs or media is in between significant and substantial. Industrial organizations play a more important role in informing large companies and SMEs about CSR than business schools.

CSR engagement of SMEs: Only 7% of SMEs denied that they engage in CSR. 32% state that they unconsciously engage in CSR, whereas 62% states that they are consciously engaging in CSR. A substantial part of 44% of SMEs started CSR before 2000, indicating that many companies are already known with CSR for a number of years.

Commitment to CSR of SMEs: 2/3 of SMEs state that their director is answerable to CSR issues. Half of SMEs have an internal code of conduct, whereas external codes of conduct are rare.

Output of SMEs: A substantial share of SMEs participate in CSR cooperation in supply chain and CSR local initiatives, provide CSR training to employees and are ISO9001-3 certified. Other CSR

organizational instruments, such as dialogue with NGOs, CSR related remuneration or ISO14001 certification, are relatively rare.

Issue specific implementation of SMEs: safety and health issues and employee training are the most important issues, but improvement of labour conditions in the supply chain is also an important item. Half of SMEs continuously put effort to improve their environmental performance, particular the reduction or recycling of waste. Only a small minority measures CSR performance, defines concrete targets and report on realisation of these targets. For social outcomes, most companies were able to fill in (or guess) their performance. For environmental outcomes, four out of five companies used the option 'Do not know'. This indicates that SMEs organize CSR in a rather loose or informal way.

CSR outcomes for SMEs: social outcomes did not change significantly between 2007 and 2010, but a substantial share of companies report a reduction in energy or water consumption and waste during this period. Overall, there is a slight improvement in all social and environmental aspects.

Voluntariness of changes in social and environmental outcomes: For the companies that realized improvements in social or environmental outcomes, a vast majority indicate that these improvements are due to their own voluntary initiatives. Only in a few cases, collective initiatives in branch or industry or government regulation were perceived as the dominant cause for the changes reported.

8.2 Chapter 4

In this chapter we investigate the quality of ASSET4 and Sustainalytics rating systems by a comparative analysis that unravels the differences and similarities. The main findings can be summarized as follows:

Overall CSR ratings: using cut off values in previous research as a reference, our statistical analysis of the ratings of ASSET4 and Sustainalytics shows that the two ratings correlate more than sufficient and that they measure, at least partially, a part of the same construct.

Correction for weights: Whereas ASSET4 uses a fourth pillar sub-score and equal weights, Sustainalytics uses three pillars and custom weights, which are defined by the industry a firm is in. Correcting for these two differences slightly improves the correlation between the overall CSR ratings.

Sub scores: The social and environmental sub scores of ASSET4 and Sustainalytics show very satisfying correlation coefficients, but for the governance sub-scores correlations are much lower.

Similarity in indicators at disaggregate level: Out of 156 Sustainalytics indicators 63 indicators were found in the ASSET4 dataset that have a similar definition. This implies that there is substantial difference in the exact content of the CSR constructs.

Correlations at disaggregate level: Correlation coefficients between similarly defined indicators at the disaggregate level are far from perfect. This indicates that measurement differences at the lowest level of aggregation partly explain the divergence in the two ratings systems.

Same definitions, no full convergence: When the two rating companies use the similar indicators with similar weights attached to them, they tend to move closer towards each other in 2010 but reach no full convergence.

Transparency: In ASSET4 the construction of CSR scores from CSR values at the disaggregate level of indicators is not transparent. For Sustainalytics, the use of several categories at the disaggregate level of indicators enables measurement of the quality of the respective CSR aspect, but also allows room for more discretionary and subjective judgment than the 0/1 scores that ASSET4 in the construction of CSR values at the disaggregate level.

The result that ASSET4 and Sustainalytics ratings relatively well converge indicates that self regulation is possible. However, there still seems to be a relevant task for the government. First, the government can help rating agencies by mandatory social reporting. Transparency is one of the prerequisites for rating agencies to function well, as they mainly use public information and generally lack the time to get into an intense dialogue with a company. Second, the government can encourage rating agencies to become more transparent, so that clients better know what the raters are actually measuring. This facilitates a mechanism in which clients and other stakeholders can critically judge the raters and could initiate corrective measures. Third, the government could intervene by taking measures to enhance the substantial nature of the ratings. The government could, for example, encourage scientific research to rating agencies, so that the rating methodologies can be made more sophisticated which improves the reliability of the measurement of CSR.

8.3 Chapter 5

Chapter 5 provides insight into the first research question of WP2: What internal and external factors drive CSR in large companies and small companies? Do we find differences for large and small companies and for different sectors and/or countries? Here we shortly summarize the main results.

The econometric analysis of chapter 5 shows that CSR of large companies and SMEs is driven by a multilayered set of institutional, structural and motivational factors. There is a large similarity between large companies and SMEs in the type of factors that drive CSR.

CSR of large companies is largely driven by strategic motivations, such as reputation, profit and innovation. For SMEs, intrinsic motivations such as responsibility and personal satisfaction are relatively more important.

CSR of both large companies and SMEs are, furthermore, (directly and/or indirectly) influenced by a number of variables that characterize the internal and external environment of the company:

Time horizon: the longer the time horizon, the more important benefits from investments in CSR, such as reduction of cost, increase in market share, improvement of reputation, increased access to capital market as well as the impact on social and environmental outcomes which often only materialize after a considerable period of time.

Business culture: companies that combine a flexible management style with external orientation more proactively apply corporate sustainability practices and are most likely to innovate for achieving ecological and social sustainability.

Industrial organizations: industrial organizations providing information on CSR and CSR tools fitting the needs and context of the companies positively influence CSR of their member organizations, particular for SMEs.

Stakeholder responsiveness: The responsiveness of financers, clients and employees react on capital, product and labour markets to the CSR of companies provides companies with an important incentive to improve their CSR.

NGOs and media: monitoring of companies by NGOs and media increases transparency and pressures companies to take measures to prevent social or ecological incidents.

Technological competition: the more intensive technological competition on the output market, the more incentive companies have to pursue an active CSR policy as a means to innovation that distinguishes the companies from other companies, particularly for large companies.

Legal requirement for reporting: For large companies, legal requirements for social and environmental reporting positively influence CSR by raising transparency and the responsiveness of stakeholders on capital, product and labour markets, thereby enforcing strategic motivation of CSR.

Besides these motivational, structural and institutional variables, CSR is also dependent on various other variables that we should control for:

Company size: both for large companies and SMEs, CSR is substantially positively related to company size. Due to a lack of scale and resources and experience, small companies are less able to explicitly recognize CSR issues and less known with important CSR standards.

Market position: for large companies, both market leaders, companies following the market leader and companies operating on a level playing field have a higher CSR rating than companies operating in a niche market. For SMEs only market leaders significantly contribute more to CSR than companies in a niche market.

Position in the chain: SMEs supplying to consumers are slightly more pursuing CSR than SMEs operating in business to business relations. For large companies, the position in the chain does not influence CSR.

Region: The type of region in which the company is located affects CSR of large companies and SMEs in a different way. For large companies, companies located in Scandinavia, Mediterranean countries and continental Europe are significantly more involved with CSR than companies in Anglo-Saxon countries and Asia. For SMEs, companies located in Anglo Saxon countries are more actively pursuing CSR than companies in Scandinavia, Mediterranean Europe, continental Europe or East Europe.

Sectors: The type of sector influences the CSR of companies. Large companies operating in energy, material and industry sector are more actively pursuing CSR than companies in consumer, health, IT and communication and financial sector. For SMEs similar sectoral patterns

are found. In particular, using a more disaggregated sector classification, companies in the food, paper, oil & chemical, metal, other manufacturing, public utilities and construction sector contribute more to CSR than companies in service sectors.

For both large companies and SMEs, CSR is not or hardly influenced by legal motives or the degree of price competition. For SMEs also skill level of employees does not affect CSR.

8.4 Chapter 6

Chapter 6 investigates the second research question of WP2: What is the relationship between various dimensions of CSR commitment and implementation and social, environmental and economic dimensions of CSR performance? Are there differences for large and small companies and for different sectors of industry and different countries?

The econometric analysis in Chapter 6 shows that for large companies CSR commitment fosters CSR output and implementation of CSR for GHG emissions, the use of renewable energy and diversity in the board, and implementation significantly improves the outcomes for these variables. For water consumption, waste production and health and safety issues no significant relationships are found between commitment, output & implementation and outcomes. This provides partial support that CSR commitment and implementation is effective in fostering sustainability at the company level.

For SMEs there is more evidence that CSR commitment (measured by the presence of codes of conduct, CSR accountability of director and membership to CSR initiatives) encourages the output (measured by internal organizational measures, external cooperation and certification) and issue specific implementation (measured by effort, measurement, targeting and reporting) of CSR and that output and implementation foster the change in CSR outcomes, both for environmental aspects of CSR (GHG emissions, energy consumption, water consumption, waste production, use of renewable energy and recycling of waste) and social aspects of CSR (board diversity, recruitment from disadvantaged groups, work life balance, safety and health, collective bargaining, use of permanent contracts). This indicates that CSR is effectively fostering sustainability within the company. For both SMEs and large companies, the results show that the implementation of CSR is a crucial mediator between commitment/output and outcome: without implementation, CSR remains mainly rhetoric.

8.5 Chapter 7

In Chapter 7, we investigate the fourth research question: Can we identify a relationship between aggregate CSR indices and the attainment of EU goals at the sectoral or regional/macro level? A major challenge in this research is to get the appropriate data at the sectoral level. After extensive search, we only found usable data for two environmental parameters (GHG emissions and energy consumption) en two social parameters (training and health/safety). For the environmental sectoral data, we made use of the UNFCCC database for GHG emissions and Eurostat for energy consumption. For the social sectoral data, we made use of data from the European Working Condition Survey (EWCS). For the aggregate CSR indices, we used rating data from ASSET4 for large companies and data from our SME survey for SMEs. Besides environmental and social impacts, we also investigated the influence of CSR on economic growth.

Based on our empirical findings, we conclude that there is some empirical support that CSR of large companies substantially affects sustainability at the macro level for the environmental dimension of CSR. For the growth in GHG emissions and for energy consumption, a high level of CSR has a significant effect on the macro level. For economic growth, the evidence is more mixed: For some sectors CSR increases the rate of real GVA growth, for others it reduces it or it has no real impact. Overall, we find little relationship between CSR and economic growth at the sectoral level. For SMEs we do not find evidence of significant impact on macro environmental trends. Although CO2 measurement, targeting and reporting and CO2 outcome have the right signs, both are insignificant. This may be due to the low number of observations. For energy consumption, the effects of CSR effort and measurement, targeting and reporting are even opposite to what we expected, but the results appear to be insignificant.

For the social dimension, there is no evidence of macro impact of CSR. We find that the CSR of large companies has a small effect on employee training and health at risk, but for sickness absence, we rather find indications for reverse causation: companies that are challenged by high rates of sickness absence will have a stronger incentive to intensify programs on improving health and safety in order to lower the costs of lost days. For SMEs we find that CSR outcomes of sickness absence are, as expected, positively related to the sickness absence at the sectoral level. But for CSR effort the positive sign again indicates a reverse causality in the sense that companies operating in sectors with high sickness absence tend to spend more effort in reducing sickness absence. For training and health at risk no significant relationships are detected that indicate that CSR has a positive direct or indirect impact on the sectoral level. Finally, we also find no significant relationship between CSR and economic growth at the macro level.

APPENDIX 1 COMPARISON OF SUSTAINALYTICS AND KLD[59]

A.1.1 Introduction

Although the main interest in this report is to compare the ESG databases from Sustainalytics and ASSET4, as these are both used in WP2, we also made a comparison between Sustainalytics and KLD. The environmental and social ratings of KLD are among the oldest and most influential ratings and of all the ESG ratings are most often used in scientific papers ((Chatterji and Levine, 2007; Chatterji et al., 2008).

A.1.2 Rating methodology KLD

With respect to the rating methodology used, there are some similarities and differences between KLD and the Sustainalytics methodology (see Chapter 4 for methodology Sustainalytics). As for Sustainalytics, KLD's clients are mainly institutional investors and moneymakers who want to incorporate different aspects of CSR into their investment process (Chatterji and Levine, 2007). In addition, and other than Sustainalytics, many academic researchers have used KLD data and ''scholars generally considered it the standard for measuring corporate social responsibility'' (Chatterji and Levine, 2007). The popularity of the use of KLD data among scientists might be explained by the free availability of their data. Like Sustainalytics, the dataset is published annually. In the beginning of 1991, the first dataset was generated and approximately 650 companies were included (KLD Research & Analytics, Inc., 2006). Only the S&P 500 Index and the Domini 400 Social were evaluated in 1991-2000. In 2001 and 2002 KLD extended the coverage with, respectively, the Russell 1000 Index and the Large Cap Social Index (KLD Research & Analytics, Inc., 2006). The total coverage of KLD was raised to 3000 of US largest companies in 2010 (MSCI, 2011).

Like Sustainalytics, KLD covers the three main categories for the measurement of sustainability, namely environment, social, and governance (ESG). In addition, information about controversial business issues is provided. To get a full profile of the company's performance, the data gathering is performed through several research processes (KLD Research & Analytics, Inc., 2006). According to numerous researchers, ''KLD provides an objective, uniform and systematic assessment of the social behavior of firms'' (Ceton and Liston-Heyes, 2008). The consistency of the evaluations increases because the firm evaluations are performed at the same time every year (Ruf et al., 1998). Furthermore, Ruf et al. (1998) expect the assessments to be consistent among the evaluators because the evaluations are based on objective rules and KLD employs a research staff for this task. Also Sharfman (1996) points out that ''the data are evaluations done by individuals outside the focal firms so they are ostensibly more objective than data gathered via surveys or the content analysis of corporate documents''. KLD works with strengths and concerns to evaluate the different categories. Until 2010, KLD provides a total of 77 strengths and concerns for the different areas of sustainability.

In 2010, MSCI acquired KLD and introduced some significant changes in the KLD methodology (MSCI, 2011). The structure of the rating systems remained the same but the scoring model was adjusted. New indicators were introduced for each ESG category, whereas much more indicators were eliminated. The number of indicators decreased from 77 to 56. This might have improved the reliability of the data, as it takes much effort to investigate the ratings of a large amount of companies, especially when it turns out that the 56 variables are equally capable to determine

the CSR level as the old set of 77 variables. Another explanation for the changes of the ratings could be that with the acquirement of KLD by MSCI the focus of the type of peer group/audience shifted. A different target group can demand different requirements for a CSR rating. MSCI defines its customers more clearly than KLD. It is stated that the clients include ‘‘institutional investors, asset managers, advisers, governments and government agencies, consultants, and NGOs’’ (MSCI, 2012). Furthermore, it is pointed out that the products and services of MSCI ESG Research help institutional investors and asset managers ‘‘to integrate ESG factors into their investment processes’’ (MSCI, 2012).

Unlike Sustainalytics which score companies on indicators from 0-100, the KLD database is simply a binary overview of the positive and negative ratings. When a company meets the criteria for a strength indicator, this strength is ranked with a one. When the company does not meet the criteria, this strength is indicated with a zero. The KLD dataset provides one variable with the summation of strengths and one for the concerns for every category. Unlike Sustainalytics, KLD does not include an overall score for a company. In the empirical part of this appendix we therefore have to consider methods of how to create a composite index for the KLD ratings.

A.1.3 Matching indicators for empirical analysis

To use the same weights to calculate the overall company scores for KLD, the KLD indicators have to be linked to the indicators of Sustainalytics. However, it is not possible to find a comparable indicator for every KLD and/or Sustainalytics indicator. One complication is that the definitions of the KLD indicators (strenghts and concerns) are very extensive. For this reason, it will be likely that multiple Sustainalytics indicators can be allocated to one KLD indicator. Another complication arises from the similarities in the definitions of strengths and concerns. Since some of these indicators have identical definitions, only the strengths in a positive and the concern in a negative approach, various KLD indicators can be linked to one specific Sustainalytics indicator. Because of these complications, there will be a division of the indicators into three kinds of categories. In the first category, KLD indicators can be linked to a specific Sustainalytics indicator or to a range of Sustainalytics indicators. The second category is the group of KLD indicators that cannot be matched with a Sustainalytics indicator. Finally, there is a category of Sustainalytics indicators which cannot be linked to a KLD indicator.

KLD strengths and concerns are connected to core variables of Sustainalytics, but also to sector-specific indicators. For the environmental indicators, only one strength and one concern from KLD could not be linked with an indicator from Sustainalytics. Thus, these subjects are not assessed by Sustainalytics in a comparable way. Remarkably, KLD deletes both these measurements with the methodological changes in 2010. In 2010, all the environmental variables of KLD could be assigned to variables of Sustainalytics and are therefore covered and evaluated by Sustainalytics. Whereas the environmental ratings of KLD have a focus on the company's own operations, the environmental Sustainalytics indicators have a much broader cover of subjects and therefore use many indicators that are missing in the KLD dataset. Besides own operations, Sustainalytics also takes into account the impact on the environment of other parties in the supply chain. For example, Sustainalytics valuates the programmes and targets for environmental improvements of suppliers. Furthermore, there are much more variables concerning the influence of the products or services on the environmental responsibility of the company.

When looking at the social and governance categories, Sustainalytics and KLD are less consistent than in the environmental dimension. Some variables which are categorized in the governance category in Sustainalytics are linked with a strength or concern of a social category in KLD. For example, KLD categorizes the 'amount of women on the board of directors' as part of the social category. On the contrary, Sustainalytics assigned this subject to the theme governance.

With respect to the social dimension, almost all the unlinked KLD indicators of the category social are strengths and they are divided among all the subcategories of social responsibility. In 2010, the number of unlinked variables reduces to seven strengths which are divided into three social subcategories. Of these seven strengths, only one variable is a newly introduced strength with the methodological changes, namely 'Access to Capital' located in the product subcategory. The other unlinked variables of 2008 and 2009 are deleted from the KLD dataset. This information suggests convergence to the definitions of the ratings of Sustainalytics. When looking from the viewpoint of the unlinked variables of Sustainalytics, it can be seen that for 2008 and 2009 KLD has shortcomings in the topics 'Contractors & Supply Chain' and 'Customers'. However, by introducing the strength 'Supply Chain Policies, Programs & Initiatives' and the concern 'Supply Chain Controversies' in 2010, KLD has put some more focus on the similar variables of the topic 'Contractors & Supply Chain' of Sustainalytics.

Most of the KLD governance indicators are covered by Sustainalytics: only the strength and concern 'Ownership' are not connected to an indicator of Sustainalytics in 2008 and 2009. Again, these variables are deleted from the dataset in 2010. In 2010 all the indicators of governance are linked with an indicator. Again, Sustainalytics includes much more (specific) subjects for CSR in the dataset. For example, concerning the board of directors and CEOs: whereas KLD only assesses the composition of the board of directors, Sustainalytics also looks if the board is independent and whether the roles of the CEO and board are separated.

An explanation for differences in the type of indicators and subject coverage between KLD and Sustainalytics could be regional differences in the concept of CSR. Since KLD has a focus on companies from the US, the variables are automatically constructed from a US perspective. Since Sustainalytics has a broader target group regarding the origin of the company, the variables have to be applied to more different countries. Another reason for differences might be the difference in clients of the various raters. This is also suggested by an improved match of indicators since 2010 when MSCI acquired KLD, given the fact that MSCI clients are expected to be more similar to the Sustainalytics clients as explained above.

A.1.4 Datasets and empirical methodology

We use data from KLD and Sustainalytics for 2008 through 2010. The KLD dataset contains 2923 companies for 2008, 2912 companies for 2009, and 2965 companies for 2010. Hence, not for every company data is available for all three years. The companies with missing years are removed from the dataset, resulting in 2683 companies which have data for 2008 through 2012. The original dataset of Sustainalytics for 2008 through 2010 contains 4162 companies. For 1154 companies data is available for all three years and for 3008 companies there is only data for 2010. These 3008 companies are deleted from the dataset. The remaining 1154 companies are registered in 25 different countries. Since the KLD dataset includes only companies from the

United States, we are left with 334 US companies for which we have both Sustainalytics and KLD data.

For 2008 and 2009, there are no missing values for the KLD indicators, but for 2010 there are. The most obvious explanation for these missing values is the methodological changes in that year. Which indicators are missing and the amount of missing indicators vary between the companies and are therefore completely at random. The Sustainalytics data for these years is about complete for most companies.

The convergence between the ratings is expected to improve when the rating methodologies of KLD and Sustainalytics are adjusted for differences and when the consistency in the content of the ratings increases. We therefore expect that similarity between Sustainalytics and KLD will be higher in 2010 compared to 2008 and 2009, as KLD's was made more similar with the Sustainalytics method. We therefore analyse what happens in 2010 by correlating the overall scores as well as the three subcategory scores (environment, social and governance) from KLD and Sustainalytics. As KLD does not calculate an overall score, we use two different methods to create this score for KLD: in the first analyses we use equal weights, in the second we use the Sustainalytics weights. For both analyses, we use bivariate correlation analysis to assess the degree of convergence.

A.1.5 Analysis 1: equal weights

To create the overall score for KLD, the first method mentioned by Sharfman (1996) will be used: the ratings of the three KLD categories will be summed to create the overall score 'KLD1' and there are no weights linked to the ESG categories or indicators. The strengths have a positive influence and the concerns a negative influence on the overall company score and they are valued either zero or one. Since there are 41 strengths and 36 concerns for the years 2008 and 2009, the range of the score is -36 to +41. For 2010 the score can fluctuate from -26 to +30 since the methodological changes reduced the number of variables. We use bivariate correlation analysis to compare this overall score 'KLD1' to the given overall company score of Sustainalytics from the dataset, which is created by using the default weight matrix (see chapter 4 for more information on this matrix). Besides comparing the overall scores, we also compare the scores of the separate ESG categories. Hence, the indicators which are divided by KLD to, for example, the category 'social' are compared to those variables which belong to the social category of Sustainalytics. This will also be done for the categories 'environment' and 'governance'. The variables for the ESG categories will be named 'ENV', 'SOC', and 'GOV' respectively.

As the first row of Table A.1.1 shows, for every year the correlation between 'KLD1' and Sustainalytics is significant. The correlation for 2010 is remarkably stronger than for the years 2008 and 2009. This indicates that the ratings are, on some level, measuring a comparable dimension of CSR. Hence, it can be concluded that there is some convergence between the ratings, especially since 2010.

Table A.1.1 Pearson Correlations between Sustainalytics and KLD: aggregate indices

	2008	**2009**	**2010**
	Sustainalytics		

KLD1	0.397**	0.352**	0.631**
KLD2	0.398**	0.351**	0.621**

** Correlation is significant at the 0.01 level (2-tailed).

Table A.1.2 presents the results from the comparison of category scores. All the correlations are significant. Again, the correlations between the ESG categories are significantly higher in 2010 than 2008 and 2009. Despite the expected higher consistency between the environmental categories, the correlations between the social categories are the strongest for the years 2008 and 2009. In 2010 the highest correlation shifts to the environmental category.

Table A.1.2 Pearson Correlations ESG categories

		2008			**2009**			**2010**		
		Sustainalytics								
		ENV	SOC	GOV	ENV	SOC	GOV	ENV	SOC	GOV
KLD	ENV	0.313**			0.286**			0.594**		
	SOC		0.337**			0.331**			0.405**	
	GOV			0.143**			0.123**			0.354**

** Correlation is significant at the 0.01 level (2-tailed).

The linking of the variables of KLD and Sustainalytics as discussed above clarified that there is inconsistency between the categories social and governance. Thus, the definitions of these categories vary between the ratings. Hence, the rather 'low' correlations between the ratings for 2008 and 2009 could be a sign of inconsistency of the definitions of CSR and/or the methodologies. The methodological changes of KLD increased the consistency for every ESG category since the correlations are remarkably stronger, especially for the environment and governance categories. This increase in correlations as a result of the methodological changes of KLD in 2010, provided an indication of the validity of the rating systems.

A.1.6 Analysis 2: Sustainalytics weights

Several researchers have shown that the KLD categories are not equally important and therefore question the equal weight method used in analysis 1. This conclusion is supported by Graves and Waddock (1997) and Ruf et al. (1998). They create the overall score by multiplying the ratings of every indicator by different weights. To evaluate the relative weights of every CSP attribute, Graves and Waddock (1997) make use of a panel of three experts. They use the average normalized values of the panelists to compute the composite index for the level of CSR. Ruf et al. (1998) utilized the same process and ''the developed indexes are statistically the same'' (Graves and Waddock, 1997). We now mimic this methodology, but not by asking experts directly but by using the default weight matrix of Sustainalytics. This matrix is designed in dialogue with experts and companies. In analysis 2, this matrix is only applied to the ESG level of KLD and therefore only the 'environmental', 'social', and 'governance' categories have different weights in composing the overall company score.

The average weights of the ESG categories vary per peer group. Sustainalytics uses six different ESG weight combinations for the 38 peer groups. The weight combinations are multiplied by the total scores of every ESG category (summation of the strengths and concerns) of KLD. To

calculate the overall score ‘KLD2’, these values are added up for every company. The results of the bivariate correlations of ‘KLD2’ and Sustainalytics scores are shown in Table A.1.1. It becomes clear that the application of the weights to the ESG categories of KLD, which should increase the consistency between the rankings by somewhat reducing the differences in methodology, does not increase the correlation between the rating systems. In conclusion, this step to reduce the changes between the methodologies is not significant enough to increase the convergence between the ratings.

A.1.7 Conclusions

KLD and Sustainalytics use different methodologies to measure ESG for companies. The rating of KLD is originally more focused on scientists than Sustainalytics. The data of Sustainalytics is private information which is sold to investors. KLD’s focus on scientists is confirmed by the fact that, in contrast to Sustainalytics, KLD does not provide an overall company score.

Results of the empirical analyses indicate that there is significant correlation between the rating systems in 2008 and 2009. The reduction in the differences in methodologies by using a weighting procedure for KLD that is more aligned to the weights used by Sustainalytics did not increase the correlation between the ratings. But in 2010, when MSCI acquired KLD, a methodological change of KLD ratings resulted in much more overlap with the ratings of Sustainalytics: there are less unlinked variables of KLD in that year and almost all the new introduced variables could be linked. Most of the variables that could not be linked in 2008 and 2009 have been deleted from the KLD dataset in 2010. As expected, the bivariate correlations between KLD and Sustainalytics scores substantially increase in 2010. So, despite the fact KLD had been the standard for CSR measurement for a long time, the methodological changes in 2010 resulted in a shift to more consistent ratings with Sustainalytics. As MSCI clients can be supposed to be more similar to Sustainalytics clients (namely mainly investors), the main reason of divergence of the former KLD ratings and Sustainalytics might be the difference of CSR conceptualization by different clients groups.

It is recommendable to analyze upcoming years to examine whether the methodological changes in 2010 actually caused structural convergence. It can be questioned if the research period is long enough. Three years may be too short to proper evaluate the consistency between the ratings as the rating systems frequently change the methodologies of the ratings. CSR is a dynamic concept and the definition highly depends on the social standards of the society. Also for the future the social standards will probably change over time, vary between different regions and sectors and could be perceived differently by various types of clients.

APPENDIX 2 SEM MODELS: DETAILED ESTIMATION RESULTS

A.2.1 Drivers of CSR for large companies

In SEM one tests whether the covariance matrix implied by the researchers model sufficiently resembles the sample covariance matrix. The SEM model for the drivers of large companies consists of all the relationships that were tested in the regression analysis. Furthermore, we included covariances between exogenous variables that were found to improve the model fit (at p = 0.05) by looking at the modification indices (treshold of 4). Based on the modification indices, we also added one covariance between the error of strategic motivation and the exogenous variable intrinsic motive. We use AMOS 19 to estimate the model and maximum likelihood as estimation method.

Table A.2.1 Results SEM analysis drivers large companies[a]

	(1)	(2)	(3)	(4)	(5)
	CSR	**Strategic motivation**	**Business culture**	**Info industrial associations**	**Stakeholder responsiveness**
CSR motivation					
Strategic motivation	.22**				
Legal motivation	.06				
Intrinsic motivation	.15				
Internal business environment					
Business culture	-.09	.07 (p=.102)			
Time Horizon	.11*	.04			
External business environment					
Info industry associations	-.02	.12***			
Info business schools	-.11*	.02			
Stakeholder responsiveness	-.09	.29***	.01	.23***	
Background institutions					
Mandatory reporting	.12*	.14***	.03	.09	.26***
NGOs & media	.10 (p=.11)	.05	-.04	.14*	.09
Price competition	-.07	.04	.02	.06	.12*
Technological competition	.17***	.16***	.18**	.05	.19**
Control variables					
Size	.39***	-.01	.00	-.06	.06
Market leader	.22	.42***	.10	.09	.27*
Follower	.25**	.29***	.04	.13	.20
Level playing field	.05	.30***	.06	.16	.12
B2C	.04	-.02	.17**	.21***	-.03
Internationalization	.01	-.01	.08	-.13**	-.02
Financial return	.05	.00	.03	.02	-.05
Anglo Saxon non-EU	.15*	.03	.12	.07	-.17*
Anglo Saxon EU	.07	-.04	.01	.17**	-.14*
Scandinavia	.22***	-.03	.16*	.06	-.16*
Mediterranean Europe	.23***	.16***	.01	.08	.11
Continental Europe	.19*	.10	-.03	.11	-.25**

Energy	.32***	.00	.03	.16	.01
Material	.27***	.08*	.12	.11	.12*
Industry	.24***	-.01	.18**	.09	.15*
Consumer	.08	-.05	.06	-.04	.02
Health	.12*	-.07	.09	-.16**	.07
IT&comm	.18***	-.02	.12	.08	.06

[a] Chi-square =299; df = 249; n=204, p = .017; RMSEA = .031; GFI = .92; CFI = .97; TLI = .95; *: p<0.10; **: p<.05; ***: p<.01[60]

A.2.2 Drivers of CSR for SMEs

We used the same procedure as for the SEM model for the drivers for large companies: the SEM model consists of all the relationships that were tested in the multiple regression analysis. Furthermore, we included covariances between exogenous variables that were found to be improve the fit of the model by looking at the modification indices (treshold of 4). Based on the modification indices, we also added a covariance between the error of strategic motivation, the error of intrinsic motive and legal motivation as well as between the error of intrinsic motivation and legal motivation. The inclusion of a covariance between the error of stakeholder responsiveness and legal motivation would reduce the chi-square value with about 510, but we decided not to include this covariance as this would not be theoretically sound. The various global fit measures suggest a good model fit.

Table A.2.2 Results SEM drivers SMEs[a]

	(1)	(2)	(3)	(4)	(5)	(6)
	CSR	Strategic motivation	Intrinsic motivation	Business culture	Info industrial associations	Stakeholder responsiveness
CSR motivation						
Strategic motivation	.08***					
Legal motivation	.03*					
Intrinsic motivation	.23***					
Internal business environment						
Business culture	.03**	.08***	.20***			
Time Horizon	.08***	.03*	.03**			
External business environment & stakeholder response						
Info industry associations	.06***	.02*	.06***			
Stakeholder responsiveness	.03	.55***	.30***	.12***	.11***	
Background institutions						
NGOs & media	.09***	.12***	.11***	.01	.40***	.28***
Price competition	.01	.00	.00	-.02	.04***	-.01
Technological competition	.03**	.05***	.06***	.09***	.01	.09***
Control variables						
Size	.32***	.08***	.01	-.12***	.10***	.09***
Age<25Y	.05***	.01	.04**	.00	-.04**	.03
Age 25-50Y	.01	.00	.03*	.01	-.03**	.03
Medium skilled	.01	.00	.01	.05***	.00	.02
High skilled	.01	-.01	.06***	.09***	-.02	.08***
Market leader	.05***	.01	.03	-.06***	.00	.07***
Follower	.00	-.01	-.02	-.04**	.01	.05***

Level playing field	-.04	.00	-.01	-.09***	.01	.04**
B2C	.02*	-.02	.02	.00	-.02	.01
Anglo Saxon EU	.04**	.07***	-.04***	.02	.06***	.04**
Scandinavia	-.10***	.06***	-.02	-.02	.08***	.19***
Mediterranean Europe	.01	.09***	.03	-.02	.07***	.19***
Continental Europe	-.07***	.10***	-.08	-.07**	.21***	.20***
Agriculture	.01	.01	-.01	-.04**	.01	.03*
Mining	.01	.01	-.02	-.01	.03**	.00
Food	.03**	-.01	-.03**	-.05***	.02	.03*
Textile	.00	-.01	-.01	.00	.03*	-.02
Paper	.03***	-.02	.00	-.02	.02*	.01
Oil & Chemical	.04***	.02	.01	.00	.04***	.02
Metal	.03*	-.02*	.00	-.04**	.03*	.01
Machine	-.01	-.02	-.02	-.01	.03	.01
Transport	.02	.00	-.02*	-.01	.01	.00
Other manufacturing	.04**	.00	-.01	-.03	.01	.01
Electricity, gas & water	.02	.00	.02	.02	.03*	.00
Construction	.03*	-.02	-.03*	.00	.05***	.02
Trade & hotels	-.01	.00	.02	.01	.00	.02
Transport services	.02	.02*	.00	-.01	.03**	-.01
Telecommunications	-.03**	-.01	-.01	.04**	-.03**	.01
Finance	-.02	-.01	-.01	-.01	.01	-.02
Real estate	-.01	.00	.01	-.01	.01	.01
Other services	-.01	-.01	.03	.02	-.02	-.03

[a] Chi-square =1229; df = 282; n=4414, p = .000; RMSEA = .028; GFI = .99; CFI = .97; TLI = .91; *: p<0.10; **: p<.05; ***: p<.01

A.2.3 CSR performance of large companies

As this model is very complex, we applied a slightly different procedure than we did for the SEM models for the drivers. We first simultaneously model the models that were estimated in the multiple regression analysis and only include the regression paths that were found significant. This implies that paths that were not found significant in the regression analysis are restricted to zero in the SEM model. After estimating the SEM model, we add covariances between exogenous variables by looking at the modification indices. Modification indices show whether dropping a covariance restriction improves the global model fit. When all restrictions on covariances are determined, we add paths that are found to be significant in the SEM model, but not in the multiple regression analysis. The results are reported in Table A.2.3. For the commitment variable, we use data from 2008, for implementation from 2009 and for outcome for 2010. The various global fit measures suggest a good model fit. Regression paths that were added to the SEM model and were not significant in the regression model are reported in red.

Table A.2.3 Results SEM CSR performance of large companies[a]

	output & implementation			
	GHG	Renewable energy	External verification EMS	Program diversity
Commitment				
Membership Global Compact	.08**		.08**	.13***
Formal environmental policy	.18***	.12***	.22***	
Policy on discrimination				.14***
Control variables				

Reporting	.25***	.17***		.08**		.11***
Oversight ESG	.04	.12***				
CSR remuneration						
Whistleblowers program	.06*					
Board independence	-.05*	-.02				-.11***
Size	.35***	.14***		.03		.30***
Energy	.12***	.01		.13***		
Material	.16***			.30***		.10***
Industry	.14**			.26***		
Consumer	.11***	.06*		.17***		
Health	.07**			.11***		
IT&comm	.14***	.10***		.27***		
Anglo Saxon non-EU	.29***			-.17***		
Anglo Saxon EU	.25***			-.03		-.07*
Scandinavia	.15***			.13***		
Mediterranean Europe						-.08**
Other Western Europe	.22***	.06*				
	Outcome					
	GHG intensity	Renewable energy	Diversity	Collective bargaining	Profit	Turnover growth
Commitment						
Membership Global Compact	.06					
Formal environmental policy						
Policy on discrimination			.03		-.11**	.02
Policy on freedom of association				.14***	.09*	
Output&Implementation						
GHG implementation	.30***				.16***	
Renewable energy program		.31***				
External certification EMS	.10***					-.11***
Diversity program			.11***			
Outcome						
GHG intensity					.01	
Renewable energy						
Diversity					.09**	-.08**
Collective bargaining					-.10***	
Control variables						
Reporting		.13***		.14***		
Oversight ESG	.09**		.09***	.03		
CSR remuneration						-.08**
Whistleblowers program			-.09**			
Board independence		.07**	.08**		-.09***	
Size	.00	.12***	.21***	.11***	-.13***	
Energy	-.14***	-.13***		.16***	.12***	.18***
Material	-.13***		-.07**	.20***	.08*	.13***
Industry	-.21***			.13***	.22***	.11***
Consumer	-.27***	-.04	.11***	.13***	.35***	.19***
Health	.05	-.02			.28***	.21***
IT&comm	-.19***			.11***	.26***	.21***
Anglo Saxon non-EU	-.10***	.15***	.75***		.14**	.16**
Anglo Saxon EU		.08**	.25***		.05	.45***
Scandinavia		.13***	.46***	.13***		.15***
Mediterranean Europe			.15***	.29***	.07*	.15***
Continental Western Europe		.17***	.41***	.27***	.03	.26***

[a] Chi-square =346; df = 207; n=718, p = .000; RMSEA = .031; GFI = .97; CFI = .98; TLI = .95; *: p<0.10; **: p<.05; ***: p<.01

A.2.4 CSR performance of SMEs

We applied the same procedure as for the performance model for large companies. The modification indices indicate that we should drop the restrictions on covariances between the errors of the three commitment variables, and between the four implementation variables and two

outcome variables. Table A.2.4 reports regression paths that were added to the SEM model and those that were not significant in the regression model in red.

Table A.2.4 Results for SEM CSR performance of SMEs[a]

	Output			Effort		Measuring, targeting and reporting		Change in outcomes	
	External cooperation	Internal organisation	Certifications	Social	Environmental	Social	Environmental	Total social	Total environment
Commitment									
Director answerable	.25***	.19***	.05***	.09***	.10***	.05***	.05***		.04***
Internal code	.08***	.16***	.13***	.14***	.09***	.11***	.09***		.03*
Public code	.13***	.12***	.11***		.04***		.03**		
Global initiatives	.16***	.33***	.11***			.08***	.11***	-.04***	
Output									
External cooperation				.17***	.14***	.14***	.13***	.07***	.05***
Internal organization				.12***	.07***	.18***	.10***	.06***	
Certifications				.05***	.14***	.07***	.11***		.04**
Implementation									
Effort								.15***	.14***
Measurement. targeting & reporting								.06***	.15***
Control variables									
Size	.17***	.07***	.28***	.11***	.04***	.21***	.16***		-.04**
Age<25Y	.06***	.04***		.01				.05***	-.06***
Age 25-50				.05***	.03**			.05***	-.04***
Medium skilled		.02*	.02	.04***					
High skilled	.05***	.03**		.03**	-.06***		-.04***		-.03*
Market leader	.04***	.02**	.05***		-.01	.03**	.02		
Follower			.03***	-.01	-.01		.01	.03**	
Level playing field							.01	-.05**	
B2C	.09***	.03***	-.09***	.02*	.06***	.02	.03***		
Anglo Saxon EU	-.07***		.01	-.08***	-.03**			.05***	.04***
Scandinavia	-.13***	-.17***	-.11***	-.20***	-.04***	-.03***	-.05***	.10***	
Mediterranean Europe	-.18***	-.06***		-.20***		.11***		.10***	
Continental Europe	-.13***			-.24***	-.11***			.11***	
Agriculture	.02	.01			.02*			.04***	
Mining	.02**								
Food	.02*		.01		.03***		.05***	.03**	
Textile			-.05***						
Paper			.03**		.03***		.02		.04***
Oil & Chemical		.02*	.08***		.02*		.03***		
Metal			.07***		.02	.02**	.04***		.03***
Machine			.05***		-.03***				
Transport							.03***		
Other manufacturing	.03***		.07***	-.02	.03*	.02	.05***		
Electricity, gas & water	.03***			-.02		.03**	.04***		
Construction			.06***	-.01					
Trade & hotels	-.02*		-.05***					.02**	
Transport services									
Telecommunications		-.02*	-.03**		-.05***		-.04**	.03**	
Finance	-.04***		-.07***		-.02	.05***			
Real estate			-.02*				.02*		
Other services	.03**			.03**	-.07***		-.04***		

[a] Chi-square =346; df = 207; n=718, p = .000; RMSEA = .002; GFI = .97; CFI = .98; TLI = .95; *: p<0.10; **: p<.05; ***: p<.01

APPENDIX 3 LINKING SECTOR SPECIFIC INDICATORS IN SUSTAINALYTICS TO PEER GROUPS

Peer groups	Formal policy on working conditions	Programs and targets to reduce health and safety incidents	Health and safety certifications	Programs and targets to reduce water use	Programs and targets to reduce hazardous waste generation	Trend in lost time incidents rate	Number of fatalities	Water intensity	Waste intensity
Aerospace & Defense	X	O	O	X	X	O	O	X	X
Auto Components	X	X	X	X	X	O	X	X	X
Automobiles	X	X	X	X	X	O	X	X	X
Banks	X	X	X	X	X	X	X	X	X
Building Products	O	O	O	O	O	O	O	X	O
Chemicals	X	O	O	O	O	O	O	O	O
Commercial and Professional Services	O	X	X	X	X	X	X	X	X
Construction & Engineering	O	O	O	O	O	O	O	X	O
Construction Materials	X	O	O	O	O	O	O	O	O
Consumer Durables ex Homebuilders	O	O	O	X	X	O	O	X	X
Consumer Services	O	X	X	O	X	X	X	X	X
Containers & Packaging	X	O	X	X	X	O	O	O	O
Diversified Financial Services	X	X	X	X	X	X	X	X	X
Diversified Metals & Mining (incl. Aluminum)	O	X	X	X	X	O	O	X	O
Electrical Equipment	O	X	O	O	O	O	O	X	O
Energy Equipment & Services	X	X	X	X	X	O	O	X	X
Food & Staples Retailing	X	X	X	X	X	X	X	X	X
Food, Beverage & Tobacco	X	X	X	O	X	X	X	O	X
Gold and Precious Metals	O	O	X	O	X	O	O	O	O

Health Care Providers, Equipment & Services	X	O	X	X	O	X	O	X	X
Homebuilders	O	O	O	X	X	O	O	X	X
Household & Personal Products	X	O	O	X	X	O	X	O	O
Industrial Conglomerates	O	X	O	O	O	O	O	X	O
Insurance	X	X	X	X	X	X	X	X	X
Machinery	O	X	O	O	O	O	O	X	O
Media	O	X	X	X	X	X	X	X	X
Oil & Gas Refining, Marketing, Storage & Transportation	X	X	X	X	X	O	O	O	X
Oil, Gas, Coals & Consumable Fuels Producers	X	X	X	X	X	O	O	X	O
Paper & Forest Products	O	O	O	O	O	O	O	O	O
Pharmaceuticals, Biotechnology & Life Sciences	X	O	O	X	O	X	O	O	O
Real Estate	X	X	X	X	X	X	X	X	X
Retailing	O	X	X	X	X	X	X	X	X
Semiconductors & Semiconductor Equipment	O	O	X	O	O	O	X	X	O
Software & Services	X	X	X	X	X	X	X	X	X
Steel	O	O	O	O	X	O	O	O	O
Technology Hardware & Equipment	O	O	X	O	O	O	X	X	O
Telecommunication Services	X	O	O	O	O	O	X	X	O
Textiles, Apparel & Luxury Goods	O	O	O	X	X	O	O	O	X
Trading Companies & Distributors	X	X	X	X	X	O	X	X	X
Transportation	O	O	O	X	X	O	O	X	X

Transportation Infrastructure	X	X	x	x	x	x	x	x	x
Utilities	X	O	o	o	o	o	o	o	o

REFERENCES

Aghion, P. and P. Howitt (2009). *The Economics of Growth*, Cambridge (MA), Massachusetts Institute of Technology.

Albinger, H. and S.J. Freeman (2000). Corporate Social Performance and Attractiveness as an Employer to Different Job Seeking Populations, *Journal of Business Ethics* 28, 243-253.

Allen, Robert F / Hagin, Allan Scott (1989). Scale Related Efficiencies as a (Minor) Source of the Profits-Market Share Relationship. *Review Literature And Arts Of The Americas* 71(3), 523–526.

Ammenberg, J., and O. Hjelm (2003). Tracing business and environmental effects of environmental management systems—a study of networking small and medium-sized enterprises using a joint environmental management system, *Business Strategy and the Environment* 12, 163-174.

Antweiler, W., B. Copeland and S. Taylor (2001). Is free trade good for the environment?, *American economic review* 91(4), 877-908.

Auger, P., P. Burke, T.M. Devinney and J.J. Louviere (2003). What Will Consumers Pay for Social Product Features?, *Journal of Business Ethics* 42, 281-304.

Baliga, B., R. C. Moyer and R. S. Rao (1996). CEO duality and firm performance: what's the fuss?, *Strategic Management Journal* 17, 41-53.

Barro, Robert J., and Xavier Sala-i-Martin (1992). Convergence*, Journal of Political Economy* 100(2), 223–251.

Barth, R. and F. Wolff (eds.) (2008). *Analysing Corporate Social Responsibility in Europe*, Edward Elgar, London.

Berger, I.E., P.H. Cunnigham and M.E. Drumwright (2007). Mainstreaming corporate social responsibility: Developing markets for virtues, *California Management Review* 49, 132-57.

Berman, S. L., A. C. Wicks, S. Kotha and T.M. Jones (1999). Does stakeholder orientation matter? The relationship between stakeholder management models and firm financial performance. *Academy of management Journal* 42(5), 488-506.

Bernard, H.R. (2000). *Social Research Methods: Qualitative and Quantitative Approaches.* London: SAGE.

Beurden P. van and T. Gössling (2008). The Worth of Values – A Literature Review on the Relation Between Corporate Social and Financial Performance, *Journal of Business Ethics* 82, 407-424.

Bollen, K. A. (1989). *Structural Equations with Latent Variables*: Wiley Publications, Inc., New York

Brammer, S.J. and S. Pavelin (2006). Corporate reputation and social performance: The importance of fit. *Journal of Management Studies* 43, 435-55.

Brammer, S, G. Jackson and D. Matten (2012). Corporate social responsibility and institutional theory: new perspectives on private governance, *Socio-Economic Review* 10, 3-28

Brønn, P.S. and D. Vidaver-Cohen (2009). Corporate motives for social initiative: Legitimacy, Sustainability, or the Bottom Line?, *Journal of Business Ethics* 87, 91-109.

Brow n, D.L., A. Vetterlein and A. Roemer – Mahler (2010). Theorizing Transnational Corporations as Social Actors: An Analysis of Corporate Motivations, *Business and Politics* 12, 1-37.

Byrne, Barbara M. (2010). *Structural Equation Modeling with AMOS. Basic Concepts, Applications, and Programming*, Routledge, New York/London.

Campbell, J.L. (2007). Why would corporations behave in socially responsible ways? An institutional theory of corporate social responsibility, *Academy of Management Review* 32, 946-967.

Cañón-de-Francia J. and C. Garcés-Ayerbe (2009). ISO 14001 Environmental certification: A sign valued by the market?, *Environmental Resource Economics* 44, 245-262.

Carrion-Flores, C. and R. Innesb (2010). Environmental Innovation and Environmental Performance. *Journal of Environmental Economics and Management* 59(1), 27-42.

Ceton, G. and C. Liston-Heyes (2008). An investigation of Real Versus Perceived CSP in S&P-500 Firms, *Journal of Business Ethics* 89, 283-296

Chatterji, A. and D. Levine (2008). Imitate or Differentiate? Evaluating the Validity of Corporate Social Responsibility Ratings, *Working Paper Series*, 1-55.

Chatterji, A. and M.W. Toffel (2010). How Firms Respond to Being Rated, *Strategic Management Journal* 31(9), 917-945.

Chatterji, A., A.K. Levine and M.W. Toffel (2010). How Well do Social Ratings Actually Measure Corporate Social Responsibility?, *Journal of Economics & Management Strategy ,* 18 (1), 125-169.

Chollet, P. and A. Cellier (2011). The Impact of Corporate Social Responsibility Rating Announcements on European Stock Prices. *International Conference of the French Finance Association(AFFI).* Paris.

Czarnitzki, D. and K. Kraft (2010). On the profitability of innovative assets, *Applied Economics* 42(15), 1941–1953.

Dalton, D. R., C. M. Daily, A. E. Ellstrand, and J. L. Johnson (1998). Meta-analytic reviews of board composition, leadership structure, and financial performance, *Strategic Management Journal* 19, 269-290.

Dam, L. and B. Heijdra (2011). The environmental and macroeconomic effects of socially responsible investment, *Journal of Economic Dynamics & Control* 35, 1424-1434.

Dubbink, G.W., J.J. Graafland and L. van Liedekerke (2008). CSR: Tansparency and the role of intermediate organisations, *Journal of Business Ethic,* 82, 391-406.

European Commission (2002). European SMEs and social and environmental responsibility, *Observatory of European SMEs*, 4.

European Commission (2011). *Communication from the commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the regions*, (pdf), http://ec.europa.eu/enterprise/policies/sustainable-business/files/csr/new-csr/act_en.pdf, accessed on 24th July 2012.

Fearon, James D. (2003). Ethnic and Cultural Diversity by Country, *Journal of Economic Growth* 8, 195-222.

Filbeck, G. and R.F. Gorman (2004). The relationship between the environmental and financial performance of public utilities, *Environmental and Resource Economics* 29, 137-157.

Finkelstein, S., and R. A. D'Aveni (1994). CEO duality as a double-edged sword: How boards of directors balance entrenchment avoidance and unity of command, *Academy of Management Journal* 37, 1079-1108.

Fligstein, N. (1990). *The transformation of corporate control*. Cambridge: Harvard University Press.

Flören, R.H. (1998). The significance of family business in the Netherlands, *Family Business Review* XI, 121-34.

Francois, P. and J. Roberts (2003). Contracting Productivity Growth, *Review of Economic Studies*, 70, 59-86.

Friedman, A. L., and S. Miles (2001). SMEs and the environment: Two case studies, *Eco-Management and Auditing* 8, 200-209.

Frondel, M., J. Horbach, and K. Rennings (2007). End-of-pipe or cleaner production? An empirical comparison of environmental innovation decisions across OECD countries. *Business Strategy and the Environment* 16,571-584.

Fuj, E.T., M. Hennesy and M. Mak (1985). An Evaluation of the Validity and Reliability of Survey Response Data on Household Electricity Conservation, *Evaluation Review* 9, 93-104.

Fung, A., E. Fagotto, M. Graham and D. Weil (2006). The Effectiveness of Regulatory Disclosure, *Journal of Policy Analysis and Management* XXVI(1), 155–181.

Gatersleben, B., L. Steg and C. Vlek (2002). Measurement and Determinants of Environmentally Significant Consumer Behavior, *Environment and Behavior* 34, 335-362.

Geels, F. (2004a). From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory, *Research Policy*, 33, 897-920. http://dx.doi.org/10.1016/j.respol.2004.01.015

Geels, F. (2004b). *Understanding system innovations: a critical literature review and a conceptual synthesis*. In Elzen et al. (Eds.), *System Innovation and the Transition to Sustainability: Theory, Evidence and Policy*, 19-47, Northampton, Massachusetts: Edward Elgar Publishing, Inc.

Geer, H. de, T. Borglund and M. Frostenson (2010). Reconciling CSR with welfare state actor roles – the problematic Swedish case, *Journal of Business Ethics* 89, 269-83.

Graafland, J.J. (2002). Sourcing ethics in the textile sector: the case of C&A, *Business ethics: A European Review* 11(3), 282-294.

Graafland, J. J., B.W. van de Ven and N.C.G.M. Stoffele (2003). Strategies and instruments for organising CSR by small and large business in the Netherlands, *Journal of Business Ethics* 47, 45-60.

Graafland, J.J. (2004). Collusion, reputation damage and interest in code of conduct: The case of a Dutch construction company, *Business ethics: A European Review* 13(2-3), 127-142.

Graafland, J.J. and H. Smid (2004). Reputation, corporate social responsibility and market regulation, *Tijdschrift voor Economie en Management* XLIX, 269-306.

Graafland, J. and B. van de Ven (2006). Strategic and moral motivation for corporate social responsibility, *Journal of Corporate Citizenship* 22, 111-123.

Graafland, J.J. & C. Mazereeuw-van der Duijn Schouten (2012). Motives for Corporate Social Responsibility, *De Economist* 160, 377-96.

Griffin, J.J. and J.F. Mahon (1997). The corporate social performance and corporate financial performance debate, *Business & Society* 36, 5-31.

Grolin, J. (1998). Corporate legitimacy in risk society: The case of Brent Spar, *Business Strategy and the Environment* 7, 213-222.

Gujarati, D.N. and D.C. Porter (2009). *Basic econometrics*. Boston: McGraw-Hill.

Hair, J. F., R.E. Anderson, R.L. Tatham and W.C. Black (1998). *Multivariate analysis*, Englewood: Prentice Hall International.

Hamilton, J. T. (1995). Pollution as News: Media and Stock Market Reactions to the Toxic Release Inventory Data, *Journal of Environmental Economics and Management* 28 (1), 98-114.

He, J. and P. Richard (2010). Environmental Kuznets curve for CO_2 in Canada, *Ecological Economics* 69 (15), 1083-1093.

Horbach, J. (2008). Determinants of Environmental Innovations – New Evidence from German Panel Data Sorces, in: *Research Policy* 37, 163-173 .

Hu, L.-T. and P.M. Bentler (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives, *Structural Equation Modeling* 6, 1-55.

Hull, C.E. and S. Rothenberg (2008). Firm performance: the interactions of corporate social performance with innovation and industry differentiation, *Strategic Management Journal* 29(7), 781–789.

Jamali, D., M. Zanhour and T. Keshishian (2008). Peculiar strengths and relational attributes of SMEs in the context of CSR, *Journal of Business Ethics*, 87, 355-77.

Jenkins, H. (2009). A 'business opportunity' model of corporate social responsibility for small- and medium-sized enterprises, *Business Ethics: A European Review* 18, 21-36.

Johnson, R. A. and D.W. Greening (1999). The effects of corporate governance and institutional ownership types on corporate social performance, *Academy of Management Journal* 42, 564-576.

Jones, T.M. and A.C. Wicks. (1999). Covergent stakeholder theory, *Academy of Management Review* 24, 206-21.

Joo, T. W. (2003). Trip through the Maze of Corporate Democracy: Shareholder Voice and Management Composition, *A. John's L. Rev.* 77, 735.

Kaptein, M. and J. Wempe (1998). Twelve Gordian knots when developing an organizational code of ethics, *Journal of business ethics* 17(8), 853-869.

Kaptein, M. and F.I. Buiter (2001). *De integere organisatie 2, Handreiking voor een sluitend vangnet van ongewenst gedrag*, Rijswijk: Den Haag Media groep.

Kesner, I. F., and R. B. Johnson (1990). An investigation of the relationship between board composition and stockholder suits, *Strategic Management Journal* 11, 327-336.

Klassen, R. D. and C.P. McLaughlin (1996). The Impact of Environmental Management on Firm Performance, *Management Science* 42 (8), 1199-1214.

KLD Research & Analytics, Inc. (2006). *Getting Started With KLD Stats and KLD's Ratings Definitions.*

Kleinknecht, A., K. van Montfort and E. Brouwer (2002). The non-trivial choice between innovation indicators, *Economics of Innovation and New Technology* 11(2), 109–121.

Kolk, A., and A. Mauser (2002). The evolution of environmental management: from stage models to performance evaluation, *Business Strategy and the Environment* 11, 14-31.

Laudal, T. (2011). Drivers and barriers of CSR and the size and internationalization of firms, *Social Responsibility Journal* 7, 234 – 256.

Lepoutre, J. and H. Heene (2006). Investigating the impact of firms size on small business social responsibility: A critical review, *Journal of Business Ethics* 67, 257-73.

Lin, C. Y. and Y.H. Ho (2011). Determinants of green practice adoption for logistics companies in China, *Journal of business ethics* 98(1), 67-83.

Linnenluecke, M.K. and A. Griffiths (2010). Corporate sustainability and organizational culture, *Journal of World Business* 45, 357–366.

Lioui, A. and Z. Sharma (2012). Environmental corporate social responsibility and financial performance: Disentangling direct and indirect effects, *Ecological Economics* 78, 100–111.

Lougee, B.A. and J.S. Wallace (2008). The Corporate Social Responsibility (CSR) Trend, *Journal of Applied Corporate Finance* 20, 96-108.

Luthar, H.K, R.A. DiBattista and T. Gautschi (1997). Perception of What the Ethical Climate is and What it Should be: The Role of Gender, Academic Status, and Ethical Education, *Journal of Business Ethics* 16(2), 205-217.

Lynch-Wood, G. and D. Williamson (2007). The social licence as a form of regulation for small and medium enterprises, *Journal of Law and Society* 34, 321-41.

MacCallum, R.C., M.W. Browne and H.M. Sugawara (1996). Power analysis and determination of sample size for covariance structure modeling, *Psychological Methods* 51, 201-226.

Managi, S., A. Hibiki and T. Tsurumi (2009). Does trade openness improve environmental quality, *Journal of Environmental Economics and Management* 58, 346-363.

Mankiw, N.G. (2003). *Macroeconomics*, New York: Worth Publishers.

Mares, R. (2003). The Effects of CSR for the Protection of Human Rights, *Mediterranean Journal of Human Rights* 7 (1), 113 – 126.

Margolis, J. D., H.A. Elfenbein and J. Walsh (2007). Does it pay to be good? A meta-analysis and redirection of research on the relationship between corporate social and financial performance. Working Paper, Ross School of Business, University of Michigan.

Marrero, G. (2010). Greenhouse gases emissions, growth and they energy mix in Europe, *Energy Economics* 32(6), 1356-1363.

Martinuzzi, A., S. Gisch-Boie and A. Wiman (2010). Does corporate responsibility pay off?, *Scientific Series of the Research Institute for Managing Sustainability*, http://ec.europa.eu/enterprise/policies/sustainable-business/files/csr/documents/competitiveness/101124_csr_comp_final_report_long_version_final_en.pdf

McMahon, T.F. (1999). From Social Irresponsibility to Social Responsiveness: The Chrysler/Kenosha Plant Closing, *Journal of Business Ethics* 20, 101-111.

McWilliams, A. and D. Siegel (2001). Corporate social responsibility and financial performance: correlation or misspecification?, *Strategic Management Journal* 21, 603-609.

Merlevede, B., T. Verbeke and M. De Clerq (2006). The EKC for SO_2: does firm size matter, *Ecological Economics* 56 (4), 451-461.

Moon, J., A. Crane and D. Matten (2005). Can corporations be citizens? Corporate Citizenship as a Metaphor for Business Participation in Society, *Business Ethics Quarterly,* 15. 427-51.

MSCI (2011). *MSCI ESG STATS*, User guide & ESG Ratings Definition, MSCI ESG Research, June 2011.

MSCI (2012). MSCI – A Clear View of Risk and Return, ESG Research, official website http://www.msci.com/products/esg/about_msci_esg_research.html. Retrieved 12-11-2012.

Murillo, D and J. Lozano (2006). SMEs and CSR: An approach to CSR in their own words, *Journal of Business Ethics* 67, 227-40.

OECD / Eurostat (2005). *Oslo Manual: Guidelines for Collecting and interpreting innovation data*.

Orlitzky, M., F.L. Schmidt and S.L. Rynes (2003). Corporate Social and Financial Performance: A Meta-analysis, *Organization Studies* 24, 403-441.

Orlitzky, M. (2008). Corporate social performance and financial performance. A research synthesis, in A. Crane, A. McWilliams, D. Matten, J. Moon, D.S. Siegel (Eds.), *The Oxford Handbook of Corporate Social Responsibility*, Oxford: Oxford University Press, 113-34.

Padgett, R.C. and J. I. Galan (2010). The Effect of R&D Intensity on Corporate Social Responsibility, *Journal of Business Ethics* 93, 407-418.

Peterson, R.A. (1994). A meta-analysis of Cronbach's coefficient alpha, *Journal of Consumer Research* 21(2), 381-391.

Petts, J., A. Herd, S. Gerrard and C. Horne (1999). The climate and culture of environmental compliance within SMEs, *Business Strategy and the Environment* 8, 14-30.

Podsakoff, P. M., S.B. MacKenzie, J.Y. Lee and N.P. Podsakoff (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies, *Journal of applied psychology* 88(5), 879.

Porter, M. E. and M.R. Kramer (2011). Creating shared value, *Harvard business review* 89(1), 2-19.

Rao, S.M. and B.J. Hamilton III (1996). The Effect of Published Reports of Unethical Conduct on Stock Prices, *Journal of Business Ethics* 15, 1321-1330.

RARE (2006). Rhetoric and realities: Analysing Corporate Social Responsibility in Europe, www.rare-eu.net

Ravenscraft, D.J. (1983). Structure-Profit Relationship at the Line of Business and Industry Level, *The Review of Economics and Statistics* 65(1), 22–31.

Rees, B., and C. Mackenzie (2011). Corporate Social Responsibility and the Open Society, Available at SSRN: http://ssrn.com/abstract=1966030 or http://dx.doi.org/10.2139/ssrn.1966030.

Renneboog, L., J. ter Horst and C. Zhang (2008). The price of ethics and stakeholder governance: the performance of socially responsibility mutual funds, *Journal of Corporate Finance* 14, 203-28.

Robinson, G. and K. Dechant (1997). Building a business case for diversity. *The Academy of Management Executive (1993-2005),* 11(3), 21-31.

Roca, J., E. Padilla, M. Farre and M., Galletto (2010). Economic growth and atmospheric pollution in Spain: Discussing the environmental Kuznets curve hypothesis, *Ecological Economics* 39 (1), 85-99

Romer, P.M. (1990). Endogenous Technological Change. *The Journal of Political Economy* 98(5), S71–S102.

Ruf, B.M., K. Muralidhar and K. Paul (1998). The Development of a Systematic, Aggregate Measure of Corporate Social Performance, *Journal of Management* 24(I), 119-133.

Scharfman, M. (1996). The Construct Validity of the KLD Performance Data Ratings, *Journal of Business Ethics* 15 (3), 287-297.

Schein, E.H. (2004). Organizational Culture and Leadership, 3rd edition, San Francisco, CA: Jossey-Bass.

Schmalensee, R. (1988). Industrial Economics: An Overview, *The Economic Journal* 98, 643–681.

Schmitt, N. (1996). Uses and abuses of coefficient alpha, *Psychology Assessment* 8(4), 350-353.

Schröder, M. (2007). Is there a difference? The performance characteristics of SRI equity indices, *Journal of Business Finance and Accounting* 34, 331-348.

Smith, K. (2005). Measuring Innovation. In: J. Fagerberg, D.C. Mowery and R.R. Nelson (Ed.s) *The Oxford Handbook of Innovation*, New York, 148–177.

Sociaal Economische Raad (2001). *Corporate social responsibility: a Dutch approach*: Uitgeverij Van Gorcum.

Solow, R. (1956). A contribution to the theory of economic growth, *The quarterly Journal of Economics* 70(1), 65-94.

Spence, L.J. (1999). Does size matter? The state of the art in small business ethics, *Business Ethics: A European Review* 8, 163-7.

Spence, L.J., R. Jeurissen and R. Rutherford (2000). Small Business and the environment in the UK and the Netherlands: Toward stakeholder cooperation, *Business Ethics Quarterly* 10, 945-65.

Spence, L.J., R. Schmidpeter and A. Habisch (2003). Assessing social capital: Small and medium sized enterprises in Germany and the UK, *Journal of Business Ethics* 47, 17-29.

Studer, S., R. Welford and P. Hills (2006). Engaging Hong Kong businesses in environmental change: Drivers and barriers, *Business Strategy and the Environment* 15, 416-31.

Telle, K. (2006). It pays to be green" – A premature conclusion?, *Environmental and Resource Economics* 35, 195-220.

Yu, X. (2009). From Passive Beneficiary to Active Stakeholder: Workers' Participation in CSR Movement Against Labor Abuses, *Journal of business ethics* 87, 233-249.

Ulrich, P., Y. Lunau and T. Weber (1998). Ethikmassnahmen in der Unternehmenspraxis, in P. Ulrich und J. Wieland (Eds.), *Unternehmensethik in der Praxis. Impulse aus den USA*, *Deutschland und der Schweiz:* 121-94. Bern: Verlag Paul Haupt.

Vaus, D. A. de. (2001). *Research Design in Social Research,* London: SAGE Publication.

Ven, B.W. van de and R.M.J. Jeurissen (2005). Competing responsibility, *Business Ethics Quarterly* 15, 299-318.

Verspagen, B. (2005). Innovation and Economic Growth, in: J. Fagerberg, D.C. Mowery and R.R. Nelson (Eds.) *Oxford Handbook of Innovation,* New York, 487–513.

Vickers, J. (1995). Concepts of competition, *Oxford Economic Papers* 47, 1-23

Waddock, S.A. and S.B. Graves (1997). The corporate social performance-financial performance link, *Strategic Management Journal* 18, 303-19.

Wagner, M. (2007). On the relationship between environmental management, environmental innovation and patenting: Evidence from German manufacturing firms, *Research Policy* 36(10), 1587-1602.

Warriner, G.K., G.H. McDougall and J.D. Claxton (1984). Any Data or None at All? Living with Inaccuracies in Self-reports of Residential Energy Consumption, *Environment and Behavior* 16, 503-526

Wilbert, C. (2006). Social Responsibility of Coke Questioned, *Atlanta Journal Constitution*, 4.

Williamson, D., G. Lynch-Wood and J. Ramsay (2006). Drivers of environmental behaviour in manufacturing SMEs and the implications for CSR, *Journal of Business Ethics* 67, 317-30.

Wright, B.G. (2000). Environmental NGOs and the Dolphin-Tuna Case, *Environmental Politics* 9, 82-103.

Ziegler A. and J. S. Nogareda (2009). Environmental management systems and technological environmental innovations: Exploring the causal relationship, *Research Policy* 38 (5), 885 - 893.

NOTES

[1] The IMPACT Conceptual Framework has been adapted from an earlier framework developed in the RARE project which analysed the creation of sustainability impacts through CSR (Barth and Wolff 2009).

[2] Please see deliverable D2.1 for the full surveys.

[3] In addition, the SME survey contained 23 detailed questions for respondents from five specific sectors that are studied by WP3, WP4 and WP5 (ICT, automotive, construction, retail and textile).

[4] A sample management system easily transfers into a panel management system which will facilitate data gathering for successive waves, tracking CSR of SMEs over time and more advanced testing of causalities.

[5] Several studies show that self-reported behavior and actual behavior are strongly correlated (see, e.g., Bernard, 2000; Fuj, Hennesy and Mak, 1985; Gatersleben, Steg and Vlek, 2002; Warriner, McDougall and Claxton, 1984).

[6] It should be noted that the scales are not completely comparable, since the perceptions of large companies are

measured on a 5 points scale. For Figure 3.2 we transposed the scale for large companies to the scale of SMEs.

[7] In the GICS classification mining is included in the metal industry, which is part of the materials sector. In the econometric model for large companies, we used a more aggregate classification distinguishing energy (energy and utilities), materials (materials), industry (industrials), consumer (consumer discretionary and consumer staples), IT & telecommunication (information technology and telecommunication services), health care (health care) and finance (finance).

[8] It should be noted that the scales are not completely comparable, since the perceptions of large companies are

measured on a 5 points scale. For Figure 3.2 we transposed the scale for large companies to the scale of SMEs.

[9] In the communication to the SMEs we used the concept of social responsibility instead of corporate social responsibility, as this term is supposed to be more familiar to SMEs.

[10] In order to reduce the number of question, we used in the survey a layered structure of questions to measure the implementation. In particular, if companies responded that they put no effort, subsequent questions regarding measurement, targeting and reporting were not asked.

[11] It should be noted that the outcomes analysed in this chapter have a small overlap with impact as defined in the Impact framework. In particular, since outcomes are defined as changes within

the company and impacts as changes outside the company), there are two variables discussed in this chapter that should be interpreted as impacts rather than as outcomes. These two variables are GHG emissions and waste production. In the remainder of this section, this should be kept in mind.

[12] A bivariate correlation analysis shows no any relationship between the share of permanent contracts and the average tenure of employees.

[13] Or more precisely, the average annual hours of training (course, education) per FTE that the enterprise fully or partly funds. It should be noted that 2% of firms misinterpreted the question and filled in very high numbers. We therefore dropped all companies that filled in more than 400 hours.

[14] However, it should be noted that the response to this question only comprises companies that improved their CSR performance. Companies that did not improve, may prefer legal measures.

[15] We thank Remco van den Heuvel who performed most of the empirical work for this chapter.

[16] Sustainalytics and ASSET4 also use intermediate categories of aggregations, but since there is little overlap between them, we directly jumps to the lowest level of aggregation.

[17] The **MCSI World Index** is a stock market index of 1500 world stocks. This index is often used as a common benchmark for 'world' or 'global' stock funds. The index includes a collection of stocks of all the developed markets in the world, as defined by MSCI. The index includes securities from 23 countries but excludes stocks from emerging economies. The **S&P 500** index comprises the 500 large-cap common stocks traded in the United States. The stocks are publicly held companies that are traded on the NYSE Euronext or the NASDAQ OMX. The **Jantzi Social Index** is a common stock index that consists of 60 Canadian companies that pass a set of broadly based environmental, social, and governance rating criteria. The **AEX** is a Dutch index of the top 25-30 companies.

[18] The number of observations for all three years is lower because of the fact that not all companies are given a peer group reference in the data.

[19] We tested if this improvement in fit is due to the reduction of companies in the comparative analysis, but found that this selection bias is negligible.

[20] The presence of heteroskedasticity can invalidate statistical tests of significance that assume that the modelling errors are uncorrelated and normally distributed. A variable is heteroskedastic if its variance differs for sub-populations. Heteroscedasticity is the absence of homoscedasticity.

[21] For ordinal variables, one should use Spearman's rho or Kendall's Tau as bivariate correlation coefficient. For categorical variables, the Pearson coefficient can be used.

[22] A common statistic used for CFA is Cronbach Alpha.

[23] Like principal component analysis, unweighted least square or maximum likelihood. Moreover, there are several methods of rotation (varimax, oblimin) that facilitate the interpretation of the factors.

[24] A common method for multiple regression analysis is OLS. OLS assumes several characteristics, of which the most well known are: the regression model is linear in the parameters (though not necessarily in the variables); independent variables are not correlated with error term; no heteroskedasticity; no autocorrelation between disturbances; no outliers; no multicollinearity between independent variables; no specification bias.

[25] In order to test for common source bias, we carried out Harman's one-factor test. A factor analysis on 32 variables from the survey revealed 9 factors with eigenvalues greater than 1.0, which together accounted for 62% of the total variance. The largest factor did not account for a majority of the variance (19.7%). This indicates that common source bias is not of great concern. Furthermore, cross plots between CSR and the independent variables showed no heteroskedasticy, whereas box plots indicated only few problematic outliers (one observation for regulation, one for financial motive, three for financial return) which we removed from the sample. Given the fact that our sample is reasonable large, multivariate normality should not pose serious problems. We therefore use OLS for the multiple regression analysis.

[26] We also performed multiple regression analysis on for intrinsic motivation, but found no significant correlations with other variables, which confirms that this variable can be treated as exogenous in the model for large companies.

[27] Estimation results show that time horizon is independent from institutional factors. This confirms that time horizon is an exogenous variable.

[28] For this purpose, we re-estimated the equation of strategic motivation and added the residual from the equation for business culture (column (3) in Table 5.3). We excluded all variables that are also independent variables in the equation of business culture. If the null hypothesis that there is no simultaneity holds, that is, business culture is not endogenous in the strategic motivation equation, the t test on the parameter of the residuals should be insignificant (Gujarati and Porter, 2009: 704). Since we find a t-statistic of 1.21 (well below the critical value of 1.65 at P=0.10), we cannot reject that business culture is exogenous to strategic CSR motivation. Similarly, we re-estimated the equation of CSR (column (1) in Table 5.3) adding the residual from the equation for strategic CSR motivation. The t-statistic of the residual for strategic CSR motivation equals 0.609, which is highly insignificant.

[29] Namely regulation motive, education by business schools, internationalization and financial return.

[30] To address the potential concerns of common source bias, we carried out Harman's one-factor test. An unrotated principal component analysis on all 17 variables (excluding the dummies for sector and country) in our analysis revealed 7 factors with eigenvalues greater than 1.0. The

largest factor did not account for a majority of the variance (20.3 %). This indicates that common source bias is not a major concern for this part of the SME survey. Furthermore, we found no clear outliers that deviate markedly from other observations in our sample, except for the size of the company. But since we use the natural log of the size and since the number of observations is very large, this will not affect our results. Scatter diagrams of CSR performance and each of the independent variables did not indicate heteroskedasticity except, again, for company size. But if we use the natural log of company size, the heteroskedasticity disappears.

[31] An F-test on the parameters of business culture, time horizon, info of industrial associations, stakeholder responsiveness, monitoring by NGOs and media, price competition and technological competition rejects the hypothesis that all variables are insignificant. If we include all these independent variables in the regression analysis, only price competition is not significant (see column (1) of Table 5.6). This indicates that the influences of business culture, time horizon, info of industrial associations, stakeholder responsiveness, monitoring by NGOs and media and technological competition are not fully mediated by CSR response.

[32] For this purpose, we re-estimated the equations of strategic and intrinsic motivation and added the residual from the equation for business culture (and dropping all insignificant control variables). Since we find a t-statistic of 0.395 respectively 1.489 (which is below the critical value of 1.65 at P=0.10), we cannot reject that business culture is exogenous to strategic and intrinsic CSR motivation. Similarly, we re-estimated the equation of CSR (dropping all insignificant control variables) adding the residuals from the equation for strategic and intrinsic CSR motivation. The F-statistic on the joint significance of the residuals for strategic and intrinsic CSR motivation equals 1.773, which is insignificant at p=0.10 (2.33).

[33] Note that the lack of reverse causation from CSR performance on intrinsic motivation invalidates the crowding in effect. Hence, the influence of technological competition on intrinsic motivation cannot be explained by crowding in.

[34] It should be noted that the absolute values of the reduced form coefficients of regional dummies is not completely comparable, because the reference region differs (Asia for large companies, East Europe for SMEs). Therefore, only the relative values can be compared.

[35] We also researched whether the difference may result from differences in the set of independent variables. In particular, in the statistical analysis for large companies we included financial return, information by business schools, mandatory reporting, internationalization and used different sector categories. However, if we drop these variables in the model for large companies the difference in estimates between Anglo Saxon EU and the other European regions did not disappear. Another reason may be that the response rate differs for countries in the SME survey which may influence self selection bias. However, if we include the response rate per country as additional variable, it is highly insignificant (beta=-0.004, p=0.8) and the regional dummies do not change.

[36] There are, however, also studies that falsify this relationship and find no indication of a superior performance of SRI funds or SRI indices (Renneboog, Ter Horst, & Zhang, 2008). Some studies find a neutral or negative relationship (Jones & Wicks, 1999; McWilliams & Siegel, 2000). This also holds more specifically for the environmental dimension of CSR (Cañón-de-Francia & Garcés-Ayerbe, 2009; Filbeck & Gorman, 2004; Telle, 2006).

[37] Sustainalytics also rates the Quality and comprehensiveness of a company's Environmental Management System. However, since this variable comprises both policies and use of programs, it includes elements of both commitment, output and implementation and therefore cannot be used in our analysis.

[38] Sustainalytics uses the methodology developed by the Greenhouse Gas Protocol to categorize greenhouse gas (GHG) emissions. The GHG Protocol distinguishes three categories of emissions: Scope 1 : All direct GHG emissions (e.g. emissions from combustion of fossil fuels); Scope 2 : Indirect GHG emissions from consumption of purchased electricity, heat or steam; Scope 3 : Other indirect emissions not covered by Scope 2 (e.g. emissions from the use of products and in the supply chain). Direct emissions are emissions from sources that are owned or controlled by the reporting entity. Indirect GHG emissions are emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity. Green house gases include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulphur hexafluoride (SF6), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs).

[39] The use of two year averages reduces the impact of possible accounting inconsistencies (Johnson & Greening, 1999).

[40] A detailed look into the definition of categories distinguished for this variable indicates that the result should be interpreted as indicating the committees are on average below board level.

[41] See Chapter 3 for definitions.

[42] To measure the independence of directors, we use five different indicators.: board independence (independence of Supervisory Board members for two-tier boards, or, the independence of Board of Directors members for one-tier boards), audit committee independence, compensation committee independence, 'Non audit fees audit fees' (assessing the ratio between formal and informal fees for auditors) and CEO duality (Positions of Chairman of the Board and CEO are combined or not. Separation has higher score. Outside director representation have been found to be positively related with the social dimension of CSR (Johnson and Greening 1999; Kesner and Johnson 1990). Furthermore, CEO duality might create a unity of command that can enable the CEO to act quick and decisively (Finkelstein and D'Aveni 1994). This might increase the likelihood of good CSR policies in the company, because CSR commitment is generally expected to be better when the responsibility is concentrated at the top. Empirical studies are, however, not conclusive about the influence of CEO duality on social outcomes (Baliga, Moyer and Rao 1996; Dalton, Daily, Ellstrand and Johnson 1998).

[43] To address the potential concerns of common source bias, we carried out Harman's one-factor test. An unrotated principal component analysis on all 20 variables (excluding the dummies for sector and country) in our analysis revealed 6 factors with eigenvalues greater than 1.0. The largest factor did not account for a majority of the variance (22.5%). This indicates that common source bias is not a major concern. Furthermore, we found no clear outliers that deviate markedly from other observations in our sample, except for ROE and turnover growth. By examining the Stem-and-Leaf plot, we delete 64 extreme values for ROE and 111 extreme values for turnover growth. Scatter diagrams of CSR performance and each of the independent variables did not indicate heteroskedasticity.

[44] To address the potential concerns of common source bias, we carried out Harman's one-factor test. An unrotated principal component analysis on all 60 variables (excluding the dummies for sector and country) in our analysis revealed 21 factors with eigenvalues greater than 1.0. The largest factor did not account for a majority of the variance (14.4 %). This indicates that common source bias is not a major concern for this part of the SME survey. Furthermore, we found some outliers that deviate markedly from other observations in our sample for the (absolute level of) recruitment from disadvantaged groups, number of overtime hours, sickness absence rate, training per fte, CO2 emission, water and energy consumption, share of renewable energy, waste production and the size of the company. But if we use the natural log of overtime hours, sickness absence rate, CO2 emission, water and energy consumption waste production and size of the company no clear outliers were the size and since the number of observations is very large, no clear outliers were observed for these variables. For recruitment from disadvantaged groups, training per fte and share of renewable energy we dropped outliers using a maximum of 30% respectively 400 hours training per fte and 1.0 for the share of renewable energy. Scatter diagrams for relationships where heteroskedasticity is most likely to occur confirmed homoskedasticity for all relations.

[45] The EFA was performed by a principle component analysis with Oblimin rotation. Within these factors, we retained individual items if its loading was greater than 0.50, because these are considered to be very significant (Hair et al., 1998).

[46] Defined as {(RSSr-RSSur) / m} / { RSSur / (n-k)}, where RSSr and RSSur denote sum of squares of residuals of restricted respectively unrestricted equation, m the number of restrictions and n-k the degrees of freedom (Gujarati and Porter,2009, p. 250).

[47] However, measurement, targeting and reporting seems to have an opposite effect. Probably this points at multicollinearity with effort.

[48] If we add the residuals for certification and the average effort and measurement, targeting and reporting for CO2, energy use and water consumption, the t-values are 0.29, 0.38 and 0.51 respectively.

[49] We thank Paul Hudson and Jonas Werner for their empirical work on the environmental respectively social impact analysis.

[50] We did not include the UK, because Eurostats does not publish sectoral data on GVA for UK.

[51] For more information, see http://unfccc.int/ghg_data/ghg_data_unfccc/items/4146.php

[52] For SMEs, this has already been researched in chapter 6.

[53] The panel estimation technique allows estimation of fixed effects that control for the heterogeneity in sectors, countries etc., as they remain constant over time. The fixed effects estimation technique generates a constant that is the average size of the fixed effects. The fixed effects appear to be statistically significant, implying that fixed effects across nations and sectors have a strong influence over the level of a sector's environmental impact.

[54] As the IVF factor of lagged CO2 emission exceeds the maximum value of 5 (and since it is insignificant), we dropped this variable. This did not change the estimation results for the CSR related variables. For lagged energy consumption, the IVF factor was just below 5, but since this variable was highly insignificant, we also dropped this variable. All CSR related variables had IVF factors lower than 5.

[55] For all CSR variables, the IVF factor was below the critical value of 5, so there was no need to drop one of them because of too much multicollinearity.

[56] Because of the binary character of these micro data, we use binairy logistic regression (and multinomial logistic regression for variables with three discrete values).

[57] For SMEs, this has already been researched in chapter 6.

[58] In a binary logistic estimation, the input can vary from negative infinity to positive infinity, whereas the output (for example, the probability of receiving training) can only vary between 0 and 1. In formula: $\ln(\pi(x) / (1-\pi(x)) = \beta_0 + \beta_1 x$, where π denotes the probability of y happening and x the independent variable. In the table, we report the estimated β_1. The relative change in the odds that y=1 (defined as [P(Y=1, after change in predictor) / P (Y=0 after change in predictor)] / [P(Y=1) / P (Y=0)] is equal to exp (β_1). For training, the coefficient of 0.019 implies that if the CSR of training increases with one unit, the relative change in the odds that an employee receives training increases by 1.019. See http://cnx.org/content/m34543/latest/

[59] We thank Kiki Luijkx who performed most of the empirical work for this appendix.

[60] See Table A4.1. The chi-square value indicates the difference between the model implied covariance matrix and the sample covariance matrix. The Goodness-of-Fit Index (GFI) and the Comparative Fit Index (CFI) measures range from 0 to 1.00. Values larger than .95 are generally seen as confirming a good model fit (Byrne, 2010). The same is true for the Tucker-Lewis Index (TLI), an index that includes a penalty function for overparametrization. The values of all these indices for our model therefore suggest a good model fit. Good model fit is also confirmed by the RMSEA measure, because it has a value smaller than .06 (MacCallum et al, 1996; Hu and Bentler, 1999). Only the chi-square value is not insignificant, which indicates that we have to

reject the hypothesis that the model has a perfect fit in the population. Although normally a significant chi-square value indicates a poor fitting model, the chi-square value is sensitive to sample size. As our sample is relatively large (n=204) and also the other fitting measures are good, we can say in overall that our model has a good fit.