Towards a more sustainable society: proposing a framework that determines how firms can contribute to this development

Grasping data on corporate sustainability performance

Radboud Universiteit

Name:	Corine Somers
Student number:	S1011388
Email:	csomers@student.ru.nl

Master:	Business administration
Specialization:	Strategic Management

Supervisor:	S. Witjes
Second examiner:	R. ten Bos

Date:	17-06-2020
Version:	1.0

Wordcount: 8302

Content

List of tables

List of figures

Abstract

Sustainable development is an increasingly important concern for business managers, as planet earth will lose its ability to provide the necessary resources and conditions to meet current and future generations. Firms play a vital role in the transition towards a more sustainable society, as firms use a significant part of the necessary resources within their business activities. The aim of this research is to examine the link between firm performance indicators and the development towards a more sustainable society. This research adopted a mixed method approach using quantitative data to examine the aforementioned link and qualitative data to validate the quantitative results with practice. Data on firm performance indicators were obtained through the ASSET4 dataset and data on the sustainability of a society were obtained through the SSI dataset. Multiple regression analyses were performed for the years 2006, 2011 and 2016 on data of resp. 579, 783 and 971 listed firms in Europe. The findings show that firm performance indicators contribute very little to the development towards a more sustainable society. These findings indicate that concepts like corporate sustainability (CS) and resource-based view (RBV) are not in line with the development towards a sustainable society. Therefore, a new framework of shared value creation of socially responsible firms for the development of a sustainable society is proposed. The development towards a sustainable society is not focused on achieving a particular end results or output, but rather a stepwise development process towards a sustainable society which creates impact. This process requires extensive coordination and collaboration between firms and sectors in which knowledge creation and innovation are stimulated. In this way, firms can create shared value and restore the balance in which planet earth is able to provide the necessary resources and conditions to meet the needs of current and future generations.

Keywords: strategic sustainable development, FSSD, corporate sustainability performance, performance indicators, listed firms in Europe

1. Introduction

Firms play an important role in making societies more sustainable by reducing the environmental and social degradation resulting from their activities and thereby contributing to sustainable development (Broman & Robèrt, 2017; Chang et al., 2017; Hahn & Scheermesser, 2006). This key role of firms has led to the development of the concept of corporate sustainability (Dyllick & Hockerts, 2002). Corporate sustainability (CS) refers to firm "activities that proactively seek to contribute to sustainability equilibria, including the economic, environmental and social dimensions, of today and of future generations" (Lozano, 2015, p. 33; Van Marrewijk & Werre, 2003, p. 107). CS focus on the application of sustainable development at the corporate level (Ike, Donovan, Topple, & Masli, 2019; Schrippe & Ribeiro, 2019), including the short and long term environmental and social performance of a firm (Ashrafi, Adams, Walker, & Magnan, 2018; Küçükbay & Sürücü, 2019). Some scholars have taken a resource-based view (RBV) to understand how firms deal with corporate sustainability (Bansal, 2005; Cardoni, Kiseleva, & Taticchi, 2020; Montiel & Delgado-Ceballos, 2014). The RBV focus on how resources and capabilities are exploited through business activities in order to achieve superior firm performance (Alvarez & Barney, 2007; Barney, 1991). Studies have found that effective use of resources and capabilities and investment in the development of value creating activities is the source of creating superior firm performance (Jafari & Rezaee, 2014; Lozano, Carpenter, & Huisingh, 2015; Sambasivan, Bah, & Jo-Ann, 2013). So, where CS views the environmental and social impact of business activities, the RBV in a broader context can be seen as an important perspective to understand how firms' function and achieve superior performance through the exploitation of resources and capabilities.

Although considerable research has been conducted to corporate sustainability (see e.g. Büyüközkan & Karabulut, 2018; Montiel & Delgado-Ceballos, 2014; Morioka & de Carvalho, 2016), rather less attention has been paid to knowing whether firms contribute to a more sustainable society (Baumgartner & Ebner, 2010; Eccles & Serafeim, 2011; Joshi & Li, 2016; Moon, 2007). The framework for strategic sustainable development (FSSD) is one of the proposals to address the social-ecological impact of business activities on society (Baumgartner & Ebner, 2010; Jones & Comfort, 2019; Robèrt, 2002). Future-fit-business benchmark (FFBB) and the Sustainable Development Goals (SDG) are other examples which address the impact of firms on society (Aagaard, 2018). In this research, however, the FSSD approach is chosen because this approach is scientifically substantiated and results from a 25-year learning process between scientists and practitioners (Broman & Robèrt, 2017). Over the years, the FSSD has also proven to help firms reduce their negative impact on the socio-ecological system by providing robust sustainability principles, while at the same time providing proactive strategic guidelines, including a logical and practical methodology for moving towards a sustainable society (Robèrt, Broman, & Basile, 2013).

A sustainable society does not systematically degrade ecological and social systems (Broman & Robèrt, 2017). Drawing on the RBV, a firm must contribute with its performance to a sustainable society by effectively use the scarce resources available from Earth crust while at the same time maintaining a healthy society (da Cunha Bezerra, Gohr, & Morioka, 2020; da Silva & Bitencourt, 2018; Hart & Dowell, 2010; Shi, Han, Yang, & Gao, 2019). However, no quantitative research has yet been conducted on how firm performance is related to contributing to a more sustainable society. With the growing concern about current environmental and social boundaries being passed by firm activities (Leszczynska, 2012; Sartori, Witjes, & Campos, 2017), in a world where data is collected and available with the potential to show pluriversal perspectives on the performance of firms (Song et al., 2017; Woo, Shin, & Seo, 2016; K.-J. Wu et al., 2017), there is a need for knowing if or not firms are contributing to a more sustainable society (Eccles & Serafeim, 2011).

The aim of this research is to contribute to the sustainable development literature by proposing a framework that determines how firms can contribute to the development towards a more sustainable society. The following research question has been formulated: "To what extent can the performance indicators of firms be linked to the development of a more sustainable society"? This research provides academics and practitioners with insights in strategic choices by quantifying the contribution of firms to a sustainable society. The insights will help firms to realize a sustainable society through their own business activities. This research is structured as followed. Section 2 proposes a framework for corporate sustainable RBV that links RBV and the development towards a more sustainable society. Section 3 describes the characteristics of the ASSET4 and SSI dataset and discusses why a multiple regression analysis is the best way to analyse the relationship between corporate sustainability performance and sustainable society. Section 4 reports the empirical findings. Finally, section 5 discusses why the CS RBV framework is not in line with the development towards a sustainable society and therefore proposes a different framework based on social corporate responsibility (CSR) and creating shared value (CSV).

2. A corporate sustainability resource-based view

2.1 The sustainability challenge

Planet earth itself is completely sustainable and in balance. Human development and the growth of destructive actions by firms in society have led to negative impacts on planet earth (Steffen, Grinevald, Crutzen, & McNeill, 2011). Society therefore faces a systematic challenges in the field of sustainability (Ny, MacDonald, Broman, Yamamoto, & Robért, 2006). Examples include increasing CO2 emissions caused by the burning of fossil fuels and industrial production (Wang, Li, Fang, & Zhou, 2016), systematic increase of pollution and manmade chemicals in the natural world (Mishra, Mohammad, & Roychoudhury, 2016) and destruction of natural habitats by physical means such as over-harvesting and growth of infrastructure (Robèrt et al., 2004). Further, social systems are systematically degraded by inequality and an erosion of trust within society (Gustavsson & Jordahl, 2008; Missimer, Robèrt, & Broman, 2017a, 2017b). In summary, these main causes of unsustainability have led to unbalanced socio-ecological system in which planet earth will lose its ability to provide the necessary resources and conditions to meet (future) generations needs as waste builds up and resources decline (Colldahl, Frey, & Kelemen, 2013; Robèrt et al., 2004).

This ongoing loss of the ability of the socio-ecological system can be conceptualized as society moving deeper and deeper into a funnel, implying unsustainability (see fig 1) (França, Broman, Robèrt, Basile, & Trygg, 2017). The narrowing walls represent the continuously degrading socio-ecological system, through resource depletion, destruction of ecosystems and social conflicts, caused by society's unsustainable activities (Colldahl et al., 2013; Dahlmann, Branicki, & Brammer, 2019; Utz, 2019). As the funnel narrows there are fewer resources available to fulfil human needs and there is less room to manoeuvre (Broman & Robèrt, 2017). The challenge is to open the walls of the funnel by developing a sustainable society which does not undermine its socio-ecological system as it allow to regenerate and replenish the socio-ecological system (Bragg, Krogseng, & Schwaller, 2013; Broman & Robèrt, 2017; Janssen, Kfoury, & Verkouw, 2012). A sustainable society (consisting of four sustainable principles) seeks to reduce 1) concentration of substances extracted from Earth's crust, 2) concentration of substances produced by society, 3) degradation of physical means; and, at the same time, seeks to 4) mitigate obstacles to society's access to health, influence (people's opportunity to contribute to societal system), competence (individual and collective learning), impartiality (in terms of equity and fair opportunities) and meaning-making (towards creating individual meaning and co-creating collective meaning) (Broman & Robèrt, 2017). To sum, in order to achieve socio-ecological sustainability, society must adapt to functioning in a manner that does not disrupt the balance of the socio-ecological system on planet earth (Colldahl et al., 2013).

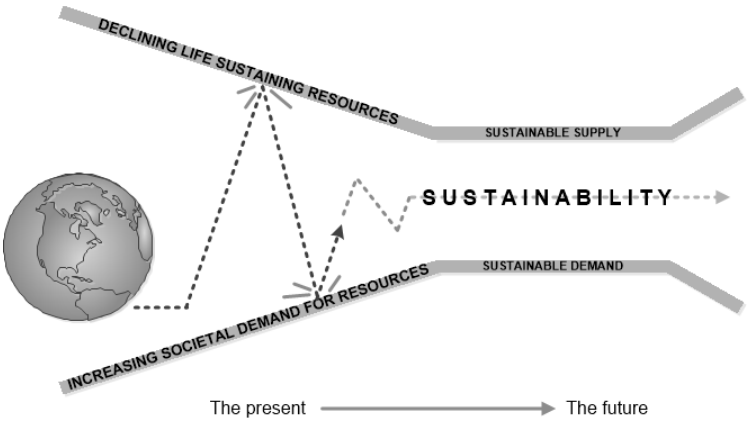


Figure 1: The Funnel Metaphor

2.2 Sustainable development and the role of firms

The concept of sustainable development is about finding ways that does not undermine the balance of socio-ecological systems (Holden, Linnerud, & Banister, 2014, 2017). Firms play a vital role in contributing to sustainable development (Tukker, Charter, Vezzoli, Stø, & Andersen, 2017), as firms are part of society (Waldron et al., 2008), use a significant part of the necessary resources, capacities and mechanisms within their business activities (Bratt, 2014; De Larderel, 2009) and are therefore highly dependent on natural and human resources (Mushipe, 2017). For firms, sustainable development means "applying business strategies and activities that meet the needs of the current generation, while protecting, sustaining and enhancing the human and natural resources that will be needed in the future" (Falle, Rauter, Engert, & Baumgartner, 2016, p. 545; IISD, 1992). In the broader debate in the literature this is also characterized as corporate sustainability (CS: meeting the needs of today's and future generations by proactively contribute to short- and long term economic, environmental and social performance of a firm (Ashrafi et al., 2018; Dyllick & Hockerts, 2002)), corporate social responsibility (CSR: "the social responsibility of firms encompasses the economic, legal, ethical, and discretionary expectations that society has of firms at a given point in time" (Ashrafi et al., 2018; Carroll, 1979, p.500; Sarkar & Searcy, 2016)) and creating shared value (CSV: "creating economic value in a way that also creates value for society by addressing its needs and challenges" (Porter & Kramer, 2019, p. 327)).

The role of firms in sustainable development is to eliminate the negative effects of business activities on society (Carpenter & White, 2004). The current through-put system of continuous growth in which resources are extracted from the socio-ecological system, processed and used in business activities, and then unused resources are discarded back into the socio-ecological system is unsustainable (Telesford, 2014). Attempts by firms to transform into a more sustainable society by minimizing their negative impacts on the social-ecological system can be considered a stepwise process of sustainable development (Telesford, 2014). However, this transformation should not be an end in itself, but rather an activity that should lead to a path of sustainability (Broman & Robèrt, 2017; Telesford, 2014). This

path of sustainability is guided by sustainable development strategies that fosters innovation, creativity and the unlimited potential for change that open the walls of the funnel by creating sustainable solutions (Broman & Robèrt, 2017; de Nooij & van der Lijke-van Veen, 2014; Xie, Fang, & Zeng, 2016).

In addition, companies should not be considered as a single entity, as companies are often part of at least one supply chain (Bratt, 2014). The creation of new resources and the ability to build upon exiting capabilities also depends on other firms in the supply chain (Arya & Lin, 2007; Lavie, 2006). Innovation throughout the supply chain can lead to a more sustainable supply chain, which enhances social and ecological performance of firms within that supply chain (Silvestre & Ţîrcă, 2019). This implicate that no firm is more sustainable than its supply chain partners (Bratt, 2014). Also, integrated knowledge is needed to understand the complex sustainability issues caused by the complex interplay of different social-ecological factors (Abson et al., 2017; Bratt, 2014). So, extensive coordination and collaboration between firms and sectors is required in the elimination of the negative effects of business activities on society (Broman & Robèrt, 2017; Carpenter & White, 2004). In addition, large and powerful firms are needed in order to make the transition to a more sustainable society (Willard, 2012). Without their support, restoring ecological systems and healing social systems takes longer and may be impossible (Bratt, 2014), as smaller firms often lack the resources and time to invest in business activities that go beyond their core business (e.g. sustainability or innovation) (Spitz, Kamphof, & Hogeling, 2016). In conclusion, firms fulfil one of the pivotal leadership roles in a transition to a more sustainable society (Bratt, 2014; Tukker et al., 2017).

2.3 The Resource Based View

The resource based view (RBV) is a key concept for sustainable development (Cardoni et al., 2020). It refers to the resources and capabilities a firm can exploit to achieve competitive advantage and superior firm performance (Alvarez & Barney, 2007; Barney, 1991; Wernerfelt, 1984). Resources refer to “assets or inputs to a business activity (tangible or intangible) that a firm owns, controls, or has access to on a semi-permanent basis” (Helfat & Peteraf, 2003, p. 999; I.-L. Wu & Chiu, 2015). The unique capability of a firm is to deploy or transform its resources for the purpose to achieve a particular end result (performance) (Miller, 2019; Yeoh & Roth, 1999). Put differently, capabilities are organizational routines that convert combinations of resources (inputs) into new resources that lead to a particular performance (output) (Combs & Ketchen, 1999; Ritter & Lettl, 2018). As previously described, firms play an important role in the losing ability of the socio-ecological system to provide the necessary resources and conditions to support the fulfilment of human needs (Bratt, 2014). Therefore, firms need to identify and develop specific resources and capabilities in such a way that it preserve the Earth's natural resources and ecosystems and ensures social living standards (Annunziata, Pucci, Frey, & Zanni, 2018; Ashby, 2018; da Cunha Bezerra et al., 2020).

The RBV's contemporary debate centres on the concept of sustainable development, which demonstrate how firms can contribute to development that recognizes the needs of this and future generations by protecting the natural environment and safeguarding social standards (Baumgartner & Ebner, 2010; Lozano et al., 2015; Vildåsen, Keitsch, & Fet, 2017). Although sustainable development has focused on the interrelation and balance between environmental, social and economic issues (Elkington & Rowlands, 1999; Gong, Simpson, Koh, & Tan, 2018; Gupta & Gupta, 2020), a number of authors have argued that the economic dimension does not contribute to the sustainable development of a society (Bastien & Holmarsdottir, 2017; Holden et al., 2017). So, firm survival depends on the ability to create new resources and the ability to build upon existing capabilities (Peteraf, 1993; Yu, Chavez, Jacobs, & Feng, 2018), within the constraints of the social and ecological environment (Tate & Bals, 2018).

2.2.1 The resourced based view in a sustainability context

The RBV highlights the economic-oriented resources and overlooked the natural environmental resources and social resources (Hart, 1995; Tate & Bals, 2018). The natural resource based view (NRBV) integrates the natural environment into the RBV (Hart & Dowell, 2010), and emphasizes how firms can enhance their performance while simultaneously securing ecological values (Olajide, Kwak, He, & Lim, 2019; Vildåsen et al., 2017). The NRBV extend the application of the original RBV and includes the need to control environmental constraints to bridge the disassociation between humanity and the natural world caused by the current global economic paradigm (Gladwin, Kennelly, & Krause, 1995; Tate & Bals, 2018). In particular, NRBV argues that firms competitive advantage and superior firm performance depends on their ability to utilize their resources to develop proactive environmental strategies, including pollution prevention, product stewardship, clean technology and base of the pyramid (Hart & Dowell, 2010; Olajide et al., 2019). The latter can be seen as a first implicit step towards the inclusion of the social side within RBV, as it includes the role of companies in alleviating poverty for the poorest global citizens (Hart & Dowell, 2010; Immelt, Govindarajan, & Trimble, 2009).

In the social resource based view (SRBV), expanded from the RBV and NRBV, attention is paid to the neglected social dimension (Svensson et al., 2018; Tate & Bals, 2018). The SRBV promotes the well-being of members of the organization while maintaining a healthy society (Missimer et al., 2017a, 2017b). Tate and Bals (2018) expand the RBV by including access to education, water and energy, and support poverty alleviation, to an emergent social RBV (Høgevold, Svensson, Rodriguez, & Eriksson, 2019). Specifically, SRBV argues that firms competitive advantage and superior firm performance depends not only on internal resources but also on social capabilities, including commitments, connections, and consistency (Arena, Azzone, & Piantoni, 2020; Doherty, Thompson, Meehan, Meehan, & Richards, 2006; Tate & Bals, 2018). To sum, the SRBV covers the social resources and constrains (Arena et al., 2020).

2.4 Proposing a framework on the corporate sustainability RBV

The role of firms as agents of sustainable development towards a more sustainable society has been recognized. Firms use a significant part of the necessary resources, capacities and mechanisms within their business activities (Bratt, 2014; De Larderel, 2009) and are therefore highly dependent on natural and human resources (Mushipe, 2017). Sustainable business activities refer to the close integration of social and environmental consideration in the strategies and practices of the firm (Kotsantonis, Pinney, & Serafeim, 2016; Sharma, Bhattacharya, & Thukral, 2019). The RBV is a concept that describes how resources and capabilities of a firm are exploited trough business activities in order to achieve firm performance (Alvarez & Barney, 2007; Barney, 1991; Wernerfelt, 1984). Firms must use both non-renewable resources and human resources responsibly in order to not systematically degrade the ecological and social systems of society (Broman & Robèrt, 2017; Sitnikov & Bocean, 2013). In addition, firms should not be seen as a single entity, as companies are often part of at least one supply chain (Bratt, 2014). The creation of new resources and the ability to build upon exiting capabilities also depends on other firms in the supply chain (Arya & Lin, 2007; Lavie, 2006). So, resources and capabilities create chains of business activities that are directly and indirectly linked to firm performance (Habbershon, Williams, & MacMillan, 2003).

Corporate sustainability (CS) refers to firm activities that proactively seek to contribute to a balanced socio-ecological system of today and of future generations (Holden et al., 2017; Lozano, 2015; Van Marrewijk & Werre, 2003). Firm performance is sustainable when firms have reduced its harm and produced regenerative impacts on socio-ecological systems (Adam, Jusoh, Mardani, Streimikiene, & Nor, 2019). It can be measured to what extent a firm embraces environmental, social and governance factors into its business activities, and ultimately the impact they exert on society (Artiach, Lee, Nelson, & Walker, 2010). So, the performance of a firm is exactly what links sustainable business activities with a sustainable society. To sum, firms that engage in sustainable practices develop resources that lead to firm performance that have a positive impact on society.

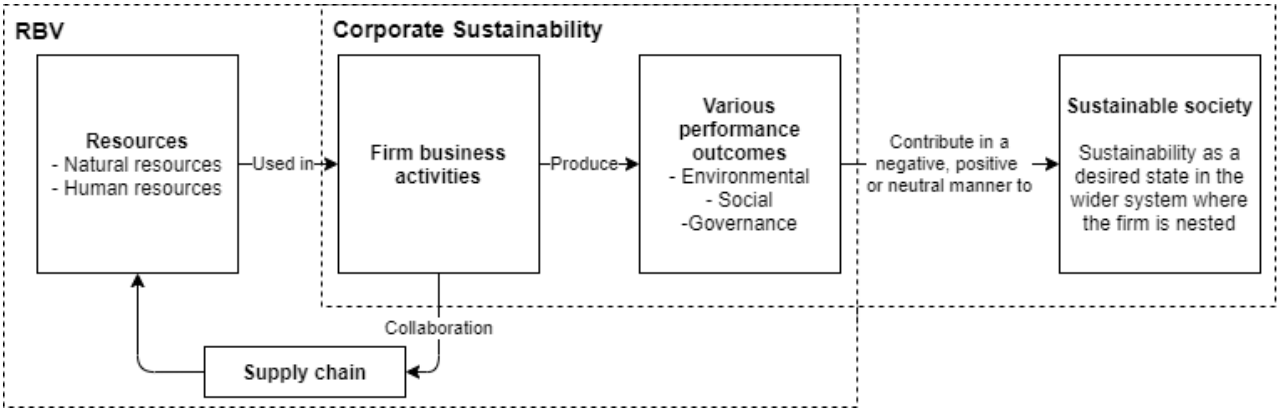


Figure 2: The corporate sustainable resource based view (CS RBV)

(adapted from Lankoski, 2016)

3. Method

3.1 Research Design

A mixed-method strategy was applied to achieve the research objective, as both quantitative and qualitative data were collected and analysed (Shorten & Smith, 2017). To analyse whether firm performance contributes to a more sustainable society, a multiple regression analysis is employed. This quantitative design was utilized as this research empirically investigate the relationship between observable phenomena (firm performance and sustainable society), by collecting and analysing numerical data trough statistical, mathematical or computational techniques (Burrell & Gross, 2018; Donmoyer, 2008; Garwood, 2006). In this way, quantitative research identifies relationships between the variables (firm performance and sustainable society) to unveil patterns, associations and causal relationships (De Klerk, 2019). This quantitative research design is the most appropriate for the following reasons: 1) it allows to make statements about whether firm performance contribute to a more sustainable society, 2) available data on firm performance and a sustainable society are both measured numerically, 3) most studies on sustainable performance apply quantitative research method, however no research have coupled both concepts before 3) this research tries to explain the dependent variable (sustainable society) by making use of a set of independent variables (firm performance) and 4) this research does not aim to gather in-depth understanding of individual experiences (Burrell & Gross, 2018; De Klerk, 2019). In addition to the quantitative research, qualitative research was conducted in which the results of the quantitative research have been validated with practice.

3.2 Sample and data collection

The sample of this study consisted of listed firms in the European Union (EU) for the years 2006, 2011 and 2016. Listed firms in the EU were chosen as EU leads the world on sustainability (SDSN & IEEP, 2019). Observations were excluded from the sample if information was missing. The final sample for each year and the considerable heterogeneity in the sample in terms of the region and industry are shown in table 1. The sample size (N) differs per year, because the unit of analysis are listed firms in the EU that contributes to a more sustainable society. Countries are grouped into regions according to the United Nations Geoscheme (United Nations, 2020), while industries are classified according to the four-digit Standard Industrial Classification (SIC) codes (NAICS, 2020).

	2006 (N=579)		**2011 (N=783)**		**2016 (N=971)**	
Region (4 regions)						
Northern Europe (NE)	*291*	*(50,3%)*	*350*	*(44,7%)*	*475*	*(48,9%)*
Eastern Europe (EE)		-	*33*	*(4,2%)*	*40*	*(4,1%)*
Southern Europe (SE)	*88*	*(15,2%)*	*133*	*(17%)*	*147*	*(15,1%)*
Western Europe (WE)	*200*	*(34,5%)*	*267*	*(34,1)*	*309*	*(31,8%)*
Industry (8 types)						
Mining	*28*	*(4,8%)*	*49*	*(6,3%)*	*55*	*(5,7%)*

Construction	*24*	*(4,1%)*	*33*	*(4,2%)*	*35*	*(3,6%)*
Manufacturing	*206*	*(35,6%)*	*266*	*(34%)*	*311*	*(32%)*
Transportation, communications, electric, gas and sanitary service	*80*	*(13,8%)*	*113*	*(14,4%)*	*134*	*(13,8%)*
Wholesale trade	*11*	*(1,9%)*	*15*	*(1,9%)*	*18*	*(1,9%)*
Retail trade	*41*	*(7,1%)*	*51*	*(6,5%)*	*65*	*(6,7%)*
Finance, insurance and real estate	*128*	*(22,1%)*	*180*	*(23%)*	*253*	*(26,1%)*
Services	*61*	*(10,5%)*	*76*	*(9,7%)*	*100*	*(10,3%)*

Table 1: Sample size and industry and region distribution

The dataset was formed by combining two different databases. Environmental, social and governance (ESG) performance indicators of listed firms in the European Union were obtained from ASSET4 database. Founded in 2003, ASSET4 was a privately held Swiss-based firm, acquired by Thomson Reuters in 2009 and branded in 2018 as Refinitive. The ASSET4 collects and compiles publicly available information on firms corporate sustainability using 400 data points, combined into 178 key performance indicators, which are aggregated into a framework of 10 category scores from over 7000 international listed firms distributed around the world and belonging to several industries (Refinitiv, 2019). The objective of the ESG Scores from Refinitiv is to transparently and objectively measure a firm's relative environmental, social and governance (ESG) performance (Refinitiv, 2019). On the other hand, information on the sustainability of a country were obtained from the Sustainable Society Index (SSI). The Sustainable Society Foundation in the Netherlands has been developing since 2006 the SSI dataset to provide the public at large, as well as politicians and authorities, with transparent information about the environmental wellbeing, social wellbeing, and economic wellbeing of 151 countries (Saisana & Philippas, 2012). The development of SSI dataset was a response to the existing indices and sets of sustainability indicators at the national level, which do not really represent a sustainable society due to the multidimensionality of the theoretical construct (Seppälä, Leskinen, & Myllyviita, 2017). The SSI index incorporates key aspects of already existing indexes (e.g. human development index and the ecological footprint), and in this way covers sustainability in its broadest sense (Van de Kerk & Manuel, 2008). The SSI is based on the Brundtland definition, and incorporates 24 indicators, grouped into eight categories, which are further aggregated into three dimensions of well-being, and finally aggregated into one overall index, the SSI (Seppälä et al., 2017). The objective of the SSI is to not only measure the level of sustainability, but also monitor progress to sustainability (Ding, Fu, Lai, & Leung, 2018).

To validate the quantitative results, two interviews were held with two experts in the field of CS. Marije Klomp was former director of CSR Netherlands (in Dutch: MVO Nederland) and currently Program Director Sustainability at the Radboud University. Sjors Witjes was former management consultant on CS and currently Assistant Professor Strategic Management and Chairman of the Sustainable Development Network at the Radboud University. Thanks to their experience, both experts have a good idea of sustainability and how firms contribute to a more sustainable society. This has placed the results of the quantitative research in a broader context and validated it in practice.

3.3 Measures

The dependent variable of this research is the Sustainable Society Index (SSI), which is measured by the environmental wellbeing, human wellbeing, and economic wellbeing. This variable represents the actual level of sustainability of a certain country (Van de Kerk & Manuel, 2008). The independent variables of this research were obtained from the environmental, social and governance (ESG) performance indicators from the ASSET4 database which represents the actual sustainability performance of a firm (Refinitiv, 2019). The environmental pillar, including resource use, emission and innovation, measures the impact of firms on living and non-living natural systems to avoid environmental risk (Budsaratragoon & Jitmaneeroj, 2019). Workforce, human rights, community and product responsibility are categories that are part of the social pillar which measures firm abilities to generate loyalty and trust among employees, customers, and society (Budsaratragoon & Jitmaneeroj, 2019). The governance pillar, categorized by management, shareholders, and CSR strategy, measures firm systems and processes to ensure that the firms executives and board members perform to generate long-term shareholder value (Budsaratragoon & Jitmaneeroj, 2019). In addition, control variables region and type of industry are taken into consideration. In summary, sixteen variables are examined to see whether firm performance contributes to a more sustainable society (see table 2).

Variable Name	**Variable label**	**Unit/ categories**
SSI	Sustainability level of a certain country	10- point scale: 10=sustainable, 1=not sustainable
Environmental Wellbeing	The level of environmental wellbeing of a certain country based on healthy environment, climate & energy and natural resources	
Human Wellbeing	The level of human wellbeing of a certain country based on basic needs, personal development and well balanced society	
Economic Wellbeing	The level of economic wellbeing of a certain country based on preparation for the future and economy	
Resource Use	Firms "performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management." (Refinitiv, 2019, p. 16)	In percentage points: scale 0-100
Emission	Firms "commitment and effectiveness towards reducing environmental emissions in the production and operational processes." (Refinitiv, 2019, p. 16)	
Environmental Innovation	Firms "capacity to reduce the environmental costs and burdens for its customers, thereby creating new market opportunities through new environmental technologies and processes or eco-designed products." (Refinitiv, 2019, p. 16)	
Workforce	Firms "effectiveness towards job satisfaction, a healthy and safe workplace, maintaining diversity and equal opportunities and development opportunities for its workforce." (Refinitiv, 2019, p. 16)	
Human Right	Firms "effectiveness towards respecting the fundamental human rights conventions." (Refinitiv, 2019, p. 16)	
Community	Firms "commitment towards being a good citizen, protecting public health and respecting business ethics." (Refinitiv, 2019, p. 16)	
Product Responsibility	Firms "capacity to produce quality goods and services integrating the customer's health and safety, integrity and data privacy." (Refinitiv, 2019, p. 16)	
Management	Firms "commitment and effectiveness towards following best practice corporate governance principles." (Refinitiv, 2019, p. 16)	
Shareholders	Firms "effectiveness towards equal treatment of shareholders and the use of anti-takeover devices." (Refinitiv, 2019, p. 16)	

CSR Strategy	Firms "practices to communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes." (Refinitiv, 2019, p. 16)	
Industry	Type of industry of a firm	8 groups
Region	Region where the firm is located	4 groups

Table 2:Variable descriptions

3.4 Data quality

This research uses secondary data that has often been criticized for questionable validity and reliability (Hair, William, Babin, & Anderson, 2014). However, ASSET4 is a leading global provider and has become one of the most reliable and trusted sources of objective, dynamic, auditable and comprehensive ESG information (Sustainable Investment, n.d.). Moreover, ASSET4 is very transparent on how ratings of ESG scores are constructed for each firm as well as how the data is aggregated from information sources (Refinitiv, 2019). Further, various research have investigated the validity of ESG measures and concluded that ESG ratings are highly correlated and therefore capture the ESG construct (Chatterji, Durand, Levine, & Touboul, 2014; Semenova & Hassel, 2015; Smid & Derwall, 2012). On the other hand, SSI is also widely recognized as an index which is a transparent tool that measures the level of sustainability of a country (Saisana & Philippas, 2012). Besides that, the multiple regression analysis itself ask for reliability and validity. To ensure reliability and validity, the research is presented as transparently as possible. The regression model is validated by means of the assessment of the adjusted R2. Additionally, field validity is determined by presenting the results of the quantitative data to two experts in the field of CS.

3.5 Data analysis

A multiple regression analysis is appropriate for this research as this dependence technique allows analysing one dependent variable with multiple independent (predictor) variables (Hair, William, Babin, & Anderson, 2014). By doing this, the single depend value can be predicted by using the independent variables whose values are known. So, this research tries to predict the dependent variable and explaining the effects of independent variables (Hair, Black, Babin & Anderson, 2014). When using multiple regression analysis, all variables used should be measured on a metric scale. The variables industry and region are measured on a nominal scale and therefore dummy variables are created for both variables. Dummifying creates an interval between zero and one, so than the variable is measured on a metric scale. All other variables are measured on a metric scale, so these can all be used in this analysis. Moreover, the sample sizes are also sufficient to perform a multiple regression analysis with sufficient statistical power and generalizability. This is concluded based on the general rules of a multiple regression, which sets a minimum sample of 50 and preferably 100 observations for most research situations (Hair et al., 2014). In this research the sample sizes for the years 2006, 2011 and 2016 are respectively 579, 783 and 971. Sample size also affects the generalizability of the results by the ratio of observations to independent variables. A general rule is that the ratio should never fall below 5:1,

meaning that five observations are made for each independent variable in the variate (Hair et al., 2014). This research uses 16 variables, so this is far above the minimum ratio.

Before the actual regression analysis can be carried out, first particular attention was paid to missing values, outliers, and normality of the distribution. There were various numbers of missing values, and those observations were excluded from the dataset as the missing values influence the mean of the variables in. This resulted in the final sample size earlier mentioned. Although the form of distribution of the variables is not a strict assumption, it does affect the correlations between the variables (Hair et al., 2014). So therefore, the skewness and kurtosis were investigated to see whether the variables are normally distributed. For all distributions, they approach the normal distribution sufficiently. Most variables lie between -3 and +3 (see appendix 1), which is acceptable. However, some dummy variables violate the normality assumption. This is since sample sizes of the groups differ. Besides, it can be noticed that the number of observations is relatively large. Therefore, small distinctions become significant. This is another reason to accept the level of skewness and kurtosis. In addition, several assumptions must be met in order to perform a multiple regression. This includes 1) checking residual plots of the predicted dependent variable for linearity of the phenomenon measured, 2) checking the scatterplot for constant variance of the error terms (homoscedasticity), 3) checking the residuals statistics for independence of the error terms, and 4) checking the Normal probability plot for normality of the error term distribution (Hair et al., 2014). When the assumptions have been checked and are sufficient, the actual regression analysis can be performed. The overall fit of the model has been checked, results have been interpreted and the results have been validated by evaluating the adjusted R2. In conclusion, the analysis described above is consistent with Hair et al. (2014) multiple regression decision process and therefore allows the researcher to perform an adequate multiple regression analysis.

3.6 Research Ethics

Due to the fact that there is no face to face involvement as the researcher did not participate in the primary data collection (Thorne, 2012), other ethical issues are at stake. Ethical issues raised in this research are related to informed consent, fidelity, confidentiality and non-maleficence (Thorne, 2012). Since all the information that is used to construct the ESG dataset comes from publicly available information sources, it is justifiable that companies allow that this information is used. Therefore, it is arguable that the informed consent is not violated. Furthermore, the fidelity is threatened because there is greater distance between the original data source and the analyst (Thorne, 2012). Confidentiality is ensured as much as possible by not explicitly mentioning companies by name. So, violations of confidentiality are almost zero. Finally, this research is beneficent for the majority of the firms, because it provides them with insight on which firm performance could lead to a more sustainable society.

4. Results

To capture the relation between the firm performance and the development of a more sustainable society, different regression analyses are performed. In this way, an attempt was made to look at the available data from different perspectives. First, a bar chart has been created for all variables per year to study the development of the firm's performance indicators, the SSI and the SSI dimensions. Second, multiple regression analyses were performed for the overall SSI index and the individual SSI dimensions. The overall SSI index is not only being investigated, as research has shown that trade-offs can be observed between the SSI dimensions (Ding et al., 2018; Saisana & Philippas, 2012; Seppälä et al., 2017). For example, it seems that human and economic well-being go hand in hand in many countries, but at the expense of environmental well-being. All assumptions for the multiple regression analyses were met (see appendix 2).

4.1 Development of firm's performance indicators, SSI, and SSI dimensions

Figure 3 shows that the output of almost every firm performance indicator has increased over the years. Only the shareholder indicator has hardly changed over the years. Figure 4 shows that the overall SSI index has not changed over the years. The individual dimensions of the SSI show a different picture, as human wellbeing has not changed over the years, environmental wellbeing has increased slightly over the years and economic wellbeing has declined over the years. To sum, even though firms in the ESG data have a higher output on performance indicators and therefore pay more attention to create a higher sustainability performance, this does not affect the SSI as it remains stable over the years.

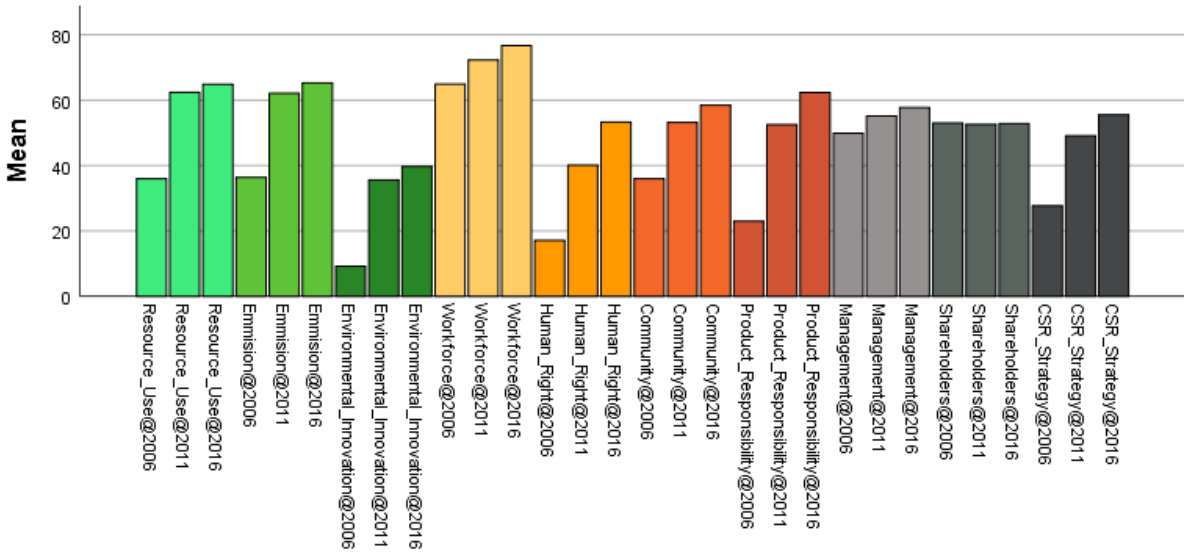


Figure 3: Firm performance indicators for the years 2006, 2011 and 2016

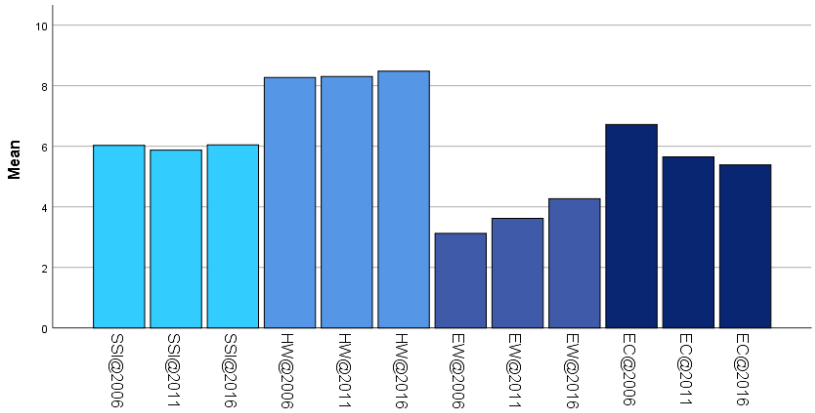


Figure 4: Overal SSI and the individual dimensions of the SSI for the years 2006, 2011 and 2016

4.2 Multiple regression of the overall SSI index and individual dimensions of SSI

A multiple regression was performed on the effect of firm's performance indicators on the overall SSI index and on the effect of firm's performance indicators on the underlying dimensions of the SSI (environmental wellbeing, human wellbeing, and economic wellbeing). For the overall SSI index, the multiple regression analysis consists of two models. The first model contains the control variables industry and region, and the second model contains the ten independent firm performance indicators. The multiple regression analysis for the underlying dimensions of the SSI consist of four models. Again, the first model contains the control variables industry and region. The second, third and fourth models contain the independent performance indicators from respectively the most to least related indicators to the type of SSI dimension (see appendix 3). Table 3 shows the results of those multiple regression analysis for the year 2016 and presents the predictive power of the highest significant models (see appendix ??? for the extensive table of the results).

2016				
	SSI	**EW**	**HW**	**EC**
Highest sig. model	Second	Second	Fourth	Fourth
Positively correlated	Resource Use, Community, CSR Strategy	*Control: SE, RTRADE, FIRE, SERV Emission[3]	Environmental Innovation, Human Right	*Control: EE Resource Use, Workforce[2], Community, CSR[2]
Negatively correlated	*Control: SE, WE, MI, WTRADE, RTRADE, SERV Workforce [2]	*Control: WE Environmental Innovation	*Control: SE, WE CSR Strategy	*Control: SE, CON, WTRADE, RTRADE, SERV Emission
R2	20,2%	32,8%	74,1%	22,2%
R2 adjusted	18,1%	31,7%	73,5%	20,0%
ΔR2 adjusted	3,4%	1,1%	0,1%	1,9%
* reference categories; Northern Europe & Manufacturing				

Table 3: Results of the multiple regression analyses for the year 2016

All regression analyses performed for the year 2016 had useful models and have a low but acceptable explanatory power (resp. F (25,945) = 9,59, p <.001; adj. R2=.181; F (15,955) = 31.0, adj. R2 = 0.317; F (20,950) = 5.46, adj. R2 = 0.735; F (26,944) = 10.35, adj. R2 = 0.200). In the regression analyses of the overall SSI, HW and EC, including firm performance indicators leads to a significantly higher adjusted R square. This means that this improves the explanation of the variance of the model. However, it should be noted that firm performance indicators in those models only explain a small part of the variance of the dependent variable (resp. 3,4%, 0,4% and 5,6%) (see appendix 3). Only the second model of the regression analysis for EW was useful and has a low but acceptable explanatory power (resp. F (15,955) = 31.0, p <.001; adj. R2=.317). In both models, including firm performance indicators leads to a significant higher adjusted R square, which means that this improves the explanation of the variance of the model. This was not the case for models three and four, so those models are not useful and indicate that the social and governance performance indicators did not significantly relates to the environmental wellbeing of a society. Moreover, it should also be noted that the environmental firm performance indicators in the second model only explain a small part of the variance of the environmental wellbeing (1.1%). To sum, in all regression analyses performed a large part of the total variance is explained by the control variables industry and country (resp. 14,7%, 30,6%, 73,1% and 14,4%) (see appendix 3). Thus, the type of industry and the region where a firm is located have a relatively large impact on the overall SSI, EW, HW and EC.

Regression analyses were also performed for the years 2006 and 2011 to check whether firm performance indicators really contribute very little to the overall SSI, EW, HW and EC (see appendix 3 for the results). The same pattern was recognized in these regression analyses as in the regression analyses of 2016. These results also showed that firm performance indicators explain only a small part of the variance of the dependent variable (ΔR2 adjusted= $\leq$ 3,3%). And that the type of industry and region where a firm is located have a relatively large impact on the overall SSI, EW, HW and EC.

4.3 Validation of the results

In addition, the quantitative results were presented to two experts in the field of CS: Marije Klomp and Sjors Witjes. The picture that emerged from practice is that it is very difficult to measure the actual impact of business activities on the sustainability of a society. While many sustainability rankings are available (e.g. ESG, Ecological Footprint and the Human Development Index), a major shortcoming of those existing rankings is that they measure sustainability on throughput and/or output, but not on impact. However, making sustainability measurable is a very important part of the work of sustainability managers. So, the question arose whether measuring sustainability was a means or an end in itself. Moreover, given that the sustainability of a society is caused by many different actors (countries, firms, governments, mobility of individuals, infrastructure, etc.), it is difficult to make the impact measurable

due to the multidimensionality of the construct. For example, at first glance, a firm can have very nice sustainability performance (looking at the output), but that does not necessarily mean that the firm actually contributes to a more sustainable society, such as combating climate change or poverty reduction. This is because output is measured instead of impact. To sum, the ongoing debate in practice is how impact can be measured and made visible and what needs to be measured and how.

To conclude, the evidence of this research implies that firm performance indicators contribute very little to the development towards a more sustainable society. Even though the ESG dataset shows that firms pay more attention to sustainability performance, as the firm performance indicators rise during the years, this does not affect the sustainability of society, as the overall SSI, EW, HW and EC remains stable. Moreover, all the regression analyses showed that firm performance indicators explain only a small part of the variance of the dependent variable. This means that the type of industry and region where a firm is located have a relatively large impact on the overall SSI, EW, HW and EC. Furthermore, practice shows that firm performance output is difficult to link to the sustainability of society as it is all about creating impact and not about generating output.

5. Discussion

This research investigated to what extent the performance indicators of firms can be linked to the development of a more sustainable society. It appears that performance indicators of firms can be linked to the development of a more sustainable society. However, firm performance indicators contribute very little (<6%) to the development of a more sustainable society. Other findings include that the type of industry and region where a firm is located can be linked to the development to a more sustainable society, as they have a relatively large impact on the development towards a more sustainable society. These findings are consistent in all regression models and were recognized in practice.

5.1 Proposing a framework of shared value creation of socially responsible firms for the development of a sustainable society

The current unbalanced socio-ecological system is caused by the unsustainable activities of firms. Firms play therefore a vital role in developing a sustainable society by means of protecting, sustaining and enhancing the human and natural resources of planet earth (Falle et al., 2016; Tukker et al., 2017). The results of this research in terms of the significance of the link between firm performance indicators and a more sustainable society contradict the trend suggested in literature by concepts such as CS and the RBV (see Barney, 1991; Dyllick & Hockerts, 2002; Wernerfelt, 1984). This research found that the concepts of CSR and CSV are more in line with the development of a more sustainable society. Therefore, a new framework of shared value creation of socially responsible firms for the development of a sustainable society is proposed.

Whilst CS refers to firm activities that seek to contribute to sustainability equilibria of current and of future generations by proactively contribute to short- and long term economic, environmental and social performance of a firm (as discussed by Dyllick & Hockerts, 2002; Holden et al., 2014; Holden et al., 2017). And where the NRBV and the SRBV emphasize how firms can enhance their firm performance by responsibly exploiting resources and capabilities to not systematically degrade society's ecological and social systems (as discussed by Hart & Dowell, 2010; Olajide et al., 2019; Tate & Bals, 2018; Vildåsen et al., 2017). In developing a sustainable society, the emphasis is on opening the walls of the funnel in which societies do not undermine the socio-ecological system as it allow to regenerate and replenish the socio-ecological system (see Broman & Robèrt, 2017; Holden et al., 2014; Holden et al., 2017; Robèrt et al., 2004). In this case, the focus of firms switches from output oriented (CS & RBV) to throughput and impact oriented (CSR & CSV). Thus, switching from achieving a particular end result to creating a stepwise development process towards a sustainable society. So, this transformation towards a sustainable society should not be an end in itself, but rather an activity that should lead to a path of sustainability which creates impact and restore the balance of the socio-ecological system on planet earth (as discussed by Broman & Robèrt, 2017; Colldahl et al., 2013; Telesford, 2014).

By incorporating sustainability challenges (as discussed by Gustavsson & Jordahl, 2008; Mishra et al., 2016; Missimer et al., 2017a, 2017b; Robèrt et al., 2004; Wang et al., 2016) into their business activities firms are more likely to develop a sustainable society which do not systematically degrade the socio-ecological system. In this way, firms proactively try to open the walls of the funnel by developing a sustainable society according to the sustainable principles (see Broman & Robèrt, 2017). This, however, requires extensive coordination and collaboration between firms and sectors to eliminate the negative effects of business activities on society (as proposed by Broman & Robèrt, 2017; Carpenter & White, 2004). The sustainability challenges are caused by a complex interplay of different socio-ecological factors that cannot be managed by a single entity, so there is a need for integrated knowledge (as discussed by Abson et al., 2017; Bratt, 2014). In addition, because firms are part of at least one supply chain, they cannot be considered as a single entity. Firms must collaborate because no firm is more sustainable than its supply chain partners (see Bratt, 2014). Moreover, innovation throughout the supply chain and between firms lead to sustainable solutions (as discussed by Broman & Robèrt, 2017; de Nooij & van der Lijke-van Veen, 2014; Silvestre & Ţîrcă, 2019). This therefore requires a shift from knowledge protection to the creation of integrated knowledge through knowledge sharing (see Abson et al., 2017), and a shift from internal innovation to open innovation (see Silvestre & Ţîrcă, 2019; Xie et al., 2016).

The sustainable solutions created by the extensive coordination and collaboration between firms and sectors lead to the creation of shared value. Firms act in a social responsible way in which decisions are in line with the objectives and values of society and Planet Earth (see Ashrafi et al., 2018). In this way, firms can reconnect their success with social progress (as discussed by Porter & Kramer, 2019). What matters is that firms create impact with their business activities on society and the socio-ecological system rather than create a certain output. The link between firm performance indicators and the sustainability of the society convey an important message for firms by highlighting that measuring the output of firm performance contribute very little to the development of a more sustainable society. By taking a responsible role towards society as a whole (see Sarkar & Searcy, 2016) and creating real impact rather than output (see Porter & Kramer, 2019), firms can contribute to the development of a more sustainable society. Creating impact is what can restore the balance of the socio-ecological system by means of creating economic value in a such a way that it also creates value for society by addressing its needs and challenges (as discussed by Porter & Kramer, 2019).

Considering the aforementioned, it is possible to propose a CSR CSV alternative to the CS RBV framework of the development towards a sustainable society presented in fig 5. This new framework centres on sustainability challenges by incorporating the sustainable principles into the business activities of firms and restoring balance of the socio-ecological system by creating impact. In this development process towards a sustainable society value is created through extensive coordination and

collaboration between firms and sectors in which knowledge creation and innovation are stimulated. As a result, this process is not about the output, but about the impact that a firm creates with their business activities on the current unbalanced socio-ecological system. So, to open the walls of the funnels, the focus of firms switches from output oriented to impact oriented which is better reflected by the concepts of CSR and CSV. In this way, firms seek to restore the balance in which planet earth will be able to provide the necessary resources and conditions to meet the needs of current and future generations. Fig.5 shows the integration of those elements into a proposed "Shared value creation of socially responsible firms for the development of a sustainable society" framework.

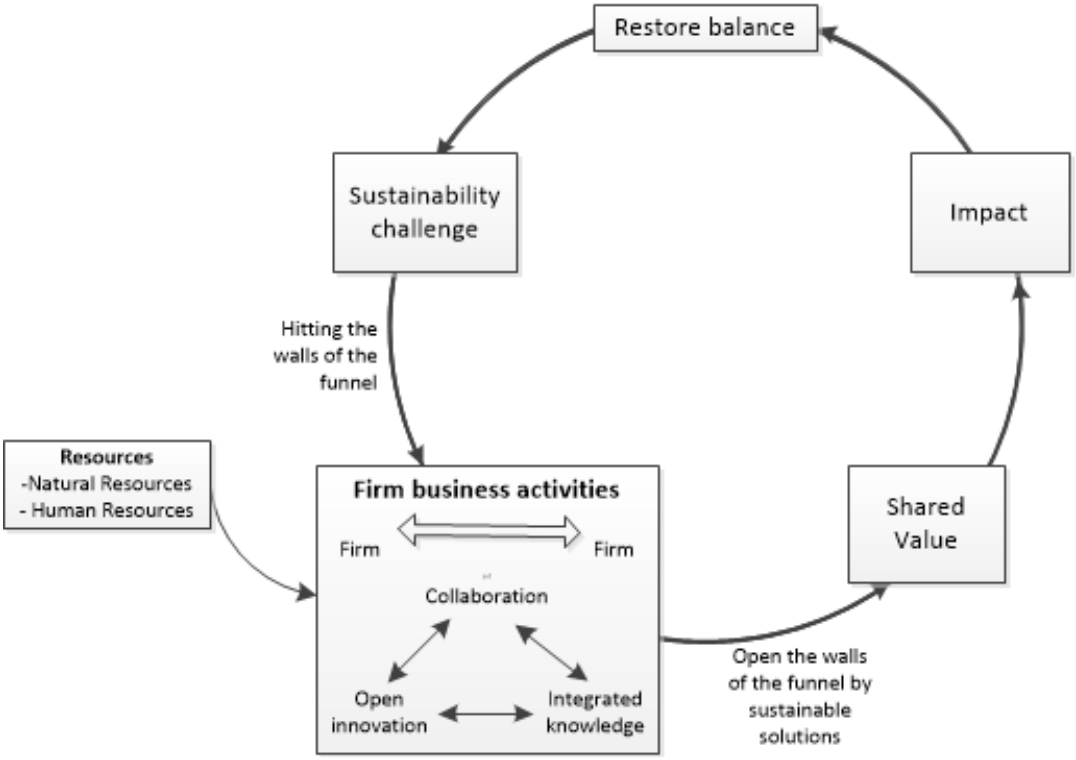


Figure 5: Shared value creation of socially responsible firms for the development of a sustainable society framework

5.2 Quantitative research does not fit sustainable development research

The results of this research should also be viewed in line of the quantitative method that has been used. Surprisingly, firm performance indicators only contribute for a very small part to the development of a more sustainable society. This result may be explained by the fact that ESG dataset only contains listed firms (see Refinitiv, 2019), whereas the data in the SSI dataset is caused by many more actors than just listed firms (e.g. governments, individuals, and SME's) (see Van de Kerk & Manuel, 2008). In addition, listed firms often operate internationally, and the effects of their sustainability policy are not limited to the country in which they are located. The ESG dataset is based on the country where the headquarter of the listed firms are located, but not on the country in which the firms produces. As a result, the country where the headquarters are located is not the country where these firms are the most polluting to society.

Moreover, listed firms are only involving a very small proportion of all firms that contribute to a more sustainable society. Another explanation is that the SSI dataset also is caused by indicators over which firms have no influence (e.g. population growth). This may explain why not only listed firms are needed in order to make the transition to a more sustainable society (as proposed by Bratt, 2014; Spitz et al., 2016; Willard, 2012). So, one of the issues that emerges from these findings is that there is no dataset currently available that measures how firms contribute to a more sustainable society. A lot of attention is paid to making sustainability measurable, while the actual adding value to sustainability has shifted to the background. These findings support the notion that measuring sustainability is very difficult and that it therefore has become more of an end in itself than a means. Because it is difficult to measure the extent to which companies contribute to a more sustainable society, other research types are better suited. For example, a case study in which the relationship between throughput, output and impact can be explored in more detail and in which this relationship can also be observed is better suited.

5.3 Implications of this research

This research makes several contributions to the literature on sustainable development. First, findings of this research provide more insights into the role of firms with regard to sustainable development and suggests that the development towards a more sustainable society is more in line with the concepts of CSR and CSV than CS and RBV. To this end, this research provides surprising results by showing that firm performance indicators have little influence on the development towards a more sustainable society. This implies that firms should not focus on increasing their firm performance output, but rather focus on the impact they have and the role that they take into the society. Second, this research contributes to the current debate in literature on how firms contribute to a more sustainable society, by providing a quantitative research on this relation. Most literature only looked at the output of firms and suggested that high sustainable firm performance lead to an improvement of the sustainability of the society. However, this study refutes this conclusion because it shows that robust performance indicators hardly correlate with the sustainability of a society. Third, the findings presented have implications for both managers of listed firms and researchers in strategic management. Based on CSR and CSV, it is essential that managers must focus on creating shared value and impact to restore the balance of the current socio-ecological system. However, there is a lack of research in impact measurement and how firms can create impact. Therefore, researchers in strategic management should focus on how firms can create impact and how it can be measured to monitor progress.

5.4 Limitations and suggestions for further research

The results of this research are limited by the fact that only listed firms from Europe were included. This means that other actors, e.g. governments, individuals, and other continents, have been omitted from this research. These actors also contribute to or hinder the development towards a more sustainable society. It is therefore recommended that further research should be conducted on how those actors relate to the development towards a more sustainable society to enhance the generalisation of the findings. Moreover, this research examined specifically the output related performance indicators of respectively 10 ESG categories and 3 SSI dimensions. It would be interesting to explore the relationships of the underlying constructs with the development towards a more sustainable society. This would be a fruitful area of investigation since it could unravel the complexity of the concept of sustainability and sustainable development. In addition, an important limitation of this research is that it investigates the output rather than the impact that a firm has on the development towards a more sustainable society. However, no datasets were available that measures the impact of firms on a sustainable society. It is therefore recommended to further investigate how impact can be made visible and whether it is meaningful to quantify this impact.

Sources

Aagaard, A. (2018). *Sustainable Business Models: Innovation, Implementation and Success*: Springer.

Abson, D. J., Fischer, J., Leventon, J., Newig, J., Schomerus, T., Vilsmaier, U., . . . Lang, D. J. (2017). Leverage points for sustainability transformation. *Ambio, 46*(1), 30-39. doi:10.1007/s13280-016-0800-y

Adam, I. H. D., Jusoh, A., Mardani, A., Streimikiene, D., & Nor, K. M. (2019). Scoping research on sustainability performance from manufacturing industry sector. *Problems and Perspectives in Management, 17*(2), 134.

Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action. *Strategic entrepreneurship journal, 1*(1-2), 11-26.

Annunziata, E., Pucci, T., Frey, M., & Zanni, L. (2018). The role of organizational capabilities in attaining corporate sustainability practices and economic performance: Evidence from Italian wine industry. *Journal of Cleaner Production, 171*, 1300-1311.

Arena, M., Azzone, G., & Piantoni, G. (2020). Shared value creation during site decommissioning: A case study from the energy sector. *Journal of Cleaner Production, 251*, 119587.

Artiach, T., Lee, D., Nelson, D., & Walker, J. (2010). The determinants of corporate sustainability performance. *Accounting & Finance, 50*(1), 31-51.

Arya, B., & Lin, Z. (2007). Understanding collaboration outcomes from an extended resource-based view perspective: The roles of organizational characteristics, partner attributes, and network structures. *Journal of Management, 33*(5), 697-723.

Ashby, A. (2018). Developing closed loop supply chains for environmental sustainability. *Journal of Manufacturing Technology Management*.

Ashrafi, M., Adams, M., Walker, T., & Magnan, G. (2018). How corporate social responsibility can be integrated into corporate sustainability: a theoretical review of their relationships. *International Journal of Sustainable Development & World Ecology, 25*(8), 672-682.

Bansal, P. (2005). Evolving sustainably: A longitudinal study of corporate sustainable development. *Strategic Management Journal, 26*(3), 197-218.

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

Bastien, S., & Holmarsdottir, H. B. (2017). The sustainable development goals and the role of youth-driven innovation for social change. In *Youth as Architects of Social Change* (pp. 3-22): Springer.

Baumgartner, R. J., & Ebner, D. (2010). Corporate sustainability strategies: sustainability profiles and maturity levels. *Sustainable Development, 18*(2), 76-89.

Bragg, E., Krogseng, K., & Schwaller, C. (2013). Leveraging a More Sustainable Global Agricultural System: Improving Multinational Organizations' Capacities to Procure. In.

Bratt, C. (2014). *Integrating a strategic sustainability perspective into eco-labelling, procurement and supply chain management.* Blekinge Institute of Technology,

Broman, G. I., & Robèrt, K.-H. (2017). A framework for strategic sustainable development. *Journal of Cleaner Production, 140*, 17-31.

Budsaratragoon, P., & Jitmaneeroj, B. (2019). Measuring causal relations and identifying critical drivers for corporate sustainability: the quadruple bottom line approach. *Measuring Business Excellence*.

Burrell, N. A., & Gross, C. (2018). Quantitative Research, Purpose of. In M. Allen (Ed.), *The SAGE Encyclopedia of Communication Research Methods*. Thousand Oaks, Calafornia: SAGE Publications, Inc.

Büyüközkan, G., & Karabulut, Y. (2018). Sustainability performance evaluation: Literature review and future directions. *Journal of environmental management, 217*, 253-267.

Cardoni, A., Kiseleva, E., & Taticchi, P. (2020). In Search of Sustainable Value: A Structured Literature Review. *Sustainability, 12*(2), 615.

Carpenter, G., & White, P. (2004). Sustainable development: Finding the real business case. *Corporate Environmental Strategy: International Journal for Sustainable Business, 11*(2), 2-51.
Carroll, A. B. (1979). A three-dimensional conceptual model of corporate performance. *Academy of Management Review, 4*(4), 497-505.
Chang, R.-D., Zuo, J., Zhao, Z.-Y., Zillante, G., Gan, X.-L., & Soebarto, V. (2017). Evolving theories of sustainability and firms: History, future directions and implications for renewable energy research. *Renewable and Sustainable Energy Reviews, 72*, 48-56.
Chatterji, A., Durand, R., Levine, D., & Touboul, S. (2014). Do ratings of firms converge? Implications for strategy research.
Colldahl, C., Frey, S., & Kelemen, J. E. (2013). Smart cities: Strategic sustainable development for an urban world. In.
Combs, J. G., & Ketchen, J., David J. (1999). Explaining interfirm cooperation and performance: toward a reconciliation of predictions from the resource-based view and organizational economics. *Strategic Management Journal, 20*(9), 867-888.
da Cunha Bezerra, M. C., Gohr, C. F., & Morioka, S. N. (2020). Organizational capabilities towards corporate sustainability benefits: A systematic literature review and an integrative framework proposal. *Journal of Cleaner Production, 247*.
da Silva, S. B., & Bitencourt, C. C. (2018). Towards a Social-Resource-Based View (SRBV). *Mega Journal of Business Research, 2018*.
Dahlmann, F., Branicki, L., & Brammer, S. (2019). Managing carbon aspirations: The influence of corporate climate change targets on environmental performance. *Journal of business ethics, 158*(1), 1-24.
De Klerk, D. (2019). *Maternal knowledge, attitude and practices with regard to postnatal care services in a Free State rural hospital*. University of the Free State,
De Larderel, J. A. (2009). Sustainable development: The role of business. *Public administration and public policy, 2*.
de Nooij, R. J. W., & van der Lijke-van Veen, J. C. (2014). *Een helder kader voor duurzaamheid*. Retrieved from http://www.optimalplanet.nl/wp-content/uploads/2015/02/Een-helder-kader-voor-duurzaamheid-2014-09-05.pdf
Ding, Y., Fu, Y., Lai, K. K., & Leung, W. J. (2018). Using ranked weights and acceptability analysis to construct composite indicators: A case study of regional sustainable society index. *Social Indicators Research, 139*(3), 871-885.
Doherty, B., Thompson, J., Meehan, J., Meehan, K., & Richards, A. (2006). Corporate social responsibility: the 3C-SR model. *International journal of social economics*.
Donmoyer, R. (2008). Quantitative research. In L. M. Given (Ed.), *The SAGE Encyclopedia of Qualitative Research Methods*. Thousand Oaks, California: SAGE Publications, Inc.
Dyllick, T., & Hockerts, K. (2002). Beyond the business case for corporate sustainability. *Business strategy and the environment, 11*(2), 130-141.
Eccles, R. G., & Serafeim, G. (2011). Leading and lagging countries in contributing to a sustainable society. *Harvard Business School Working Knowledge*.
Elkington, J., & Rowlands, I. H. (1999). Cannibals with forks: the triple bottom line of 21st century business. *Alternatives Journal, 25*(4), 42.
Falle, S., Rauter, R., Engert, S., & Baumgartner, R. J. (2016). Sustainability management with the sustainability balanced scorecard in SMEs: Findings from an Austrian case study. *Sustainability, 8*(6), 545.
França, C. L., Broman, G., Robèrt, K.-H., Basile, G., & Trygg, L. (2017). An approach to business model innovation and design for strategic sustainable development. *Journal of Cleaner Production, 140*, 155-166.
Garwood, J. (2006). Quantitative Research. In V. Jupp (Ed.), *The SAGE Dictionary of Social Research Methods*. London: SAGE Publications, Ltd.
Gladwin, T. N., Kennelly, J. J., & Krause, T.-S. (1995). Shifting paradigms for sustainable development: Implications for management theory and research. *Academy of Management Review, 20*(4), 874-907.

Gong, M., Simpson, A., Koh, L., & Tan, K. H. (2018). Inside out: The interrelationships of sustainable performance metrics and its effect on business decision making: Theory and practice. *Resources, Conservation and Recycling, 128*, 155-166.
Gupta, A. K., & Gupta, N. (2020). Effect of corporate environmental sustainability on dimensions of firm performance – Towards sustainable development: Evidence from India. *Journal of Cleaner Production, 253*, 119948.
Gustavsson, M., & Jordahl, H. (2008). Inequality and trust in Sweden: Some inequalities are more harmful than others. *Journal of Public Economics, 92*(1), 348-365.
Habbershon, T. G., Williams, M., & MacMillan, I. C. (2003). A unified systems perspective of family firm performance. *Journal of Business Venturing, 18*(4), 451-465.
Hahn, T., & Scheermesser, M. (2006). Approaches to corporate sustainability among German companies. *Corporate social responsibility and environmental management, 13*(3), 150-165.
Hair, J. F., William, C. B., Babin, B. J., & Anderson, R. E. (2014). *Multivariate Data Analysis: Pearson International Edition* (7th ed.). London: Pearson Education Limited.
Hart, S. L. (1995). A natural-resource-based view of the firm. *Academy of Management Review, 20*(4), 986-1014.
Hart, S. L., & Dowell, G. (2010). Invited editorial: A natural-resource-based view of the firm: Fifteen years after. *Journal of Management, 37*(5), 1464-1479.
Helfat, C. E., & Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal, 24*(10), 997-1010.
Høgevold, N. M., Svensson, G., Rodriguez, R., & Eriksson, D. (2019). Relative importance and priority of TBL elements on the corporate performance. *Management of Environmental Quality: An International Journal*.
Holden, E., Linnerud, K., & Banister, D. (2014). Sustainable development: our common future revisited. *Global environmental change, 26*, 130-139.
Holden, E., Linnerud, K., & Banister, D. (2017). The imperatives of sustainable development. *Sustainable Development, 25*(3), 213-226.
IISD. (1992). *Business Strategy for Sustainable Development, Leadership and Accountability for the '90s*. Winnipeg: International Institute for Sustainable Development.
Ike, M., Donovan, J. D., Topple, C., & Masli, E. K. (2019). A holistic perspective on corporate sustainability from a management viewpoint: Evidence from Japanese manufacturing multinational enterprises. *Journal of Cleaner Production, 216*, 139-151.
Immelt, J. R., Govindarajan, V., & Trimble, C. (2009). How GE is disrupting itself. *HARVARD BUSINESS REVIEW, 87*(10), 56-65.
Jafari, M., & Rezaee, F. (2014). The effect of resource based view on sustainable capability advantage. *Management Science Letters, 4*(12), 2537-2554.
Janssen, E., Kfoury, S., & Verkouw, R. (2012). Mind the Gap! Strategically Driving GRI Reporting Towards Sustainability. In.
Jones, P., & Comfort, D. (2019). Business Contributions to Sustainable Development: A Study of Leading US Retailers. *Advances in Environmental Studies, 3*(1), 132-140.
Joshi, S., & Li, Y. (2016). What is corporate sustainability and how do firms practice it? A management accounting research perspective. *Journal of Management Accounting Research, 28*(2), 1-11.
Kotsantonis, S., Pinney, C., & Serafeim, G. (2016). ESG integration in investment management: Myths and realities. *Journal of Applied Corporate Finance, 28*(2), 10-16.
Küçükbay, F., & Sürücü, E. (2019). Corporate sustainability performance measurement based on a new multicriteria sorting method. *Corporate social responsibility and environmental management, 26*(3), 664-680.
Lankoski, L. (2016). Alternative conceptions of sustainability in a business context. *Journal of Cleaner Production, 139*, 847-857.
Lavie, D. (2006). The competitive advantage of interconnected firms: An extension of the resource-based view. *Academy of Management Review, 31*(3), 638-658.
Leszczynska, A. (2012). Towards shareholders' value: an analysis of sustainability reports. *Industrial management & data systems*.

Lozano, R. (2015). A holistic perspective on corporate sustainability drivers. *Corporate social responsibility and environmental management, 22*(1), 32-44.
Lozano, R., Carpenter, A., & Huisingh, D. (2015). A review of 'theories of the firm' and their contributions to Corporate Sustainability. *Journal of Cleaner Production, 106*, 430-442.
Miller, D. (2019). The Resource-Based View of the Firm. *Oxford Research Encyclopedia of Business and Management*.
Mishra, R., Mohammad, N., & Roychoudhury, N. (2016). Soil pollution: Causes, effects and control. *Van Sangyan, 3*, 1-14.
Missimer, M., Robèrt, K.-H., & Broman, G. (2017a). A strategic approach to social sustainability–Part 1: exploring the social system. *Journal of Cleaner Production, 140*, 32-41.
Missimer, M., Robèrt, K.-H., & Broman, G. (2017b). A strategic approach to social sustainability–Part 2: a principle-based definition. *Journal of Cleaner Production, 140*, 42-52.
Montiel, I., & Delgado-Ceballos, J. (2014). Defining and measuring corporate sustainability: Are we there yet? *Organization & Environment, 27*(2), 113-139.
Moon, J. (2007). The contribution of corporate social responsibility to sustainable development. *Sustainable Development, 15*(5), 296-306.
Morioka, S. N., & de Carvalho, M. M. (2016). A systematic literature review towards a conceptual framework for integrating sustainability performance into business. *Journal of Cleaner Production, 136*, 134-146.
Mushipe, Z. J. (2017). The Role of Business in Accelerating Sustainable Development in Africa. *Journal of Modern Accounting and Auditing, 13*(6), 281-286.
NAICS. (2020). *Standard Industrial Classification (SIC) code*. Retrieved from https://www.naics.com/sic-codes-industry-drilldown/:
Ny, H., MacDonald, J. P., Broman, G., Yamamoto, R., & Robért, K. H. (2006). Sustainability constraints as system boundaries: an approach to making life-cycle management strategic. *Journal of Industrial Ecology, 10*(1-2), 61-77.
Olajide, O., Kwak, D.-W., He, Q., & Lim, M. (2019). A CONCEPTUAL FRAMEWORK OF ENVIRONMENTAL SUSTAINABILITY IN THE OIL AND GAS SUPPLY CHAINS: NATURAL RESOURCE BASED VIEW (NRBV) AND INSTITUTIONAL THEORY APPROACHES. *Session 1: General Issues in Supply Chain Management*.
Peteraf, M. A. (1993). The cornerstones of competitive advantage: a resource-based view. *Strategic Management Journal, 14*(3), 179-191.
Porter, M. E., & Kramer, M. R. (2019). Creating shared value. In *Managing sustainable business* (pp. 323-346): Springer.
Refinitiv. (2019). *Environmental, Social and Governance (ESG) Scores from Refinitiv*. Retrieved from https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/esg-scores-methodology.pdf
Ritter, T., & Lettl, C. (2018). The wider implications of business-model research. *Long Range Planning, 51*(1), 1-8.
Robèrt, K.-H. (2002). The Natural Step story: Seeding a quiet revolution.
Robèrt, K.-H., Broman, G., Waldron, D., Ny, H., Hallstedt, S., Cook, D., . . . MacDonald, J. (2004). Strategic Leadership Toward Sustainability.
Robèrt, K.-H., Broman, G. I., & Basile, G. (2013). Analyzing the concept of planetary boundaries from a strategic sustainability perspective: how does humanity avoid tipping the planet? *Ecology and Society, 18*(2).
Saisana, M., & Philippas, D. (2012). Sustainable Society Index (SSI): Taking societies' pulse along social, environmental and economic issues. *Environmental Impact Assessment Review, 32*, 94-106.
Sambasivan, M., Bah, S. M., & Jo-Ann, H. (2013). Making the case for operating "Green": impact of environmental proactivity on multiple performance outcomes of Malaysian firms. *Journal of Cleaner Production, 42*, 69-82.
Sarkar, S., & Searcy, C. (2016). Zeitgeist or chameleon? A quantitative analysis of CSR definitions. *Journal of Cleaner Production, 135*, 1423-1435.

Sartori, S., Witjes, S., & Campos, L. M. S. (2017). Sustainability performance for Brazilian electricity power industry: An assessment integrating social, economic and environmental issues. *Energy Policy, 111*, 41-51.
Schrippe, P., & Ribeiro, J. L. D. (2019). Preponderant criteria for the definition of corporate sustainability based on Brazilian sustainable companies. *Journal of Cleaner Production, 209*, 10-19.
SDSN, & IEEP. (2019). *The 2019 Europe Sustainable Development Report*. Retrieved from https://s3.amazonaws.com/sustainabledevelopment.report/2019/2019_europe_sustainable_development_report.pdf
Semenova, N., & Hassel, L. G. (2015). On the validity of environmental performance metrics. *Journal of business ethics, 132*(2), 249-258.
Seppälä, J., Leskinen, P., & Myllyviita, T. (2017). Expert panel weighting and aggregation of the Sustainable Society Index (SSI) 2010–a decision analysis approach. *Sustainable Development, 25*(4), 322-335.
Sharma, D., Bhattacharya, S., & Thukral, S. (2019). Resource-based view on corporate sustainable financial reporting and firm performance: evidences from emerging Indian economy. *International Journal of Business Governance and Ethics, 13*, 323-344. doi:10.1504/IJBGE.2019.10021060
Shi, L., Han, L., Yang, F., & Gao, L. (2019). The Evolution of Sustainable Development Theory: Types, Goals, and Research Prospects. *Sustainability, 11*(24), 7158.
Shorten, A., & Smith, J. (2017). Mixed methods research: expanding the evidence base. *Evidence Based Nursing, 20*(3), 74. doi:10.1136/eb-2017-102699
Silvestre, B. S., & Ţîrcă, D. M. (2019). Innovations for sustainable development: Moving toward a sustainable future. *Journal of Cleaner Production, 208*, 325-332.
Sitnikov, C. S., & Bocean, C. G. (2013). Relationships among social and environmental responsibility and business. *Amfiteatru Economic, 15*, 759-768.
Smid, H., & Derwall, J. (2012). How Robust are CSR Benchmarks? Comparing ASSET4 with Sustainalytics.
Song, M., Cen, L., Zheng, Z., Fisher, R., Liang, X., Wang, Y., & Huisingh, D. (2017). How would big data support societal development and environmental sustainability? Insights and practices. *Journal of Cleaner Production, 142*, 489-500.
Spitz, G., Kamphof, R., & Hogeling, L. (2016). SMALL BUSINESS, GLOBAL IMPACT? *Approaches of Dutch SMEs to the Sustainable Development Goals*.
Steffen, W., Grinevald, J., Crutzen, P., & McNeill, J. (2011). The Anthropocene: conceptual and historical perspectives. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 369*(1938), 842-867.
Sustainable Investment. (n.d.). ASSET4. Retrieved from https://www.sustainable-investment.org/Ratings/Researchkonzepte/Asset4.aspx
Svensson, G., Ferro, C., Høgevold, N., Padin, C., Varela, J. C. S., & Sarstedt, M. (2018). Framing the triple bottom line approach: direct and mediation effects between economic, social and environmental elements. *Journal of Cleaner Production, 197*, 972-991.
Tate, W. L., & Bals, L. (2018). Achieving Shared Triple Bottom Line (TBL) Value Creation: Toward a Social Resource-Based View (SRBV) of the Firm. *Journal of business ethics, 152*(3), 803-826. doi:10.1007/s10551-016-3344-y
Telesford, J. (2014). *Strategic sustainability and industrial ecology in an Island Context, with consideration for a green economy road map: A study in the tourist accommodation sector, Grenada.*
Thorne, S. (2012). Ethical and representational issues in qualitative secondary analysis. In J. Goodwin (Ed.), *SAGE secondary data analysis* (Vol. IV: Ethical, Methodological and Practical Issues in Secondary Analysis, pp. 1-11). London: SAGE Publications Ltd.
Tukker, A., Charter, M., Vezzoli, C., Stø, E., & Andersen, M. M. (2017). *System innovation for sustainability 1: Perspectives on radical changes to sustainable consumption and production*: Routledge.
United Nations. (2020). *Standard country or area codes for statistical use (M49)*. Retrieved from https://unstats.un.org/unsd/methodology/m49/:

Utz, S. (2019). Corporate scandals and the reliability of ESG assessments: evidence from an international sample. *Review of Managerial Science, 13*(2), 483-511.
Van de Kerk, G., & Manuel, A. R. (2008). A comprehensive index for a sustainable society: The SSI — the Sustainable Society Index. *Ecological Economics, 66*(2), 228-242.
Van Marrewijk, M., & Werre, M. (2003). Multiple levels of corporate sustainability. *Journal of business ethics, 44*(2-3), 107-119.
Vildåsen, S. S., Keitsch, M., & Fet, A. M. (2017). Clarifying the epistemology of corporate sustainability. *Ecological Economics, 138*, 40-46.
Waldron, D., Robèrt, K.-H., Leung, P., McKay, M., Dyer, G., Blume, R., . . . Connell, T. (2008). Guide to the framework for strategic sustainable development. *Blekinge Institute of Technology*.
Wang, S., Li, Q., Fang, C., & Zhou, C. (2016). The relationship between economic growth, energy consumption, and CO2 emissions: Empirical evidence from China. *Science of The Total Environment, 542*, 360-371.
Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal, 5*(2), 171-180.
Willard, B. (2012). *The new sustainability advantage: seven business case benefits of a triple bottom line*: New Society Publishers.
Woo, J., Shin, S.-J., & Seo, W. (2016). *Developing a big data analytics platform for increasing sustainability performance in machining operations.* Paper presented at the Proceedings of 26th International Conference on Flexible Automation and Intelligent Manufacturing, Seoul, Republic of Korea.
Wu, I.-L., & Chiu, M.-L. (2015). Organizational applications of IT innovation and firm's competitive performance: A resource-based view and the innovation diffusion approach. *Journal of Engineering and Technology Management, 35*, 25-44.
Wu, K.-J., Liao, C.-J., Tseng, M.-L., Lim, M. K., Hu, J., & Tan, K. (2017). Toward sustainability: using big data to explore the decisive attributes of supply chain risks and uncertainties. *Journal of Cleaner Production, 142*, 663-676.
Xie, X., Fang, L., & Zeng, S. (2016). Collaborative innovation network and knowledge transfer performance: A fsQCA approach. *Journal of Business Research, 69*(11), 5210-5215.
Yeoh, P. L., & Roth, K. (1999). An empirical analysis of sustained advantage in the US pharmaceutical industry: Impact of firm resources and capabilities. *Strategic Management Journal, 20*(7), 637-653.
Yu, W., Chavez, R., Jacobs, M. A., & Feng, M. (2018). Data-driven supply chain capabilities and performance: A resource-based view. *Transportation Research Part E: Logistics and Transportation Review, 114*, 371-385.

Appendix

Appendix 1: Normal distribution

For each multiple regression analyses the normal distribution is checked. For all distributions, the variables approach the normal distribution sufficiently. Most variables lie between -3 and +3.

Table 4: Descriptive statistics SSI, EW, HW & EC 2006

Descriptive Statistics 2006

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SSI2006	579	5,0	6,9	6,027	,4477	-,276	,102	-,228	,203
EW@2006	579	2,3	4,3	3,122	,3911	1,222	,102	3,671	,203
HW@2006	579	7,8	8,9	8,270	,3160	,647	,102	-,107	,203
EC@2006	579	4,3	8,1	6,718	1,0692	-,796	,102	-,509	,203
Resource_Use	579	,00	98,91	35,9793	34,54057	,373	,102	-1,376	,203
Emmision	579	,00	99,35	36,3439	35,36222	,352	,102	-1,428	,203
Environmental_Innovation	579	,00	97,92	9,1863	21,05451	2,276	,102	4,421	,203
Workforce	579	,00	99,58	64,8982	26,94812	-,673	,102	-,549	,203
Human_Right	579	,00	98,28	17,1197	29,36765	1,508	,102	,815	,203
Community	579	,00	99,46	35,9423	31,57673	,421	,102	-1,127	,203
Product_Responsibility	579	,00	98,33	22,9684	30,95367	1,092	,102	-,144	,203
Management	579	,16	99,84	49,9168	29,34414	,029	,102	-1,228	,203
Shareholders	579	,16	99,84	53,0037	28,01142	-,059	,102	-1,149	,203
CSR_Strategy	579	,00	99,09	27,7021	33,60581	,788	,102	-,918	,203
Region=NE	579	,00	1,00	,5026	,50043	-,010	,102	-2,007	,203
Region=SE	579	,00	1,00	,1520	,35932	1,944	,102	1,784	,203
Region=WE	579	,00	1,00	,3454	,47592	,652	,102	-1,581	,203
Industrynaam=Construction	579	,00	1,00	,0415	,19950	4,613	,102	19,345	,203
Industrynaam=Finance, Insurance and Real Estate	579	,00	1,00	,2211	,41533	1,348	,102	-,184	,203
Industrynaam=Manufacturing	579	,00	1,00	,3558	,47916	,604	,102	-1,641	,203
Industrynaam=Mining	579	,00	1,00	,0484	,21471	4,222	,102	15,877	,203
Industrynaam=Retail Trade	579	,00	1,00	,0708	,25673	3,355	,102	9,289	,203
Industrynaam=Services	579	,00	1,00	,1054	,30727	2,578	,102	4,660	,203
Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	579	,00	1,00	,1382	,34538	2,103	,102	2,429	,203
Industrynaam=Wholesale Trade	579	,00	1,00	,0190	,13664	7,065	,102	48,080	,203
Valid N (listwise)	579								

Table 5: Descriptive statistics SSI, EW, HW & EC 2011

Descriptive Statistics 2011

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SSI@2011	783	5,1	7,1	5,857	,4814	1,262	,087	,906	,175
EW@2011	783	2,3	4,6	3,632	,5287	-,555	,087	,179	,175
HW@2011	783	6,9	8,9	8,251	,3757	-1,134	,087	3,148	,175
EC@2011	783	3,5	8,4	5,644	1,2830	1,099	,087	-,012	,175
Resource_Use	783	,00	99,75	55,0260	32,43612	-,361	,087	-1,163	,175
Emmision	783	,00	99,69	55,5696	31,50380	-,424	,087	-1,069	,175
Environmental_Innovation	783	,00	99,50	30,8021	33,42521	,579	,087	-1,174	,175
Workforce	783	,00	99,74	67,4015	25,25060	-,756	,087	-,213	,175
Human_Right	783	,00	99,04	33,8079	35,85642	,485	,087	-1,384	,175
Community	783	,00	99,81	47,9433	31,68355	,038	,087	-1,368	,175
Product_Responsibility	783	,00	99,51	47,5766	34,26506	-,096	,087	-1,426	,175
Management	783	,16	99,84	51,7986	28,75528	-,049	,087	-1,198	,175
Shareholders	783	,47	99,53	52,3436	28,73758	-,107	,087	-1,203	,175
CSR_Strategy	783	,00	98,18	44,1024	31,68775	,061	,087	-1,325	,175
Region=EE	783	,00	1,00	,0421	,20105	4,566	,087	18,899	,175
Region=NE	783	,00	1,00	,4470	,49750	,214	,087	-1,959	,175
Region=SE	783	,00	1,00	,1699	,37575	1,762	,087	1,107	,175
Region=WE	783	,00	1,00	,3410	,47435	,672	,087	-1,552	,175
Industrynaam=Construction	783	,00	1,00	,0421	,20105	4,566	,087	18,899	,175
Industrynaam=Finance, Insurance and Real Estate	783	,00	1,00	,2299	,42103	1,286	,087	-,346	,175
Industrynaam=Manufacturing	783	,00	1,00	,3397	,47392	,678	,087	-1,544	,175
Industrynaam=Mining	783	,00	1,00	,0626	,24236	3,619	,087	11,125	,175
Industrynaam=Retail Trade	783	,00	1,00	,0651	,24692	3,531	,087	10,497	,175
Industrynaam=Services	783	,00	1,00	,0971	,29623	2,727	,087	5,453	,175
Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	783	,00	1,00	,1443	,35164	2,028	,087	2,119	,175
Industrynaam=Wholesale Trade	783	,00	1,00	,0192	,13716	7,029	,087	47,530	,175
Valid N (listwise)	783								

Table 6: Descriptive statistics SSI, EW, HW & EC 2016

Descriptive Statistics 2016

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SSI	971	5,2	7,3	6,038	,4987	1,158	,078	,725	,157
EW	971	2,66	5,21	4,2612	,64750	-,503	,078	-,488	,157
HW	971	6,94	9,00	8,4417	,38970	-1,861	,078	2,989	,157
EC	971	3,00	8,50	5,4120	1,36592	,978	,078	-,095	,157
Resource_Use	971	,0	99,8	54,290	32,6444	-,365	,078	-1,186	,157
Emmision	971	,0	99,8	56,596	30,4150	-,416	,078	-,952	,157
Environmental_Innovation	971	,0	99,8	32,518	33,2053	,461	,078	-1,248	,157
Workforce	971	,0	99,9	69,642	25,9238	-1,114	,078	,546	,157
Human_Right	971	,0	99,0	43,600	36,2508	,058	,078	-1,561	,157
Community	971	,0	99,8	49,503	33,2662	-,025	,078	-1,456	,157
Product_Responsibility	971	,0	99,7	55,013	32,6933	-,381	,078	-1,118	,157
Management	971	,1	99,9	50,941	28,8598	-,026	,078	-1,203	,157
Shareholders	971	,4	99,9	51,666	28,7488	-,072	,078	-1,191	,157
CSR_Strategy	971	,0	99,4	46,019	31,0923	,000	,078	-1,278	,157
Region=EE	971	,00	1,00	,0412	,19884	4,624	,078	19,424	,157
Region=NE	971	,00	1,00	,4892	,50014	,043	,078	-2,002	,157
Region=SE	971	,00	1,00	,1514	,35861	1,948	,078	1,799	,157
Region=WE	971	,00	1,00	,3182	,46603	,782	,078	-1,392	,157
Industrynaam=Construction	971	,00	1,00	,0360	,18650	4,986	,078	22,904	,157
Industrynaam=Finance, Insurance and Real Estate	971	,00	1,00	,2606	,43916	1,093	,078	-,808	,157
Industrynaam=Manufacturing	971	,00	1,00	,3203	,46683	,772	,078	-1,408	,157
Industrynaam=Mining	971	,00	1,00	,0566	,23128	3,842	,078	12,787	,157
Industrynaam=Retail Trade	971	,00	1,00	,0669	,25005	3,471	,078	10,068	,157
Industrynaam=Services	971	,00	1,00	,1030	,30410	2,616	,078	4,856	,157
Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	971	,00	1,00	,1380	,34508	2,102	,078	2,425	,157
Industrynaam=Wholesale Trade	971	,00	1,00	,0185	,13495	7,150	,078	49,223	,157
Valid N (listwise)	971								

Appendix 2: Checking assumptions

This appendix shows that for all the 12 regression analyses performed the assumptions are met. For each year 4 regression analysis were performed (overall SSI, HW, EW and EC). This appendix is structured according to the assumptions that must be met: 1) linearity, 2) homoscedasticity, 3) independence of the error terms, 4) normality of the error term distribution and 5) multicollinearity.

Assumption 1: Linearity

To check if the regression model is linear, the scatterplot based on ZRESID (the standard residuals, or errors) and ZPRED (the standardized predicted values of the dependent variable based on the model) was investigated (see homoscedasticity). If there is a linear relationship in this model, the dots do not form a clear pattern: all the positive and negative residuals are spread around the horizontal zero-line. Since the scatterplots are showing a pattern, and this shows the models does not seem to be linear. The polynomial terms are therefore included in the model to look at non-linearity. If the polynomial terms were significant (see numbers marked in red), those polynomial term were included in the final regression analysis as it improves the linearity.

Table 7:Polynomal check SSI 2016

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	6,154	,056		109,935	,000					
	RU_Cent	,002	,002	,135	1,270	,204	-,079	,042	,041	,091	11,015
	RU_2	8,501E-6	,000	,016	,320	,749	,018	,011	,010	,425	2,353
	RU_3	-5,147E-7	,000	-,065	-,632	,528	-,080	-,021	-,020	,095	10,519
	Emmision_cent	,000	,002	-,027	-,281	,779	-,138	-,009	-,009	,110	9,110
	Emmision_2	-5,977E-5	,000	-,104	-2,109	,035	-,016	-,070	-,067	,420	2,379
	Emmision_3	-9,806E-7	,000	-,115	-1,209	,227	-,131	-,040	-,039	,113	8,821
	EI_Cent	-,001	,001	-,047	-,516	,606	-,014	-,017	-,016	,125	7,971
	EI_2	-9,338E-5	,000	-,178	-2,309	,021	-,052	-,077	-,074	,172	5,816
	EI_3	1,549E-6	,000	,226	1,717	,086	-,022	,057	,055	,059	16,942
	Workforce_Cent	-,005	,002	-,209	-2,979	,003	-,162	-,099	-,095	,208	4,815
	Workforce_2	,000	,000	-,235	-2,806	,005	,010	-,093	-,090	,145	6,893
	Workforce_3	-1,323E-6	,000	-,132	-1,272	,204	-,085	-,042	-,041	,095	10,498
	HR_Cent	,001	,002	,070	,631	,528	-,033	,021	,020	,083	12,070
	HR_2	4,456E-5	,000	,078	1,974	,049	,055	,066	,063	,656	1,525
	HR_3	-2,948E-7	,000	-,042	-,363	,716	-,032	-,012	-,012	,077	12,922
	Community_Cent	,000	,001	,027	,286	,775	-,017	,010	,009	,115	8,703
	Community_2	-1,671E-5	,000	-,026	-,774	,439	-,047	-,026	-,025	,885	1,130
	Community_3	4,310E-7	,000	,049	,518	,605	-,021	,017	,017	,112	8,946
	PR_Cent	-,002	,001	-,144	-1,535	,125	-,093	-,051	-,049	,116	8,586
	PR_2	-4,655E-7	,000	-,001	-,020	,984	-,024	-,001	-,001	,483	2,072
	PR_3	8,107E-7	,000	,113	1,083	,279	-,061	,036	,035	,094	10,615
	Management_Cent	,000	,001	-,018	-,224	,823	-,022	-,007	-,007	,158	6,343
	Management_2	6,130E-6	,000	,009	,267	,790	,007	,009	,009	,932	1,073
	Management_3	4,441E-7	,000	,040	,496	,620	-,018	,016	,016	,157	6,373
	Shareholders_Cent	,000	,001	,013	,159	,874	-,016	,005	,005	,154	6,508
	Shareholders_2	-4,747E-6	,000	-,007	-,212	,832	-,011	-,007	-,007	,963	1,038
	Shareholders_3	-2,529E-7	,000	-,023	-,280	,780	-,014	-,009	-,009	,152	6,591
	CSRS_Cent	,001	,001	,055	,611	,541	-,064	,020	,020	,126	7,936
	CSRS_2	4,952E-5	,000	,080	2,077	,038	,069	,069	,066	,687	1,455
	CSRS_3	-7,542E-7	,000	-,082	-,928	,354	-,064	-,031	-,030	,131	7,632

a. Dependent Variable: SSI

Table 8: Polynomal check SSI 2011

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	5,945	,062		95,215	,000					
	RU_Cent	,001	,002	,063	,491	,624	-,020	,018	,017	,075	13,274
	RU_2	2,612E-6	,000	,005	,096	,923	,001	,004	,003	,426	2,346
	RU_3	-6,462E-7	,000	-,091	-,747	,455	-,020	-,027	-,026	,084	11,892
	Emmision_Cent	,001	,002	,040	,325	,745	-,015	,012	,011	,083	12,081
	Emmision_2	-8,926E-5	,000	-,175	-3,173	,002	-,073	-,115	-,112	,408	2,453
	Emmision_3	-7,064E-7	,000	-,096	-,835	,404	-,008	-,030	-,029	,094	10,689
	EI_Cent	,003	,001	,213	2,264	,024	,048	,082	,080	,140	7,165
	EI_2	-1,401E-5	,000	-,030	-,312	,755	-,046	-,011	-,011	,138	7,261
	EI_3	-7,980E-7	,000	-,129	-,854	,393	-,005	-,031	-,030	,054	18,374
	Workforce_Cent	-,005	,002	-,260	-2,956	,003	-,069	-,107	-,104	,160	6,243
	Workforce_2	2,526E-5	,000	,044	,507	,612	,024	,018	,018	,163	6,142
	Workforce_3	1,187E-6	,000	,136	1,173	,241	-,038	,043	,041	,092	10,842
	HR_Cent	,004	,001	,270	2,487	,013	,080	,090	,087	,105	9,524
	HR_2	-2,543E-5	,000	-,054	-,609	,543	,013	-,022	-,021	,155	6,434
	HR_3	-1,914E-7	,000	-,033	-,215	,830	,048	-,008	-,008	,052	19,343
	Community_Cent	,001	,001	,087	,906	,365	,000	,033	,032	,133	7,500
	Community_2	1,352E-5	,000	,022	,583	,560	,014	,021	,021	,835	1,198
	Community_3	-9,748E-7	,000	-,114	-1,187	,236	-,011	-,043	-,042	,135	7,429
	PR_Cent	-,002	,002	-,118	-1,036	,301	-,059	-,038	-,036	,095	10,476
	PR_2	-1,319E-5	,000	-,024	-,651	,515	-,034	-,024	-,023	,880	1,136
	PR_3	4,226E-7	,000	,059	,527	,599	-,049	,019	,019	,099	10,070
	Management_Cent	-,001	,002	-,084	-,933	,351	-,019	-,034	-,033	,153	6,556
	Management_2	1,535E-5	,000	,024	,638	,524	,018	,023	,022	,903	1,107
	Management_3	8,370E-7	,000	,081	,895	,371	-,008	,033	,031	,150	6,669
	Shareholders_Cent	,001	,001	,043	,488	,626	-,012	,018	,017	,156	6,416
	Shareholders_2	6,962E-6	,000	,011	,286	,775	,007	,010	,010	,886	1,128
	Shareholders_3	-6,595E-7	,000	-,064	-,711	,478	-,019	-,026	-,025	,153	6,551
	CSRS_Cent	-2,947E-5	,002	-,002	-,018	,985	-,001	-,001	-,001	,110	9,064
	CSRS_2	3,552E-5	,000	,061	1,407	,160	,047	,051	,049	,656	1,524
	CSRS_3	-6,383E-8	,000	-,008	-,075	,940	,005	-,003	-,003	,119	8,416

a. Dependent Variable: SSI@2011

Table 9: Polynomal check SSI 2006

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	6,024	,123		49,012	,000					
	RU_Cent	-,001	,002	-,056	-,435	,664	-,033	-,019	-,018	,103	9,692
	RU_2	-2,142E-5	,000	-,045	-,549	,583	,003	-,023	-,023	,256	3,905
	RU_3	8,163E-7	,000	,135	,837	,403	-,012	,036	,035	,066	15,134
	Emmision_Cent	-,001	,002	-,093	-,674	,500	-,034	-,029	-,028	,090	11,165
	Emmision_2	-1,736E-5	,000	-,037	-,436	,663	,010	-,019	-,018	,241	4,149
	Emmision_3	9,076E-7	,000	,156	,905	,366	-,008	,039	,038	,058	17,204
	EI_Cent	-,007	,005	-,307	-1,218	,224	-,047	-,052	-,051	,027	36,860
	EI_2	,000	,000	,694	,945	,345	-,030	,040	,039	,003	313,013
	EI_3	-2,287E-6	,000	-,440	-,828	,408	-,023	-,035	-,034	,006	164,028
	Workforce_Cent	,000	,002	,021	,216	,829	-,066	,009	,009	,182	5,501
	Workforce_2	,000	,000	-,278	-2,951	,003	-,018	-,125	-,122	,194	5,154
	Workforce_3	-2,564E-6	,000	-,328	-2,446	,015	-,053	-,104	-,102	,096	10,456
	HR_Cent	,002	,002	,155	1,332	,183	-,012	,057	,055	,128	7,833
	HR_2	-6,587E-5	,000	-,213	-,581	,562	-,018	-,025	-,024	,013	78,073
	HR_3	4,306E-7	,000	,106	,328	,743	-,017	,014	,014	,016	61,341
	Community_Cent	-,002	,002	-,149	-1,328	,185	,034	-,057	-,055	,136	7,328
	Community_2	-5,994E-5	,000	-,125	-1,641	,101	,043	-,070	-,068	,297	3,363
	Community_3	2,309E-6	,000	,346	2,450	,015	,067	,104	,102	,086	11,590
	PR_Cent	-,002	,001	-,135	-1,393	,164	-,055	-,059	-,058	,184	5,430
	PR_2	1,842E-6	,000	,005	,023	,982	-,016	,001	,001	,032	31,209
	PR_3	4,147E-7	,000	,091	,333	,739	-,025	,014	,014	,023	42,998
	Management_Cent	,000	,002	,024	,221	,825	,018	,009	,009	,142	7,065
	Management_2	-8,243E-7	,000	-,001	-,032	,975	,011	-,001	-,001	,890	1,124
	Management_3	8,901E-8	,000	,010	,087	,930	,020	,004	,004	,141	7,083
	Shareholders_Cent	,000	,002	-,014	-,136	,892	-,001	-,006	-,006	,169	5,914
	Shareholders_2	7,410E-6	,000	,012	,274	,784	,027	,012	,011	,903	1,108
	Shareholders_3	-8,590E-8	,000	-,009	-,084	,933	,005	-,004	-,003	,166	6,041
	CSRS_Cent	-,002	,001	-,123	-1,104	,270	-,070	-,047	-,046	,139	7,217
	CSRS_2	8,079E-5	,000	,214	1,240	,216	-,016	,053	,051	,058	17,256
	CSRS_3	-7,924E-7	,000	-,161	-,715	,475	-,038	-,031	-,030	,034	29,565

a. Dependent Variable: SSI2006

Table 10: Polynomal check EW 2016

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4,241	,073		58,080	,000					
	RU_Cent	-,002	,002	-,078	-,730	,466	-,079	-,024	-,024	,091	11,015
	RU_2	2,931E-5	,000	,042	,846	,398	,021	,028	,027	,425	2,353
	RU_3	5,061E-7	,000	,050	,476	,634	-,054	,016	,015	,095	10,519
	Emmision_cent	-,005	,002	-,236	-2,424	,016	-,053	-,080	-,078	,110	9,110
	Emmision_2	-2,315E-6	,000	-,003	-,063	,950	-,058	-,002	-,002	,420	2,379
	Emmision_3	2,691E-6	,000	,243	2,542	,011	,009	,084	,082	,113	8,821
	EI_Cent	-,005	,002	-,247	-2,718	,007	-,127	-,090	-,088	,125	7,971
	EI_2	-2,604E-5	,000	-,038	-,493	,622	-,034	-,016	-,016	,172	5,816
	EI_3	1,444E-6	,000	,163	1,227	,220	-,084	,041	,040	,059	16,942
	Workforce_Cent	,001	,002	,036	,504	,615	-,014	,017	,016	,208	4,815
	Workforce_2	-9,596E-5	,000	-,114	-1,349	,178	-,057	-,045	-,043	,145	6,893
	Workforce_3	-1,220E-6	,000	-,094	-,900	,369	,022	-,030	-,029	,095	10,498
	HR_Cent	-,002	,002	-,121	-1,077	,282	-,108	-,036	-,035	,083	12,070
	HR_2	-1,071E-5	,000	-,014	-,364	,716	-,045	-,012	-,012	,656	1,525
	HR_3	5,772E-8	,000	,006	,055	,957	-,103	,002	,002	,077	12,922
	Community_Cent	,002	,002	,085	,893	,372	-,059	,030	,029	,115	8,703
	Community_2	3,150E-5	,000	,038	1,119	,263	,013	,037	,036	,885	1,130
	Community_3	-1,025E-6	,000	-,091	-,944	,346	-,065	-,031	-,030	,112	8,946
	PR_Cent	,000	,002	-,013	-,138	,890	-,008	-,005	-,004	,116	8,586
	PR_2	5,619E-5	,000	,084	1,810	,071	,033	,060	,058	,483	2,072
	PR_3	1,041E-6	,000	,112	1,066	,287	-,006	,035	,034	,094	10,615
	Management_Cent	-,001	,002	-,064	-,788	,431	,025	-,026	-,025	,158	6,343
	Management_2	-3,863E-6	,000	-,004	-,129	,898	-,014	-,004	-,004	,932	1,073
	Management_3	1,347E-6	,000	,094	1,152	,250	,037	,038	,037	,157	6,373
	Shareholders_Cent	,001	,002	,029	,350	,726	,030	,012	,011	,154	6,508
	Shareholders_2	-4,759E-6	,000	-,005	-,163	,871	-,015	-,005	-,005	,963	1,038
	Shareholders_3	5,116E-8	,000	,004	,043	,965	,031	,001	,001	,152	6,591
	CSRS_Cent	,003	,002	,154	1,692	,091	,007	,056	,055	,126	7,936
	CSRS_2	3,959E-7	,000	,000	,013	,990	-,029	,000	,000	,687	1,455
	CSRS_3	-5,287E-7	,000	-,044	-,499	,618	,008	-,017	-,016	,131	7,632

a. Dependent Variable: EW

Table 11: Polynomal check EW 2011

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3,511	,069		50,556	,000					
	RU_Cent	,002	,002	,136	1,044	,297	-,021	,038	,037	,075	13,274
	RU_2	4,564E-5	,000	,082	1,511	,131	,062	,055	,054	,426	2,346
	RU_3	-8,010E-7	,000	-,102	-,833	,405	-,039	-,030	-,030	,084	11,892
	Emmision_Cent	-,003	,002	-,151	-1,221	,222	-,010	-,044	-,043	,083	12,081
	Emmision_2	4,436E-5	,000	,079	1,418	,157	,030	,052	,050	,408	2,453
	Emmision_3	2,026E-6	,000	,251	2,153	,032	,008	,078	,077	,094	10,689
	EI_Cent	,000	,002	-,015	-,156	,876	-,057	-,006	-,006	,140	7,165
	EI_2	9,151E-6	,000	,018	,183	,855	-,038	,007	,007	,138	7,261
	EI_3	-5,294E-7	,000	-,078	-,510	,610	-,057	-,019	-,018	,054	18,374
	Workforce_Cent	-,001	,002	-,049	-,554	,580	-,025	-,020	-,020	,160	6,243
	Workforce_2	-5,377E-5	,000	-,086	-,970	,332	-,003	-,035	-,035	,163	6,142
	Workforce_3	-3,165E-7	,000	-,033	-,281	,779	-,013	-,010	-,010	,092	10,842
	HR_Cent	,000	,002	,018	,162	,871	-,073	,006	,006	,105	9,524
	HR_2	7,245E-5	,000	,141	1,560	,119	-,028	,057	,056	,155	6,434
	HR_3	-1,520E-6	,000	-,240	-1,534	,126	-,069	-,056	-,055	,052	19,343
	Community_Cent	,003	,002	,176	1,803	,072	-,004	,066	,064	,133	7,500
	Community_2	-2,034E-5	,000	-,031	-,788	,431	-,023	-,029	-,028	,835	1,198
	Community_3	-1,461E-6	,000	-,155	-1,599	,110	-,030	-,058	-,057	,135	7,429
	PR_Cent	,003	,002	,209	1,814	,070	,028	,066	,065	,095	10,476
	PR_2	4,470E-5	,000	,075	1,984	,048	,074	,072	,071	,880	1,136
	PR_3	-1,100E-6	,000	-,139	-1,232	,218	,013	-,045	-,044	,099	10,070
	Management_Cent	-,001	,002	-,028	-,305	,761	,011	-,011	-,011	,153	6,556
	Management_2	-3,989E-6	,000	-,006	-,149	,882	-,010	-,005	-,005	,903	1,107
	Management_3	6,062E-7	,000	,054	,583	,560	,019	,021	,021	,150	6,669
	Shareholders_Cent	,000	,002	-,009	-,103	,918	-,010	-,004	-,004	,156	6,416
	Shareholders_2	8,316E-6	,000	,012	,307	,759	,016	,011	,011	,886	1,128
	Shareholders_3	1,089E-7	,000	,010	,105	,916	-,006	,004	,004	,153	6,551
	CSRS_Cent	,001	,002	,062	,578	,563	-,024	,021	,021	,110	9,064
	CSRS_2	-1,627E-5	,000	-,025	-,579	,563	-,024	-,021	-,021	,656	1,524
	CSRS_3	-4,582E-7	,000	-,050	-,485	,628	-,036	-,018	-,017	,119	8,416

a. Dependent Variable: EW@2011

Table 12: Polynomal check EW 2006

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3,142	,108		29,215	,000					
	RU_Cent	-,001	,001	-,126	-,971	,332	-,016	-,041	-,040	,103	9,692
	RU_2	-3,279E-5	,000	-,079	-,961	,337	-,002	-,041	-,040	,256	3,905
	RU_3	9,645E-7	,000	,183	1,130	,259	,003	,048	,047	,066	15,134
	Emmision_Cent	-,001	,002	-,117	-,841	,401	-,010	-,036	-,035	,090	11,165
	Emmision_2	-2,953E-5	,000	-,072	-,847	,397	-,011	-,036	-,035	,241	4,149
	Emmision_3	9,236E-7	,000	,181	1,052	,293	,000	,045	,044	,058	17,204
	EI_Cent	-,003	,005	-,152	-,604	,546	-,036	-,026	-,025	,027	36,860
	EI_2	4,029E-5	,000	,115	,157	,875	-,014	,007	,007	,003	313,013
	EI_3	1,170E-7	,000	,026	,048	,961	-,002	,002	,002	,006	164,028
	Workforce_Cent	-,001	,001	-,052	-,536	,592	-,042	-,023	-,022	,182	5,501
	Workforce_2	-5,598E-5	,000	-,125	-1,328	,185	-,011	-,057	-,055	,194	5,154
	Workforce_3	-8,671E-7	,000	-,127	-,945	,345	-,025	-,040	-,039	,096	10,456
	HR_Cent	-,001	,002	-,112	-,963	,336	-,031	-,041	-,040	,128	7,833
	HR_2	,000	,000	,700	1,905	,057	-,016	,081	,079	,013	78,073
	HR_3	-2,259E-6	,000	-,639	-1,963	,050	-,024	-,084	-,082	,016	61,341
	Community_Cent	-,002	,001	-,157	-1,393	,164	,036	-,059	-,058	,136	7,328
	Community_2	-9,974E-5	,000	-,238	-3,119	,002	-,029	-,132	-,130	,297	3,363
	Community_3	2,337E-6	,000	,401	2,834	,005	,046	,120	,118	,086	11,590
	PR_Cent	-,001	,001	-,065	-,669	,504	,020	-,029	-,028	,184	5,430
	PR_2	-1,669E-5	,000	-,055	-,239	,811	,058	-,010	-,010	,032	31,209
	PR_3	7,560E-7	,000	,189	,694	,488	,052	,030	,029	,023	42,998
	Management_Cent	-,001	,001	-,058	-,526	,599	-,036	-,022	-,022	,142	7,065
	Management_2	1,668E-5	,000	,032	,732	,465	,026	,031	,030	,890	1,124
	Management_3	9,737E-9	,000	,001	,011	,991	-,031	,000	,000	,141	7,083
	Shareholders_Cent	,001	,001	,043	,427	,669	-,025	,018	,018	,169	5,914
	Shareholders_2	1,052E-5	,000	,019	,444	,657	,042	,019	,018	,903	1,108
	Shareholders_3	-6,346E-7	,000	-,073	-,711	,477	-,031	-,030	-,030	,166	6,041
	CSRS_Cent	,000	,001	-,036	-,326	,744	-,011	-,014	-,014	,139	7,217
	CSRS_2	-1,793E-5	,000	-,054	-,314	,753	-,006	-,013	-,013	,058	17,256
	CSRS_3	5,098E-7	,000	,119	,525	,599	-,002	,022	,022	,034	29,565

a. Dependent Variable: EW@2006

Table 13: Polynomal check HW 2016

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	8,464	,045		189,304	,000					
	RU_Cent	-,001	,001	-,045	-,414	,679	-,008	-,014	-,014	,091	11,015
	RU_2	1,096E-5	,000	,026	,517	,605	-,007	,017	,017	,425	2,353
	RU_3	3,205E-7	,000	,052	,493	,622	-,001	,016	,016	,095	10,519
	Emmision_cent	4,631E-5	,001	,003	,035	,972	-,029	,001	,001	,110	9,110
	Emmision_2	-2,833E-5	,000	-,063	-1,251	,211	-,039	-,042	-,041	,420	2,379
	Emmision_3	-4,652E-7	,000	-,070	-,718	,473	-,018	-,024	-,023	,113	8,821
	EI_Cent	,001	,001	,079	,855	,393	,015	,028	,028	,125	7,971
	EI_2	-5,215E-6	,000	-,013	-,161	,872	-,011	-,005	-,005	,172	5,816
	EI_3	-1,695E-7	,000	-,032	-,235	,814	,002	-,008	-,008	,059	16,942
	Workforce_Cent	-,002	,001	-,093	-1,306	,192	-,035	-,043	-,043	,208	4,815
	Workforce_2	-3,539E-5	,000	-,070	-,813	,417	-,021	-,027	-,027	,145	6,893
	Workforce_3	-4,581E-8	,000	-,006	-,055	,956	-,001	-,002	-,002	,095	10,498
	HR_Cent	,001	,001	,110	,968	,333	,079	,032	,032	,083	12,070
	HR_2	1,307E-5	,000	,029	,725	,469	,047	,024	,024	,656	1,525
	HR_3	3,169E-7	,000	,057	,489	,625	,083	,016	,016	,077	12,922
	Community_Cent	-,002	,001	-,157	-1,627	,104	-,028	-,054	-,053	,115	8,703
	Community_2	5,135E-7	,000	,001	,030	,976	-,009	,001	,001	,885	1,130
	Community_3	6,890E-7	,000	,101	1,036	,300	-,011	,034	,034	,112	8,946
	PR_Cent	-,002	,001	-,138	-1,442	,150	-,081	-,048	-,047	,116	8,586
	PR_2	-2,087E-6	,000	-,005	-,110	,913	,004	-,004	-,004	,483	2,072
	PR_3	1,608E-7	,000	,029	,269	,788	-,065	,009	,009	,094	10,615
	Management_Cent	,000	,001	,009	,114	,909	,012	,004	,004	,158	6,343
	Management_2	-4,128E-7	,000	-,001	-,022	,982	-,009	-,001	-,001	,932	1,073
	Management_3	3,700E-8	,000	,004	,052	,959	,012	,002	,002	,157	6,373
	Shareholders_Cent	,000	,001	,034	,413	,680	,002	,014	,013	,154	6,508
	Shareholders_2	-1,985E-6	,000	-,004	-,111	,912	-,006	-,004	-,004	,963	1,038
	Shareholders_3	-3,334E-7	,000	-,039	-,462	,644	,002	-,015	-,015	,152	6,591
	CSRS_Cent	,000	,001	,035	,378	,706	,025	,013	,012	,126	7,936
	CSRS_2	4,401E-6	,000	,009	,231	,817	,018	,008	,008	,687	1,455
	CSRS_3	1,353E-7	,000	,019	,208	,835	,030	,007	,007	,131	7,632

a. Dependent Variable: HW

Table 14: Polynomal check HW 2011

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	8,333	,049		170,789	,000					
	RU_Cent	-,002	,001	-,150	-1,170	,242	,099	-,043	-,041	,075	13,274
	RU_2	-1,297E-5	,000	-,033	-,611	,541	-,084	-,022	-,022	,426	2,346
	RU_3	1,058E-6	,000	,190	1,566	,118	,119	,057	,055	,084	11,892
	Emmision_Cent	,002	,001	,197	1,606	,109	,095	,058	,057	,083	12,081
	Emmision_2	-3,158E-5	,000	-,079	-1,437	,151	-,075	-,052	-,051	,408	2,453
	Emmision_3	-1,073E-6	,000	-,187	-1,623	,105	,081	-,059	-,057	,094	10,689
	EI_Cent	,001	,001	,115	1,221	,223	,119	,044	,043	,140	7,165
	EI_2	-1,321E-5	,000	-,036	-,377	,707	,042	-,014	-,013	,138	7,261
	EI_3	7,767E-8	,000	,016	,106	,915	,091	,004	,004	,054	18,374
	Workforce_Cent	,000	,001	,020	,224	,823	,093	,008	,008	,160	6,243
	Workforce_2	4,215E-5	,000	,094	1,083	,279	-,040	,039	,038	,163	6,142
	Workforce_3	6,952E-7	,000	,102	,879	,380	,077	,032	,031	,092	10,842
	HR_Cent	,001	,001	,106	,980	,327	,134	,036	,034	,105	9,524
	HR_2	-6,968E-5	,000	-,191	-2,136	,033	,021	-,078	-,075	,155	6,434
	HR_3	8,467E-7	,000	,188	1,216	,224	,100	,044	,043	,052	19,343
	Community_Cent	-,001	,001	-,125	-1,296	,196	,024	-,047	-,046	,133	7,500
	Community_2	2,425E-5	,000	,052	1,338	,181	,033	,049	,047	,835	1,198
	Community_3	4,075E-7	,000	,061	,635	,526	,040	,023	,022	,135	7,429
	PR_Cent	-,001	,001	-,121	-1,061	,289	-,012	-,039	-,037	,095	10,476
	PR_2	-1,229E-5	,000	-,029	-,777	,438	-,031	-,028	-,027	,880	1,136
	PR_3	1,716E-8	,000	,003	,027	,978	-,010	,001	,001	,099	10,070
	Management_Cent	,000	,001	-,021	-,238	,812	-,003	-,009	-,008	,153	6,556
	Management_2	2,503E-6	,000	,005	,133	,894	,011	,005	,005	,903	1,107
	Management_3	-7,047E-8	,000	-,009	-,096	,923	-,001	-,004	-,003	,150	6,669
	Shareholders_Cent	,000	,001	,013	,141	,888	,006	,005	,005	,156	6,416
	Shareholders_2	-6,337E-6	,000	-,012	-,333	,739	-,017	-,012	-,012	,886	1,128
	Shareholders_3	-1,482E-7	,000	-,018	-,204	,838	,001	-,007	-,007	,153	6,551
	CSRS_Cent	-,001	,001	-,121	-1,138	,255	,047	-,041	-,040	,110	9,064
	CSRS_2	1,680E-5	,000	,037	,852	,395	,013	,031	,030	,656	1,524
	CSRS_3	7,334E-8	,000	,011	,110	,912	,054	,004	,004	,119	8,416

a. Dependent Variable: HW@2011

Table 15: Polynomal check HW 2006

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	8,310	,085		97,393	,000					
	RU_Cent	,000	,001	,025	,200	,842	-,028	,009	,008	,103	9,692
	RU_2	7,335E-7	,000	,002	,027	,978	-,024	,001	,001	,256	3,905
	RU_3	-1,570E-7	,000	-,037	-,232	,817	-,032	-,010	-,009	,066	15,134
	Emmision_Cent	,000	,001	-,053	-,390	,696	-,012	-,017	-,016	,090	11,165
	Emmision_2	-4,897E-6	,000	-,015	-,177	,859	,043	-,008	-,007	,241	4,149
	Emmision_3	5,981E-7	,000	,145	,859	,391	,018	,037	,035	,058	17,204
	EI_Cent	,002	,004	,120	,484	,629	,101	,021	,020	,027	36,860
	EI_2	4,004E-5	,000	,142	,196	,844	,080	,008	,008	,003	313,013
	EI_3	-5,462E-7	,000	-,149	-,285	,776	,063	-,012	-,012	,006	164,028
	Workforce_Cent	,002	,001	,132	1,380	,168	-,041	,059	,056	,182	5,501
	Workforce_2	-3,237E-5	,000	-,090	-,968	,333	,051	-,041	-,040	,194	5,154
	Workforce_3	-1,306E-6	,000	-,237	-1,795	,073	-,076	-,076	-,073	,096	10,456
	HR_Cent	,002	,001	,217	1,904	,057	,021	,081	,078	,128	7,833
	HR_2	,000	,000	-,753	-2,089	,037	,010	-,089	-,085	,013	78,073
	HR_3	1,744E-6	,000	,611	1,911	,057	,018	,081	,078	,016	61,341
	Community_Cent	,000	,001	-,033	-,296	,767	-,073	-,013	-,012	,136	7,328
	Community_2	5,881E-5	,000	,174	2,319	,021	,065	,099	,095	,297	3,363
	Community_3	-7,434E-7	,000	-,158	-1,136	,256	-,043	-,048	-,046	,086	11,590
	PR_Cent	,001	,001	,093	,980	,328	-,014	,042	,040	,184	5,430
	PR_2	-7,130E-5	,000	-,293	-1,285	,199	-,070	-,055	-,052	,032	31,209
	PR_3	4,983E-7	,000	,154	,577	,564	-,054	,025	,024	,023	42,998
	Management_Cent	,000	,001	,028	,259	,796	,028	,011	,011	,142	7,065
	Management_2	-4,631E-6	,000	-,011	-,256	,798	,001	-,011	-,010	,890	1,124
	Management_3	2,829E-7	,000	,043	,400	,689	,032	,017	,016	,141	7,083
	Shareholders_Cent	,000	,001	,031	,317	,751	,007	,014	,013	,169	5,914
	Shareholders_2	1,350E-5	,000	,031	,719	,473	,035	,031	,029	,903	1,108
	Shareholders_3	-1,803E-7	,000	-,026	-,255	,799	,000	-,011	-,010	,166	6,041
	CSRS_Cent	-,002	,001	-,164	-1,498	,135	-,089	-,064	-,061	,139	7,217
	CSRS_2	4,339E-5	,000	,163	,959	,338	-,043	,041	,039	,058	17,256
	CSRS_3	-6,294E-7	,000	-,181	-,818	,414	-,066	-,035	-,033	,034	29,565

a. Dependent Variable: HW@2006

Table 16: Polynomal check EC 2016

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	5,757	,151		38,105	,000					
	RU_Cent	,009	,005	,198	1,887	,059	-,048	,063	,060	,091	11,015
	RU_2	-1,476E-5	,000	-,010	-,206	,837	,012	-,007	-,007	,425	2,353
	RU_3	-2,371E-6	,000	-,111	-1,079	,281	-,063	-,036	-,034	,095	10,519
	Emmision_cent	,004	,004	,081	,849	,396	-,118	,028	,027	,110	9,110
	Emmision_2	,000	,000	-,095	-1,944	,052	,022	-,065	-,061	,420	2,379
	Emmision_3	-5,167E-6	,000	-,221	-2,360	,019	-,143	-,078	-,075	,113	8,821
	EI_Cent	,002	,004	,043	,487	,626	,040	,016	,015	,125	7,971
	EI_2	,000	,000	-,174	-2,280	,023	-,038	-,076	-,072	,172	5,816
	EI_3	3,372E-6	,000	,180	1,385	,166	,015	,046	,044	,059	16,942
	Workforce_Cent	-,013	,004	-,220	-3,169	,002	-,161	-,105	-,100	,208	4,815
	Workforce_2	,000	,000	-,185	-2,226	,026	,044	-,074	-,070	,145	6,893
	Workforce_3	-2,702E-6	,000	-,099	-,963	,336	-,103	-,032	-,030	,095	10,498
	HR_Cent	,004	,004	,103	,936	,350	-,008	,031	,030	,083	12,070
	HR_2	,000	,000	,084	2,155	,031	,068	,072	,068	,656	1,525
	HR_3	-1,259E-6	,000	-,065	-,575	,565	-,010	-,019	-,018	,077	12,922
	Community_Cent	,001	,004	,034	,367	,713	,017	,012	,012	,115	8,703
	Community_2	-8,213E-5	,000	-,047	-1,411	,159	-,055	-,047	-,045	,885	1,130
	Community_3	1,629E-6	,000	,069	,725	,469	,011	,024	,023	,112	8,946
	PR_Cent	-,005	,004	-,112	-1,212	,226	-,075	-,040	-,038	,116	8,586
	PR_2	-5,550E-5	,000	-,039	-,864	,388	-,043	-,029	-,027	,483	2,072
	PR_3	1,230E-6	,000	,063	,609	,543	-,045	,020	,019	,094	10,615
	Management_Cent	,000	,004	,008	,098	,922	-,039	,003	,003	,158	6,343
	Management_2	2,267E-5	,000	,012	,365	,715	,017	,012	,012	,932	1,073
	Management_3	-5,116E-8	,000	-,002	-,021	,983	-,040	-,001	-,001	,157	6,373
	Shareholders_Cent	,000	,004	-,009	-,115	,909	-,032	-,004	-,004	,154	6,508
	Shareholders_2	-7,496E-6	,000	-,004	-,124	,901	-,003	-,004	-,004	,963	1,038
	Shareholders_3	-4,765E-7	,000	-,016	-,195	,845	-,030	-,007	-,006	,152	6,591
	CSRS_Cent	-,001	,004	-,022	-,250	,803	-,081	-,008	-,008	,126	7,936
	CSRS_2	,000	,000	,085	2,235	,026	,085	,074	,071	,687	1,455
	CSRS_3	-1,869E-6	,000	-,074	-,852	,395	-,083	-,028	-,027	,131	7,632

a. Dependent Variable: EC

Table 17: Polynomal check EC 2011

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	5,938	,165		36,064	,000					
	RU_Cent	,002	,005	,053	,418	,676	-,044	,015	,015	,075	13,274
	RU_2	-2,254E-5	,000	-,017	-,315	,753	,003	-,011	-,011	,426	2,346
	RU_3	-2,020E-6	,000	-,106	-,886	,376	-,043	-,032	-,031	,084	11,892
	Emmision_Cent	,002	,005	,055	,455	,649	-,043	,017	,016	,083	12,081
	Emmision_2	,000	,000	-,204	-3,739	,000	-,067	-,135	-,130	,408	2,453
	Emmision_3	-3,294E-6	,000	-,168	-1,476	,140	-,041	-,054	-,051	,094	10,689
	EI_Cent	,008	,004	,213	2,291	,022	,044	,083	,080	,140	7,165
	EI_2	-3,631E-5	,000	-,029	-,307	,759	-,045	-,011	-,011	,138	7,261
	EI_3	-1,910E-6	,000	-,116	-,776	,438	-,006	-,028	-,027	,054	18,374
	Workforce_Cent	-,014	,004	-,274	-3,153	,002	-,094	-,114	-,110	,160	6,243
	Workforce_2	,000	,000	,066	,762	,446	,041	,028	,027	,163	6,142
	Workforce_3	3,422E-6	,000	,147	1,282	,200	-,059	,047	,045	,092	10,842
	HR_Cent	,010	,004	,273	2,540	,011	,081	,092	,088	,105	9,524
	HR_2	-8,040E-5	,000	-,064	-,731	,465	,019	-,027	-,025	,155	6,434
	HR_3	8,418E-10	,000	,000	,000	1,000	,053	,000	,000	,052	19,343
	Community_Cent	,002	,004	,048	,506	,613	-,010	,018	,018	,133	7,500
	Community_2	3,402E-5	,000	,021	,556	,578	,015	,020	,019	,835	1,198
	Community_3	-1,709E-6	,000	-,075	-,789	,430	-,015	-,029	-,027	,135	7,429
	PR_Cent	-,007	,004	-,189	-1,681	,093	-,076	-,061	-,058	,095	10,476
	PR_2	-7,384E-5	,000	-,051	-1,383	,167	-,060	-,050	-,048	,880	1,136
	PR_3	2,434E-6	,000	,127	1,150	,250	-,058	,042	,040	,099	10,070
	Management_Cent	-,003	,004	-,072	-,804	,422	-,026	-,029	-,028	,153	6,556
	Management_2	4,663E-5	,000	,027	,735	,463	,022	,027	,026	,903	1,107
	Management_3	1,873E-6	,000	,068	,760	,448	-,018	,028	,026	,150	6,669
	Shareholders_Cent	,002	,004	,048	,542	,588	-,011	,020	,019	,156	6,416
	Shareholders_2	1,984E-5	,000	,011	,309	,758	,007	,011	,011	,886	1,128
	Shareholders_3	-1,907E-6	,000	-,069	-,779	,436	-,019	-,028	-,027	,153	6,551
	CSRS_Cent	,000	,004	,008	,080	,936	-,006	,003	,003	,110	9,064
	CSRS_2	,000	,000	,070	1,633	,103	,062	,059	,057	,656	1,524
	CSRS_3	1,065E-7	,000	,005	,048	,962	,003	,002	,002	,119	8,416

a. Dependent Variable: EC@2011

Table 18: Polynomal check EC 2006

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	6,651	,293		22,722	,000					
	RU_Cent	-,001	,004	-,031	-,238	,812	-,027	-,010	-,010	,103	9,692
	RU_2	-3,385E-5	,000	-,030	-,365	,716	,010	-,016	-,015	,256	3,905
	RU_3	1,651E-6	,000	,114	,711	,477	-,007	,030	,029	,066	15,134
	Emmision_Cent	-,002	,004	-,065	-,470	,638	-,037	-,020	-,019	,090	11,165
	Emmision_2	-1,825E-5	,000	-,016	-,192	,847	,005	-,008	-,008	,241	4,149
	Emmision_3	1,279E-6	,000	,092	,535	,593	-,016	,023	,022	,058	17,204
	EI_Cent	-,018	,013	-,359	-1,431	,153	-,075	-,061	-,059	,027	36,860
	EI_2	,001	,001	,775	1,059	,290	-,055	,045	,044	,003	313,013
	EI_3	-6,325E-6	,000	-,510	-,961	,337	-,046	-,041	-,040	,006	164,028
	Workforce_Cent	,000	,004	,004	,041	,968	-,056	,002	,002	,182	5,501
	Workforce_2	,000	,000	-,268	-2,851	,005	-,032	-,121	-,118	,194	5,154
	Workforce_3	-5,308E-6	,000	-,285	-2,126	,034	-,035	-,090	-,088	,096	10,456
	HR_Cent	,006	,004	,177	1,527	,127	-,010	,065	,063	,128	7,833
	HR_2	,000	,000	-,308	-,843	,400	-,021	-,036	-,035	,013	78,073
	HR_3	1,835E-6	,000	,190	,586	,558	-,019	,025	,024	,016	61,341
	Community_Cent	-,004	,004	-,128	-1,144	,253	,043	-,049	-,047	,136	7,328
	Community_2	,000	,000	-,119	-1,565	,118	,041	-,067	-,065	,297	3,363
	Community_3	5,219E-6	,000	,328	2,325	,020	,072	,099	,096	,086	11,590
	PR_Cent	-,006	,003	-,175	-1,816	,070	-,073	-,077	-,075	,184	5,430
	PR_2	8,029E-5	,000	,098	,422	,673	-,023	,018	,017	,032	31,209
	PR_3	1,874E-7	,000	,017	,063	,950	-,036	,003	,003	,023	42,998
	Management_Cent	,002	,004	,047	,425	,671	,029	,018	,018	,142	7,065
	Management_2	-1,817E-5	,000	-,013	-,293	,770	,002	-,013	-,012	,890	1,124
	Management_3	-2,541E-8	,000	-,001	-,010	,992	,029	,000	,000	,141	7,083
	Shareholders_Cent	-,002	,004	-,042	-,421	,674	,007	-,018	-,017	,169	5,914
	Shareholders_2	6,148E-7	,000	,000	,010	,992	,009	,000	,000	,903	1,108
	Shareholders_3	6,261E-7	,000	,026	,258	,797	,019	,011	,011	,166	6,041
	CSRS_Cent	-,003	,004	-,089	-,798	,425	-,058	-,034	-,033	,139	7,217
	CSRS_2	,000	,000	,251	1,461	,145	-,005	,062	,060	,058	17,256
	CSRS_3	-2,416E-6	,000	-,206	-,915	,361	-,028	-,039	-,038	,034	29,565

a. Dependent Variable: EC@2006

Assumption 2: Homoscedasticity

Homoscedasticity is mentioned as a constant range of the error terms of an independent variable. The assumption of an equal error is critical to the proper application of a regression analysis (Hair et al., 2005: 171). In case of no mean of error the data will be heteroscedastic. To check of the data is homoscedastic the scatterplots were examined if there was some of a pattern in the residuals. If there is a consistent pattern the variance is not constant. The scatterplots below show no clear pattern such as a triangle or a horn, so it can be concluded that the data is homoscedastic.

Figure 6: Scatterplot SSI 2016

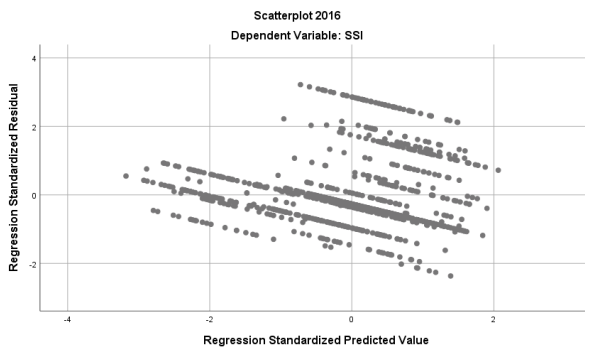


Figure 7: Scatterplot SSI 2011

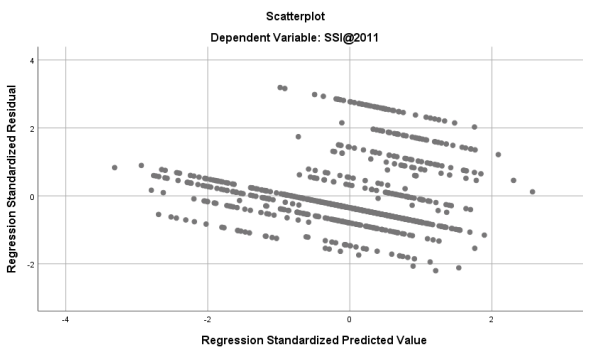


Figure 8: Scatterplot SSI 2006

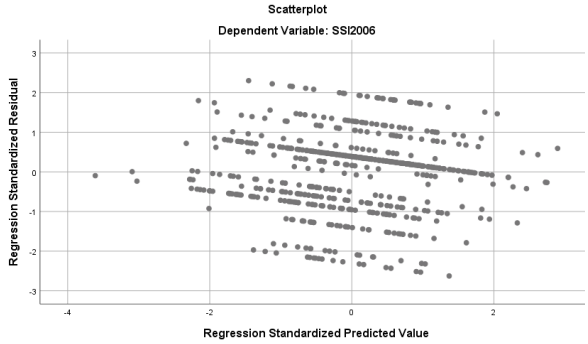


Figure 9: Scatterplot EW 2016

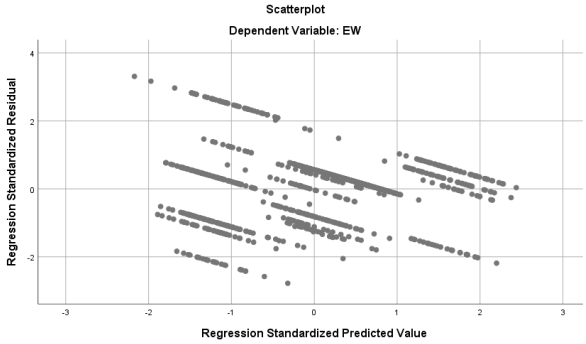


Figure 10: Scatterplot EW 2011

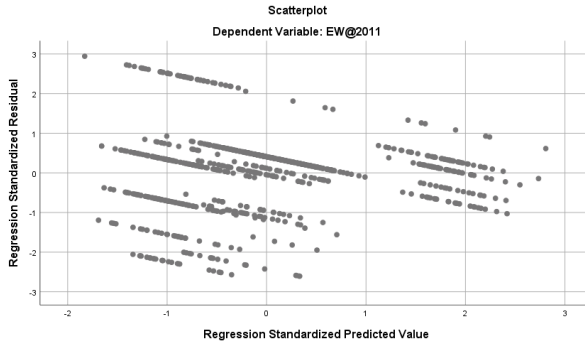


Figure 11: Scatterplot EW 2006

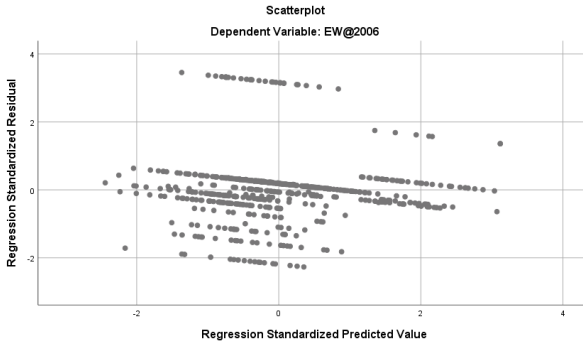


Figure 12: Scatterplot HW 2016

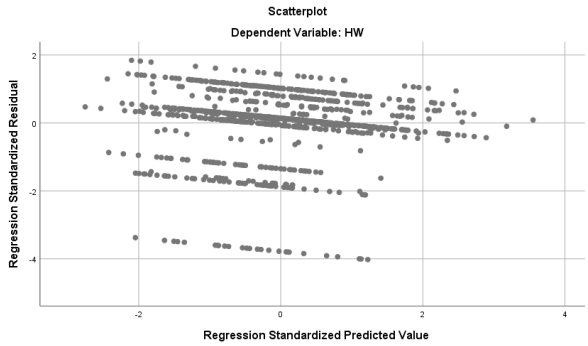


Figure 13: Scatterplot HW 2011

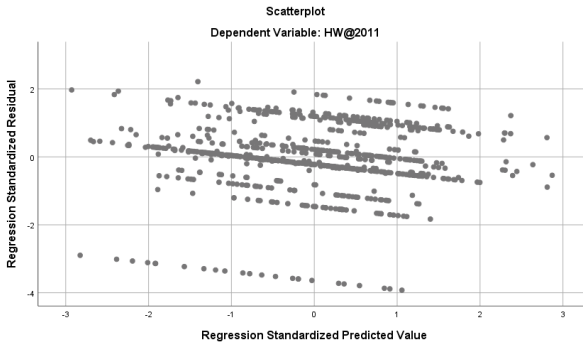


Figure 14: Scatterplot HW 2006

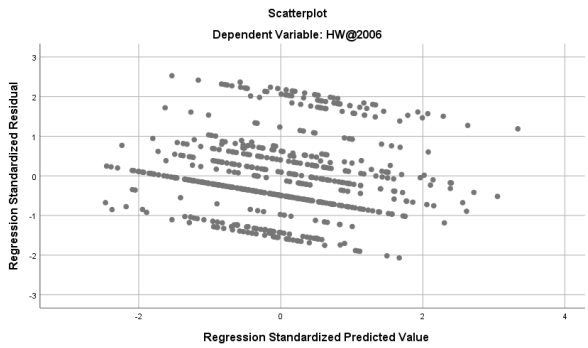


Figure 15: Scatterplot EC 2016

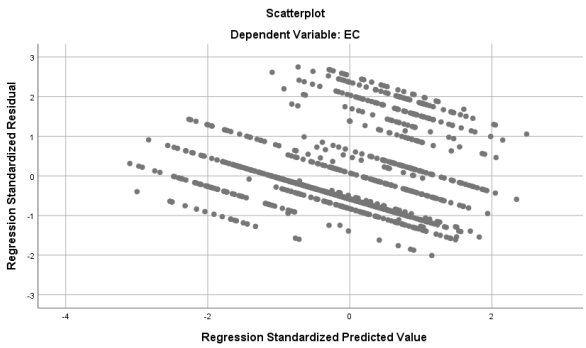


Figure 16: Scatterplot EC 2011

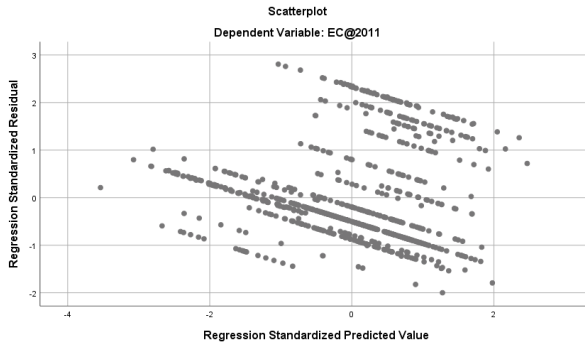
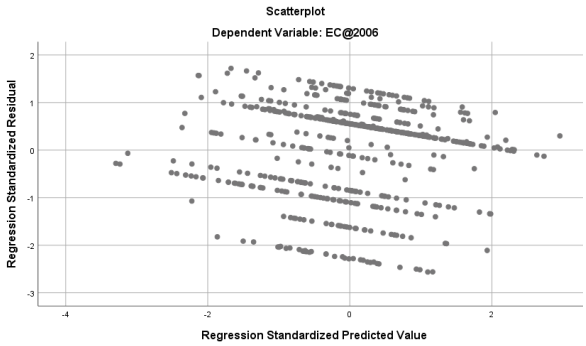


Figure 17: Scatterplot EC 2006



Assumption 3: Independence of the error terms

Another assumption of regression analysis is that each predicted value is independent, which means that the predicted value is not related to any other prediction (Hair et al., 2014). So, the error is that specific part of the variance that cannot be explained by the independent variables. This assumption, no correlation of the error terms with the independent variables, can be checked by using SPSS and looking at the 'residuals statistics'. The Standardized Predicted Value should have a value of 0.0, because the variables are standardized. Besides that, it needs to have a standard deviation of 1.000, which is also the case. This means that the errors do not correlate with the independent variables and thus do not influence the regression model in a significant way. The residual statistics show that all Standardized Predicted Value of 0.0 and the standard deviation is 1.00. This means that the errors do not correlate with the independent variables and thus do not influence the regression model in a significant way.

Figure 18: Residual Statistics SSI 2016

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	5,325	6,501	6,038	,2243	971
Residual	-1,0677	1,4521	,0000	,4454	971
Std. Predicted Value	-3,179	2,061	,000	1,000	971
Std. Residual	-2,366	3,218	,000	,987	971

a. Dependent Variable: SSI

Figure 19: Residual Statistics SSI 2011

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	5,227	6,347	5,857	,1903	783
Residual	-,9874	1,4294	,0000	,4422	783
Std. Predicted Value	-3,311	2,571	,000	1,000	783
Std. Residual	-2,203	3,189	,000	,986	783

a. Dependent Variable: SSI@2011

Figure 20: Residual Statistics SSI 2006

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	5,383	6,472	6,027	,2866	579
Residual	-,9860	1,1275	,0000	,3440	579
Std. Predicted Value	-2,247	1,552	,000	1,000	579
Std. Residual	-2,819	3,223	,000	,983	579

a. Dependent Variable: SSI2006

Figure 21:Residual Statistics EW 2016

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3,4461	5,1765	4,2612	,37558	971
Residual	-1,48261	1,76607	,00000	,52745	971
Std. Predicted Value	-2,170	2,437	,000	1,000	971
Std. Residual	-2,779	3,310	,000	,989	971

a. Dependent Variable: EW

Figure 22: Residual Statistics EW 2011

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3,183	4,321	3,632	,2455	783
Residual	-1,2365	1,3959	,0000	,4683	783
Std. Predicted Value	-1,829	2,807	,000	1,000	783
Std. Residual	-2,607	2,943	,000	,987	783

a. Dependent Variable: EW@2011

Figure 23: Residual Statistics EW 2006

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2,914	3,388	3,122	,0853	579
Residual	-,8805	1,3410	,0000	,3817	579
Std. Predicted Value	-2,443	3,119	,000	1,000	579
Std. Residual	-2,269	3,455	,000	,983	579

a. Dependent Variable: EW@2006

Figure 24: Residual Statistics HW 2016

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	7,5287	8,7098	8,4417	,33538	971
Residual	-,79449	,58093	,00000	,19845	971
Std. Predicted Value	-2,722	,799	,000	1,000	971
Std. Residual	-3,962	2,897	,000	,990	971

a. Dependent Variable: HW

Figure 25: Residual Statistics HW 2011

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	7,492	8,681	8,251	,2877	783
Residual	-,8409	,6409	,0000	,2416	783
Std. Predicted Value	-2,637	1,497	,000	1,000	783
Std. Residual	-3,434	2,617	,000	,986	783

a. Dependent Variable: HW@2011

Figure 26: Residual Statistics HW 2006

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	7,689	8,554	8,270	,2010	579
Residual	-,6622	,7264	,0000	,2438	579
Std. Predicted Value	-2,888	1,413	,000	1,000	579
Std. Residual	-2,666	2,925	,000	,982	579

a. Dependent Variable: HW@2006

Figure 27: Residual Statistics EC 2016

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3,4200	7,0131	5,4120	,64322	971
Residual	-2,45438	3,35644	,00000	1,20499	971
Std. Predicted Value	-3,097	2,489	,000	1,000	971
Std. Residual	-2,009	2,748	,000	,987	971

a. Dependent Variable: EC

Figure 28: Residual Statistics EC 2011

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3,720	6,987	5,644	,5439	783
Residual	-2,3552	3,3063	,0000	1,1621	783
Std. Predicted Value	-3,538	2,469	,000	1,000	783
Std. Residual	-1,999	2,807	,000	,986	783

a. Dependent Variable: EC@2011

Figure 29: Residual Statistics EC 2006

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	5,222	7,794	6,718	,7526	579
Residual	-2,1418	2,0384	,0000	,7594	579
Std. Predicted Value	-1,988	1,430	,000	1,000	579
Std. Residual	-2,773	2,640	,000	,983	579

a. Dependent Variable: EC@2006

Assumption 4: Normality of the error term distribution

To check whether the errors are normally distributed, the Normal probability plot of the standardized residuals is examined. If there is a normal distribution, all the dots will lay on or around the diagonal line (Hair et al., 2014). The figures below show that this is the case for all multiple regression analyses.

Figure 30: Normal P-Plot SSI 2016

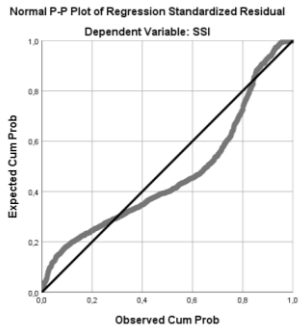


Figure 31: Normal P-Plot SSI 2011

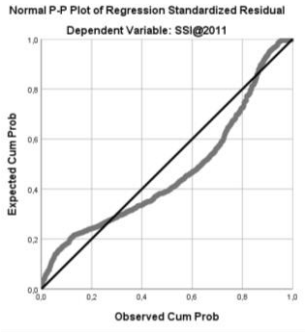


Figure 32: Normal P-Plot SSI 2006

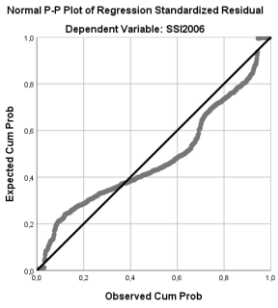


Figure 33: Normal P-Plot EW 2016

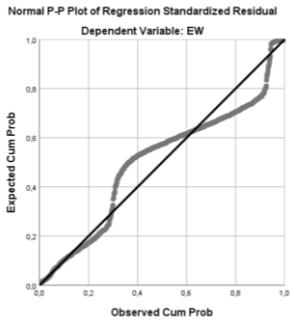


Figure 34: Normal P-Plot EW 2011

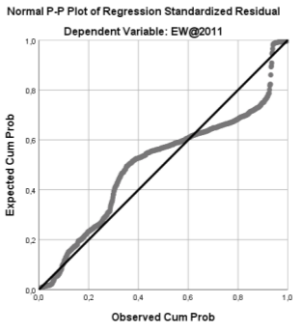


Figure 35: Normal P-Plot EW 2006

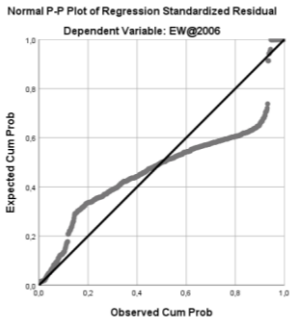


Figure 36: Normal P-Plot HW 2016

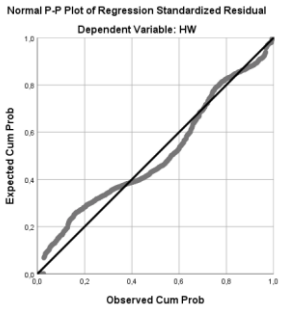


Figure 37: Normal P-Plot HW 2011

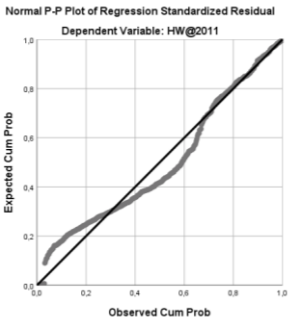


Figure 38: Normal P-Plot HW 2006

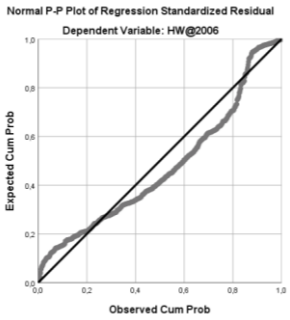


Figure 39: Normal P-Plot EC 2016

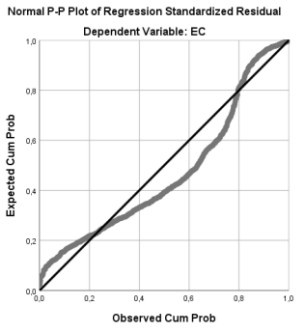


Figure 40: Normal P-Plot EC 2011

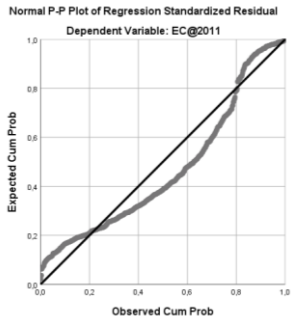
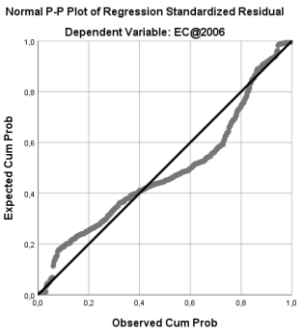


Figure 41: Normal P-Plot EC 2006



Assumption 5: Multicollinearity

In the case of multiple regression analysis the multicollinearity of the independent variables must also be checked. In the case of a multiple regression it is ideal that a number of independent variables highly correlate with the dependent variable, but with little correlation among themselves (Hair et al., 2014). So, there must be limited multicollinearity. This assumption is checked by looking at the tolerance values or the VIF values. The tolerance value should be high, which means a small degree of multicollinearity (i.e., the other independent variables do not collectively have any substantial amount of shared variance). A common cut-off threshold is a tolerance value of .10, which corresponds to a VIF value of 10. All tolerance values are higher than 0.10 and all VIF scores are higher than 10. So, the assumption of multicollinearity has been met.

Table 19: Sig. variables and Multicollinearity check SSI 2016

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	6,243	,031		198,709	,000					
	Region=EE	,116	,077	,046	1,518	,129	,095	,049	,045	,941	1,062
	Region=SE	-,532	,044	-,383	-12,027	,000	-,351	-,362	-,357	,869	1,151
	Region=WE	-,122	,034	-,114	-3,552	,000	,009	-,114	-,105	,859	1,165
	Industrynaam=Construction	-,186	,082	-,069	-2,256	,024	-,049	-,073	-,067	,928	1,078
	Industrynaam=Finance, Insurance and Real Estate	-,093	,039	-,081	-2,353	,019	-,006	-,076	-,070	,734	1,363
	Industrynaam=Mining	-,178	,068	-,083	-2,623	,009	-,006	-,084	-,078	,883	1,132
	Industrynaam=Retail Trade	-,222	,063	-,111	-3,512	,000	-,062	-,113	-,104	,873	1,145
	Industrynaam=Services	-,153	,053	-,093	-2,865	,004	-,020	-,092	-,085	,834	1,198
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,107	,048	-,074	-2,238	,025	-,050	-,072	-,066	,797	1,255
	Industrynaam=Wholesale Trade	-,229	,112	-,062	-2,046	,041	-,018	-,066	-,061	,960	1,042
2	(Constant)	6,063	,081		75,065	,000					
	Region=EE	,089	,077	,035	1,155	,248	,095	,038	,034	,904	1,106
	Region=SE	-,535	,046	-,385	-11,595	,000	-,351	-,353	-,337	,766	1,305
	Region=WE	-,123	,037	-,115	-3,338	,001	,009	-,108	-,097	,709	1,410
	Industrynaam=Construction	-,155	,082	-,058	-1,890	,059	-,049	-,061	-,055	,901	1,109
	Industrynaam=Finance, Insurance and Real Estate	-,032	,043	-,028	-,746	,456	-,006	-,024	-,022	,591	1,692
	Industrynaam=Mining	-,138	,070	-,064	-1,982	,048	-,006	-,064	-,058	,812	1,231
	Industrynaam=Retail Trade	-,170	,064	-,085	-2,667	,008	-,062	-,086	-,077	,823	1,215
	Industrynaam=Services	-,119	,054	-,072	-2,195	,028	-,020	-,071	-,064	,775	1,290
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,076	,048	-,052	-1,578	,115	-,050	-,051	-,046	,766	1,306
	Industrynaam=Wholesale Trade	-,245	,111	-,066	-2,207	,028	-,018	-,072	-,064	,936	1,068
	Resource_Use	,002	,001	,137	2,446	,015	-,059	,079	,071	,267	3,740
	Emmision_cent	-,002	,001	-,099	-1,858	,063	-,121	-,060	-,054	,295	3,395
	Emmision_2	-2,310E-5	,000	-,043	-1,182	,237	-,025	-,038	-,034	,635	1,574
	EI_Cent	,001	,001	,073	1,778	,076	-,008	,058	,052	,497	2,012
	EI_2	-2,210E-5	,000	-,042	-1,203	,229	-,051	-,039	-,035	,680	1,471
	Workforce_Cent	-,004	,001	-,233	-3,809	,000	-,120	-,123	-,111	,226	4,423
	Workforce_2	-9,660E-5	,000	-,208	-4,356	,000	-,022	-,140	-,127	,371	2,693
	HR_Cent	-3,769E-5	,001	-,003	-,065	,948	-,021	-,002	-,002	,481	2,081
	HR_2	2,527E-5	,000	,044	1,435	,152	,048	,047	,042	,881	1,135
	Community	,002	,001	,108	2,648	,008	-,007	,086	,077	,507	1,971
	Product_Responsibility	4,582E-5	,001	,003	,083	,934	-,084	,003	,002	,644	1,553
	Management	,000	,001	-,006	-,176	,860	-,012	-,006	-,005	,769	1,300
	Shareholders	,000	,001	-,009	-,315	,753	-,009	-,010	-,009	,957	1,045
	CSRS_Cent	-,002	,001	-,111	-2,377	,018	-,051	-,077	-,069	,390	2,562
	CSRS_2	5,026E-5	,000	,083	2,535	,011	,061	,082	,074	,790	1,265

a. Dependent Variable: SSI

Table 20:Sig. variables and Multicollinearity check SSI 2011

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	6,042	,034		177,037	,000					
	Region=EE	,077	,084	,032	,925	,355	,073	,033	,031	,926	1,079
	Region=SE	-,430	,047	-,335	-9,094	,000	-,306	-,311	-,306	,834	1,199
	Region=WE	-,081	,037	-,080	-2,173	,030	,045	-,078	-,073	,832	1,202
	Industrynaam=Construction	-,126	,084	-,053	-1,502	,133	-,028	-,054	-,051	,922	1,084
	Industrynaam=Finance, Insurance and Real Estate	-,063	,044	-,055	-1,423	,155	,005	-,051	-,048	,758	1,319
	Industrynaam=Mining	-,213	,071	-,107	-2,995	,003	-,033	-,107	-,101	,883	1,132
	Industrynaam=Retail Trade	-,211	,070	-,108	-3,025	,003	-,061	-,108	-,102	,883	1,132
	Industrynaam=Services	-,172	,059	-,106	-2,903	,004	-,039	-,104	-,098	,855	1,170
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,125	,052	-,092	-2,433	,015	-,063	-,087	-,082	,800	1,251
	Industrynaam=Wholesale Trade	-,273	,121	-,078	-2,264	,024	-,032	-,081	-,076	,960	1,041
2	(Constant)	6,204	,084		73,523	,000					
	Region=EE	,076	,085	,032	,893	,372	,073	,032	,030	,879	1,138
	Region=SE	-,426	,049	-,333	-8,615	,000	-,306	-,298	-,287	,743	1,346
	Region=WE	-,077	,039	-,076	-1,989	,047	,045	-,072	-,066	,755	1,324
	Industrynaam=Construction	-,122	,084	-,051	-1,445	,149	-,028	-,052	-,048	,898	1,113
	Industrynaam=Finance, Insurance and Real Estate	-,013	,047	-,011	-,273	,785	,005	-,010	-,009	,669	1,495
	Industrynaam=Mining	-,139	,074	-,070	-1,884	,060	-,033	-,068	-,063	,809	1,236
	Industrynaam=Retail Trade	-,206	,071	-,105	-2,907	,004	-,061	-,105	-,097	,843	1,186
	Industrynaam=Services	-,144	,060	-,089	-2,405	,016	-,039	-,087	-,080	,814	1,228
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,088	,052	-,064	-1,697	,090	-,063	-,061	-,057	,774	1,291
	Industrynaam=Wholesale Trade	-,271	,121	-,077	-2,239	,025	-,032	-,081	-,075	,935	1,070
	Resource_Use	-,001	,001	-,042	-,624	,533	-,020	-,023	-,021	,247	4,052
	Emmision_Cent	7,058E-6	,001	,000	,007	,995	-,015	,000	,000	,243	4,117
	Emmision_2	-3,287E-5	,000	-,064	-1,638	,102	-,073	-,059	-,055	,719	1,392
	Environmental_Innovation	,001	,001	,081	1,951	,051	,048	,071	,065	,645	1,550
	Workforce	-,002	,001	-,129	-2,282	,023	-,069	-,082	-,076	,345	2,900
	Human_Right	,003	,001	,190	3,911	,000	,080	,140	,130	,469	2,134
	Community	,000	,001	,026	,544	,587	,000	,020	,018	,483	2,071
	Product_Responsibility	,000	,001	-,017	-,382	,703	-,059	-,014	-,013	,564	1,774
	Management	-,001	,001	-,043	-1,110	,267	-,019	-,040	-,037	,750	1,333
	Shareholders	,000	,001	-,006	-,185	,853	-,012	-,007	-,006	,954	1,048
	CSR_Strategy	-,001	,001	-,065	-1,184	,237	-,001	-,043	-,039	,365	2,737

a. Dependent Variable: SSI@2011

Table 21: Sig. variables and Multicollinearity check SSI 2006

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	6,338	,029		216,529	,000					
	Region=SE	-,737	,043	-,591	-16,965	,000	-,458	-,580	-,552	,870	1,149
	Region=WE	-,430	,033	-,457	-13,183	,000	-,263	-,484	-,429	,878	1,139
	Industrynaam=Construction	-,121	,076	-,054	-1,604	,109	-,042	-,067	-,052	,929	1,076
	Industrynaam=Finance, Insurance and Real Estate	-,056	,040	-,052	-1,419	,157	-,046	-,059	-,046	,779	1,284
	Industrynaam=Mining	-,047	,071	-,022	-,661	,509	,066	-,028	-,021	,915	1,093
	Industrynaam=Retail Trade	-,105	,060	-,060	-1,735	,083	,009	-,073	-,056	,884	1,132
	Industrynaam=Services	-,084	,051	-,057	-1,627	,104	,028	-,068	-,053	,850	1,176
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,081	,047	-,063	-1,747	,081	-,102	-,073	-,057	,819	1,221
	Industrynaam=Wholesale Trade	-,163	,108	-,050	-1,505	,133	-,003	-,063	-,049	,965	1,036
2	(Constant)	6,372	,055		115,649	,000					
	Region=SE	-,744	,044	-,597	-16,954	,000	-,458	-,583	-,551	,851	1,175
	Region=WE	-,444	,034	-,472	-13,018	,000	-,263	-,482	-,423	,805	1,243
	Industrynaam=Construction	-,109	,076	-,048	-1,429	,154	-,042	-,060	-,046	,918	1,089
	Industrynaam=Finance, Insurance and Real Estate	-,043	,040	-,040	-1,059	,290	-,046	-,045	-,034	,748	1,336
	Industrynaam=Mining	-,037	,072	-,018	-,511	,610	,066	-,022	-,017	,882	1,133
	Industrynaam=Retail Trade	-,107	,061	-,061	-1,736	,083	,009	-,073	-,056	,849	1,178
	Industrynaam=Services	-,082	,053	-,056	-1,531	,126	,028	-,065	-,050	,789	1,268
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,071	,048	-,054	-1,477	,140	-,102	-,062	-,048	,778	1,285
	Industrynaam=Wholesale Trade	-,174	,109	-,053	-1,594	,111	-,003	-,067	-,052	,947	1,056
	Resource_Use	,000	,001	-,014	-,261	,794	-,033	-,011	-,008	,386	2,588
	Emmision	,000	,001	,036	,681	,496	-,034	,029	,022	,372	2,691
	Environmental_Innovation	,000	,001	,005	,134	,893	-,047	,006	,004	,775	1,290
	Workforce	-,001	,001	-,068	-1,522	,129	-,066	-,064	-,049	,532	1,880
	Human_Right	,000	,001	,024	,575	,566	-,012	,024	,019	,582	1,719
	Community	,000	,001	,028	,662	,508	,034	,028	,022	,604	1,657
	Product_Responsibility	,001	,001	,080	1,997	,046	-,055	,084	,065	,650	1,538
	Management	,000	,001	,017	,450	,653	,018	,019	,015	,773	1,294
	Shareholders	4,857E-6	,001	,000	,009	,993	-,001	,000	,000	,926	1,080
	CSR_Strategy	-,001	,001	-,086	-1,737	,083	-,070	-,073	-,056	,427	2,345

a. Dependent Variable: SSI2006

Table 22: Sig. variables and Multicollinearity check EW 2016

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4,289	,037		116,533	,000					
	Region=EE	-,135	,090	-,041	-1,500	,134	-,014	-,048	-,040	,941	1,062
	Region=SE	,521	,052	,289	10,063	,000	,402	,309	,269	,869	1,151
	Region=WE	-,527	,040	-,380	-13,147	,000	-,470	-,391	-,352	,859	1,165
	Industrynaam=Construction	-,038	,096	-,011	-,395	,693	-,010	-,013	-,011	,928	1,078
	Industrynaam=Finance, Insurance and Real Estate	,150	,046	,102	3,266	,001	,111	,105	,087	,734	1,363
	Industrynaam=Mining	,010	,080	,003	,120	,904	-,020	,004	,003	,883	1,132
	Industrynaam=Retail Trade	,165	,074	,064	2,231	,026	,066	,072	,060	,873	1,145
	Industrynaam=Services	,146	,062	,069	2,346	,019	,035	,076	,063	,834	1,198
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	,018	,056	,009	,313	,754	-,014	,010	,008	,797	1,255
	Industrynaam=Wholesale Trade	-,012	,131	-,003	-,094	,925	-,042	-,003	-,003	,960	1,042
2	(Constant)	4,340	,064		68,315	,000					
	Region=EE	-,112	,090	-,034	-1,241	,215	-,014	-,040	-,033	,923	1,084
	Region=SE	,544	,052	,302	10,401	,000	,402	,319	,276	,838	1,194
	Region=WE	-,498	,042	-,358	-11,970	,000	-,470	-,361	-,318	,785	1,274
	Industrynaam=Construction	,003	,096	,001	,030	,976	-,010	,001	,001	,919	1,088
	Industrynaam=Finance, Insurance and Real Estate	,156	,047	,106	3,300	,001	,111	,106	,088	,684	1,462
	Industrynaam=Mining	-,017	,080	-,006	-,211	,833	-,020	-,007	-,006	,854	1,170
	Industrynaam=Retail Trade	,145	,074	,056	1,963	,050	,066	,063	,052	,865	1,156
	Industrynaam=Services	,134	,063	,063	2,115	,035	,035	,068	,056	,799	1,252
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	,016	,056	,009	,292	,771	-,014	,009	,008	,791	1,265
	Industrynaam=Wholesale Trade	-,024	,131	-,005	-,182	,856	-,042	-,006	-,005	,951	1,051
	Resource_Use	,000	,001	-,012	-,273	,785	-,100	-,009	-,007	,365	2,743
	Emmision_cent	-,004	,002	-,204	-2,639	,008	-,066	-,085	-,070	,118	8,458
	Emmision_2	2,820E-5	,000	,041	1,075	,283	-,038	,035	,029	,496	2,017
	Emmision_3	2,790E-6	,000	,273	3,465	,001	-,011	,111	,092	,113	8,816
	Environmental_Innovation	-,001	,001	-,073	-2,305	,021	-,133	-,074	-,061	,707	1,415
3	(Constant)	4,321	,083		51,962	,000					
	Region=EE	-,137	,090	-,042	-1,511	,131	-,014	-,049	-,040	,911	1,097
	Region=SE	,522	,053	,289	9,804	,000	,402	,303	,260	,808	1,238
	Region=WE	-,513	,042	-,369	-12,200	,000	-,470	-,368	-,323	,767	1,303
	Industrynaam=Construction	-,002	,097	-,001	-,026	,980	-,010	-,001	-,001	,904	1,107
	Industrynaam=Finance, Insurance and Real Estate	,135	,050	,091	2,707	,007	,111	,087	,072	,616	1,623
	Industrynaam=Mining	-,023	,082	-,008	-,286	,775	-,020	-,009	-,008	,827	1,209
	Industrynaam=Retail Trade	,140	,075	,054	1,858	,064	,066	,060	,049	,833	1,200
	Industrynaam=Services	,128	,064	,060	1,996	,046	,035	,065	,053	,774	1,292
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	,001	,057	,000	,016	,987	-,014	,001	,000	,772	1,296
	Industrynaam=Wholesale Trade	-,035	,131	-,007	-,268	,789	-,042	-,009	-,007	,943	1,060
	Resource_Use	,000	,001	,018	,355	,723	-,100	,012	,009	,278	3,593
	Emmision_cent	-,004	,002	-,207	-2,645	,008	-,066	-,085	-,070	,115	8,690
	Emmision_2	3,461E-5	,000	,050	1,310	,191	-,038	,042	,035	,487	2,054
	Emmision_3	2,820E-6	,000	,276	3,489	,001	-,011	,112	,092	,112	8,908
	Environmental_Innovation	-,001	,001	-,074	-2,294	,022	-,133	-,074	-,061	,683	1,465
	Workforce	,000	,001	,015	,359	,720	-,047	,012	,009	,420	2,383
	Human_Right	-,002	,001	-,091	-2,421	,016	-,124	-,078	-,064	,501	1,995
	Community	5,824E-5	,001	,003	,082	,935	-,072	,003	,002	,529	1,890
	Product_Responsibility	,001	,001	,039	1,180	,238	-,020	,038	,031	,650	1,538
4	(Constant)	4,277	,088		48,572	,000					
	Region=EE	-,132	,090	-,041	-1,465	,143	-,014	-,048	-,039	,907	1,102
	Region=SE	,550	,054	,304	10,090	,000	,402	,311	,267	,769	1,300
	Region=WE	-,486	,043	-,350	-11,192	,000	-,470	-,342	-,296	,716	1,397
	Industrynaam=Construction	-,005	,097	-,001	-,051	,960	-,010	-,002	-,001	,901	1,110
	Industrynaam=Finance, Insurance and Real Estate	,130	,050	,088	2,605	,009	,111	,084	,069	,613	1,632
	Industrynaam=Mining	-,044	,082	-,016	-,540	,589	-,020	-,018	-,014	,817	1,224
	Industrynaam=Retail Trade	,141	,075	,054	1,875	,061	,066	,061	,050	,830	1,205
	Industrynaam=Services	,136	,064	,064	2,126	,034	,035	,069	,056	,770	1,298
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,007	,057	-,004	-,130	,896	-,014	-,004	-,003	,767	1,304
	Industrynaam=Wholesale Trade	-,032	,131	-,007	-,242	,809	-,042	-,008	-,006	,941	1,062
	Resource_Use	,000	,001	-,006	-,124	,902	-,100	-,004	-,003	,267	3,742
	Emmision_cent	-,005	,002	-,221	-2,794	,005	-,066	-,090	-,074	,112	8,905
	Emmision_2	3,535E-5	,000	,051	1,338	,181	-,038	,043	,035	,486	2,059
	Emmision_3	2,792E-6	,000	,273	3,437	,001	-,011	,111	,091	,111	9,021
	Environmental_Innovation	-,002	,001	-,083	-2,574	,010	-,133	-,083	-,068	,671	1,491
	Workforce	-6,002E-5	,001	-,002	-,058	,954	-,047	-,002	-,002	,405	2,470
	Human_Right	-,002	,001	-,099	-2,632	,009	-,124	-,085	-,070	,497	2,013
	Community	,000	,001	-,011	-,304	,761	-,072	-,010	-,008	,510	1,960
	Product_Responsibility	,001	,001	,036	1,085	,278	-,020	,035	,029	,648	1,542
	Management	,000	,001	,008	,278	,781	,009	,009	,007	,768	1,302
	Shareholders	,000	,001	,020	,757	,449	,019	,025	,020	,963	1,038
	CSR_Strategy	,002	,001	,089	2,147	,032	-,013	,070	,057	,411	2,436

a. Dependent Variable: EW

Table 23: Sig. variables and Multicollinearity check EW 2011

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3,608	,036		101,009	,000					
	Region=EE	,074	,088	,028	,849	,396	,022	,031	,027	,926	1,079
	Region=SE	,452	,049	,322	9,152	,000	,385	,313	,294	,834	1,199
	Region=WE	-,227	,039	-,204	-5,789	,000	-,319	-,204	-,186	,832	1,202
	Industrynaam=Construction	-,034	,088	-,013	-,385	,700	-,002	-,014	-,012	,922	1,084
	Industrynaam=Finance, Insurance and Real Estate	,067	,046	,053	1,442	,150	,085	,052	,046	,758	1,319
	Industrynaam=Mining	-,092	,074	-,042	-1,240	,215	-,071	-,045	-,040	,883	1,132
	Industrynaam=Retail Trade	,155	,073	,072	2,118	,034	,079	,076	,068	,883	1,132
	Industrynaam=Services	,098	,062	,055	1,577	,115	,031	,057	,051	,855	1,170
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,049	,054	-,032	-,901	,368	-,024	-,032	-,029	,800	1,251
	Industrynaam=Wholesale Trade	,038	,126	,010	,301	,764	-,015	,011	,010	,960	1,041
2	(Constant)	3,593	,049		73,912	,000					
	Region=EE	,080	,089	,030	,896	,371	,022	,032	,029	,898	1,113
	Region=SE	,459	,050	,326	9,244	,000	,385	,316	,297	,828	1,208
	Region=WE	-,220	,040	-,197	-5,537	,000	-,319	-,196	-,178	,811	1,233
	Industrynaam=Construction	-,025	,088	-,010	-,287	,774	-,002	-,010	-,009	,920	1,087
	Industrynaam=Finance, Insurance and Real Estate	,065	,046	,052	1,397	,163	,085	,050	,045	,753	1,328
	Industrynaam=Mining	-,114	,076	-,052	-1,511	,131	-,071	-,054	-,048	,854	1,171
	Industrynaam=Retail Trade	,153	,073	,071	2,088	,037	,079	,075	,067	,882	1,134
	Industrynaam=Services	,094	,062	,053	1,509	,132	,031	,054	,048	,840	1,190
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,062	,054	-,041	-1,133	,258	-,024	-,041	-,036	,786	1,272
	Industrynaam=Wholesale Trade	,028	,127	,007	,218	,827	-,015	,008	,007	,952	1,051
	Resource_Use	,000	,001	-,009	-,159	,874	-,021	-,006	-,005	,313	3,196
	Emmision	,001	,001	,059	1,040	,299	-,010	,037	,033	,318	3,142
	Environmental_Innovation	-,001	,001	-,064	-1,662	,097	-,057	-,060	-,053	,693	1,444
3	(Constant)	3,570	,059		60,758	,000					
	Region=EE	,078	,090	,030	,869	,385	,022	,031	,028	,884	1,131
	Region=SE	,458	,050	,326	9,094	,000	,385	,312	,292	,802	1,247
	Region=WE	-,222	,040	-,199	-5,539	,000	-,319	-,196	-,178	,795	1,258
	Industrynaam=Construction	-,040	,088	-,015	-,453	,651	-,002	-,016	-,015	,912	1,096
	Industrynaam=Finance, Insurance and Real Estate	,042	,049	,034	,864	,388	,085	,031	,028	,681	1,468
	Industrynaam=Mining	-,134	,077	-,062	-1,739	,082	-,071	-,063	-,056	,821	1,218
	Industrynaam=Retail Trade	,155	,074	,073	2,095	,037	,079	,076	,067	,857	1,167
	Industrynaam=Services	,082	,063	,046	1,295	,196	,031	,047	,042	,824	1,213
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,068	,055	-,045	-1,253	,211	-,024	-,045	-,040	,781	1,280
	Industrynaam=Wholesale Trade	,021	,127	,005	,166	,868	-,015	,006	,005	,941	1,063
	Resource_Use	1,321E-6	,001	,000	,001	,999	-,021	,000	,000	,253	3,949
	Emmision	,001	,001	,070	1,168	,243	-,010	,042	,037	,283	3,536
	Environmental_Innovation	-,001	,001	-,053	-1,349	,178	-,057	-,049	-,043	,659	1,517
	Workforce	,001	,001	,027	,498	,619	-,025	,018	,016	,353	2,832
	Human_Right	-,001	,001	-,101	-2,213	,027	-,073	-,080	-,071	,496	2,014
	Community	,000	,001	,030	,672	,502	-,004	,024	,022	,521	1,918
	Product_Responsibility	-5,609E-5	,001	-,004	-,085	,932	,028	-,003	-,003	,568	1,762
4	(Constant)	3,560	,067		53,412	,000					
	Region=EE	,070	,090	,027	,776	,438	,022	,028	,025	,880	1,137
	Region=SE	,468	,051	,332	9,166	,000	,385	,315	,294	,783	1,278
	Region=WE	-,215	,041	-,192	-5,293	,000	-,319	-,188	-,170	,778	1,285
	Industrynaam=Construction	-,035	,089	-,013	-,393	,695	-,002	-,014	-,013	,898	1,113
	Industrynaam=Finance, Insurance and Real Estate	,043	,049	,035	,888	,375	,085	,032	,028	,677	1,478
	Industrynaam=Mining	-,142	,078	-,065	-1,826	,068	-,071	-,066	-,059	,811	1,232
	Industrynaam=Retail Trade	,165	,075	,077	2,209	,027	,079	,080	,071	,843	1,186
	Industrynaam=Services	,090	,063	,050	1,415	,157	,031	,051	,045	,814	1,228
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,073	,055	-,048	-1,328	,185	-,024	-,048	-,043	,775	1,290
	Industrynaam=Wholesale Trade	,032	,128	,008	,251	,802	-,015	,009	,008	,935	1,069
	Resource_Use	,000	,001	-,009	-,145	,885	-,021	-,005	-,005	,248	4,031
	Emmision	,001	,001	,052	,824	,410	-,010	,030	,026	,263	3,796
	Environmental_Innovation	-,001	,001	-,060	-1,506	,133	-,057	-,054	-,048	,646	1,548
	Workforce	,000	,001	,019	,344	,731	-,025	,012	,011	,347	2,878
	Human_Right	-,002	,001	-,106	-2,312	,021	-,073	-,083	-,074	,492	2,030
	Community	,000	,001	,015	,326	,745	-,004	,012	,010	,483	2,069
	Product_Responsibility	-6,772E-5	,001	-,004	-,103	,918	,028	-,004	-,003	,567	1,765
	Management	,000	,001	,023	,627	,531	,011	,023	,020	,751	1,331
	Shareholders	-2,984E-5	,001	-,002	-,049	,961	-,010	-,002	-,002	,955	1,048
	CSR_Strategy	,001	,001	,054	1,024	,306	-,024	,037	,033	,366	2,732

a. Dependent Variable: EW@2011

Table 24: Sig. variables and Multicollinearity check EW 2006

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3,109	,032		95,993	,000					
	Region=SE	,164	,048	,151	3,415	,001	,163	,142	,141	,870	1,149
	Region=WE	-,038	,036	-,046	-1,041	,298	-,096	-,044	-,043	,878	1,139
	Industrynaam=Construction	-,099	,084	-,050	-1,181	,238	-,047	-,049	-,049	,929	1,076
	Industrynaam=Finance, Insurance and Real Estate	,025	,044	,026	,561	,575	,046	,023	,023	,779	1,284
	Industrynaam=Mining	-,014	,078	-,008	-,175	,861	-,018	-,007	-,007	,915	1,093
	Industrynaam=Retail Trade	,055	,067	,036	,820	,413	,041	,034	,034	,884	1,132
	Industrynaam=Services	,021	,057	,017	,374	,708	,015	,016	,015	,850	1,176
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,033	,052	-,029	-,638	,524	-,017	-,027	-,026	,819	1,221
	Industrynaam=Wholesale Trade	-,049	,120	-,017	-,406	,685	-,027	-,017	-,017	,965	1,036
2	(Constant)	3,108	,038		81,875	,000					
	Region=SE	,164	,048	,150	3,395	,001	,163	,141	,140	,869	1,150
	Region=WE	-,036	,037	-,043	-,961	,337	-,096	-,040	-,040	,840	1,191
	Industrynaam=Construction	-,098	,084	-,050	-1,165	,244	-,047	-,049	-,048	,925	1,081
	Industrynaam=Finance, Insurance and Real Estate	,027	,045	,029	,611	,541	,046	,026	,025	,761	1,314
	Industrynaam=Mining	-,019	,079	-,010	-,241	,810	-,018	-,010	-,010	,899	1,112
	Industrynaam=Retail Trade	,059	,068	,039	,875	,382	,041	,037	,036	,864	1,157
	Industrynaam=Services	,020	,058	,016	,342	,732	,015	,014	,014	,819	1,222
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,037	,052	-,032	-,704	,481	-,017	-,030	-,029	,803	1,245
	Industrynaam=Wholesale Trade	-,050	,121	-,017	-,411	,681	-,027	-,017	-,017	,957	1,045
	Resource_Use	,000	,001	-,025	-,409	,683	-,016	-,017	-,017	,472	2,120
	Emmision	,000	,001	,033	,548	,584	-,010	,023	,023	,460	2,176
	Environmental_Innovation	,000	,001	-,021	-,454	,650	-,036	-,019	-,019	,825	1,212
3	(Constant)	3,132	,051		61,061	,000					
	Region=SE	,164	,049	,151	3,379	,001	,163	,141	,139	,852	1,173
	Region=WE	-,034	,038	-,041	-,891	,373	-,096	-,038	-,037	,810	1,235
	Industrynaam=Construction	-,097	,084	-,049	-1,146	,252	-,047	-,048	-,047	,920	1,087
	Industrynaam=Finance, Insurance and Real Estate	,030	,045	,032	,675	,500	,046	,028	,028	,750	1,334
	Industrynaam=Mining	-,010	,080	-,005	-,124	,902	-,018	-,005	-,005	,886	1,128
	Industrynaam=Retail Trade	,068	,068	,045	1,002	,317	,041	,042	,041	,853	1,172
	Industrynaam=Services	,026	,059	,020	,437	,662	,015	,018	,018	,799	1,251
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,039	,052	-,035	-,754	,451	-,017	-,032	-,031	,800	1,251
	Industrynaam=Wholesale Trade	-,042	,121	-,015	-,352	,725	-,027	-,015	-,015	,955	1,047
	Resource_Use	,000	,001	-,012	-,181	,856	-,016	-,008	-,007	,396	2,525
	Emmision	,000	,001	,042	,646	,519	-,010	,027	,027	,399	2,506
	Environmental_Innovation	,000	,001	-,024	-,520	,603	-,036	-,022	-,021	,786	1,272
	Workforce	-,001	,001	-,074	-1,319	,188	-,042	-,056	-,054	,541	1,848
	Human_Right	-,001	,001	-,050	-,936	,350	-,031	-,039	-,039	,601	1,665
	Community	,001	,001	,078	1,528	,127	,036	,064	,063	,652	1,534
	Product_Responsibility	,000	,001	,038	,743	,458	,020	,031	,031	,660	1,516
4	(Constant)	3,169	,061		51,844	,000					
	Region=SE	,164	,049	,151	3,377	,001	,163	,141	,139	,851	1,175
	Region=WE	-,036	,038	-,044	-,964	,336	-,096	-,041	-,040	,805	1,243
	Industrynaam=Construction	-,101	,084	-,051	-1,192	,234	-,047	-,050	-,049	,918	1,089
	Industrynaam=Finance, Insurance and Real Estate	,032	,045	,034	,707	,480	,046	,030	,029	,748	1,336
	Industrynaam=Mining	-,005	,080	-,003	-,065	,948	-,018	-,003	-,003	,882	1,133
	Industrynaam=Retail Trade	,069	,068	,046	1,017	,310	,041	,043	,042	,849	1,178
	Industrynaam=Services	,019	,059	,015	,325	,745	,015	,014	,013	,789	1,268
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,035	,053	-,031	-,655	,513	-,017	-,028	-,027	,778	1,285
	Industrynaam=Wholesale Trade	-,053	,121	-,018	-,436	,663	-,027	-,018	-,018	,947	1,056
	Resource_Use	-3,612E-5	,001	-,003	-,048	,962	-,016	-,002	-,002	,386	2,588
	Emmision	,001	,001	,047	,693	,489	-,010	,029	,029	,372	2,691
	Environmental_Innovation	,000	,001	-,023	-,491	,624	-,036	-,021	-,020	,775	1,290
	Workforce	-,001	,001	-,068	-1,209	,227	-,042	-,051	-,050	,532	1,880
	Human_Right	-,001	,001	-,042	-,778	,437	-,031	-,033	-,032	,582	1,719
	Community	,001	,001	,095	1,783	,075	,036	,075	,074	,604	1,657
	Product_Responsibility	,001	,001	,045	,885	,377	,020	,037	,037	,650	1,538
	Management	-,001	,001	-,053	-1,121	,263	-,036	-,047	-,046	,773	1,294
	Shareholders	,000	,001	-,024	-,567	,571	-,025	-,024	-,023	,926	1,080
	CSR_Strategy	,000	,001	-,017	-,272	,785	-,011	-,012	-,011	,427	2,345

a. Dependent Variable: EW@2006

Table 25: Sig. variables and Multicollinearity check HW 2016

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	8,600	,014		623,808	,000					
	Region=EE	-,157	,034	-,080	-4,679	,000	-,012	-,149	-,078	,941	1,062
	Region=SE	-,918	,019	-,845	-47,281	,000	-,848	-,836	-,787	,869	1,151
	Region=WE	,039	,015	,047	2,620	,009	,311	,084	,044	,859	1,165
	Industrynaam=Construction	-,015	,036	-,007	-,414	,679	-,033	-,013	-,007	,928	1,078
	Industrynaam=Finance, Insurance and Real Estate	-,049	,017	-,055	-2,835	,005	-,076	-,091	-,047	,734	1,363
	Industrynaam=Mining	-,061	,030	-,036	-2,042	,041	,041	-,066	-,034	,883	1,132
	Industrynaam=Retail Trade	-,048	,028	-,031	-1,714	,087	-,006	-,055	-,029	,873	1,145
	Industrynaam=Services	-,045	,023	-,035	-1,934	,053	,035	-,062	-,032	,834	1,198
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,001	,021	-,001	-,057	,955	-,064	-,002	-,001	,797	1,255
	Industrynaam=Wholesale Trade	-,010	,049	-,004	-,206	,837	,054	-,007	-,003	,960	1,042
2	(Constant)	8,584	,023		375,934	,000					
	Region=EE	-,146	,034	-,075	-4,318	,000	-,012	-,138	-,072	,925	1,082
	Region=SE	-,918	,020	-,845	-46,140	,000	-,848	-,831	-,767	,823	1,215
	Region=WE	,038	,015	,046	2,485	,013	,311	,080	,041	,817	1,224
	Industrynaam=Construction	-,009	,036	-,004	-,235	,814	-,033	-,008	-,004	,920	1,087
	Industrynaam=Finance, Insurance and Real Estate	-,031	,018	-,035	-1,710	,088	-,076	-,055	-,028	,644	1,554
	Industrynaam=Mining	-,051	,030	-,030	-1,687	,092	,041	-,054	-,028	,852	1,173
	Industrynaam=Retail Trade	-,040	,028	-,026	-1,407	,160	-,006	-,045	-,023	,837	1,195
	Industrynaam=Services	-,035	,024	-,027	-1,485	,138	,035	-,048	-,025	,809	1,236
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	,007	,021	,006	,338	,735	-,064	,011	,006	,781	1,280
	Industrynaam=Wholesale Trade	,003	,049	,001	,067	,946	,054	,002	,001	,950	1,053
	Workforce	,000	,000	-,027	-1,269	,205	-,044	-,041	-,021	,588	1,700
	Human_Right	,001	,000	,050	2,286	,022	,069	,074	,038	,573	1,747
	Community	,000	,000	,016	,726	,468	-,034	,023	,012	,586	1,707
	Product_Responsibility	5,921E-5	,000	,005	,245	,806	-,083	,008	,004	,674	1,484
3	(Constant)	8,590	,026		336,432	,000					
	Region=EE	-,149	,034	-,076	-4,389	,000	-,012	-,141	-,073	,921	1,086
	Region=SE	-,929	,020	-,855	-45,924	,000	-,848	-,830	-,761	,792	1,262
	Region=WE	,029	,016	,035	1,873	,061	,311	,061	,031	,783	1,277
	Industrynaam=Construction	-,005	,036	-,002	-,130	,897	-,033	-,004	-,002	,916	1,092
	Industrynaam=Finance, Insurance and Real Estate	-,029	,018	-,032	-1,553	,121	-,076	-,050	-,026	,639	1,565
	Industrynaam=Mining	-,043	,030	-,025	-1,411	,159	,041	-,046	-,023	,844	1,185
	Industrynaam=Retail Trade	-,041	,028	-,026	-1,442	,150	-,006	-,047	-,024	,834	1,199
	Industrynaam=Services	-,042	,024	-,033	-1,785	,075	,035	-,058	-,030	,798	1,254
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	,013	,021	,011	,590	,555	-,064	,019	,010	,773	1,294
	Industrynaam=Wholesale Trade	-,002	,049	-,001	-,040	,968	,054	-,001	-,001	,946	1,057
	Workforce	-3,433E-5	,000	-,002	-,097	,922	-,044	-,003	-,002	,499	2,003
	Human_Right	,001	,000	,063	2,801	,005	,069	,090	,046	,548	1,824
	Community	,000	,000	,032	1,440	,150	-,034	,047	,024	,542	1,845
	Product_Responsibility	,000	,000	,011	,533	,594	-,083	,017	,009	,666	1,501
	Management	,000	,000	-,010	-,553	,580	,004	-,018	-,009	,779	1,284
	Shareholders	,000	,000	-,009	-,543	,587	-,002	-,018	-,009	,967	1,035
	CSR_Strategy	-,001	,000	-,060	-2,505	,012	,016	-,081	-,042	,480	2,084
4	(Constant)	8,593	,026		335,938	,000					
	Region=EE	-,151	,034	-,077	-4,475	,000	-,012	-,144	-,074	,919	1,088
	Region=SE	-,935	,020	-,861	-45,952	,000	-,848	-,830	-,759	,778	1,285
	Region=WE	,020	,016	,023	1,220	,223	,311	,040	,020	,738	1,356
	Industrynaam=Construction	-,015	,036	-,007	-,404	,686	-,033	-,013	-,007	,906	1,103
	Industrynaam=Finance, Insurance and Real Estate	-,027	,018	-,031	-1,493	,136	-,076	-,048	-,025	,635	1,576
	Industrynaam=Mining	-,029	,031	-,017	-,958	,338	,041	-,031	-,016	,820	1,220
	Industrynaam=Retail Trade	-,036	,028	-,023	-1,290	,197	-,006	-,042	-,021	,831	1,204
	Industrynaam=Services	-,032	,024	-,025	-1,324	,186	,035	-,043	-,022	,778	1,286
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	,013	,021	,011	,606	,545	-,064	,020	,010	,768	1,302
	Industrynaam=Wholesale Trade	,005	,049	,002	,109	,913	,054	,004	,002	,943	1,061
	Workforce	,000	,000	-,013	-,495	,621	-,044	-,016	-,008	,412	2,425
	Human_Right	,001	,000	,053	2,265	,024	,069	,073	,037	,503	1,988
	Community	,000	,000	,020	,868	,385	-,034	,028	,014	,519	1,928
	Product_Responsibility	4,907E-5	,000	,004	,201	,841	-,083	,007	,003	,649	1,542
	Management	,000	,000	-,011	-,604	,546	,004	-,020	-,010	,778	1,286
	Shareholders	,000	,000	-,009	-,563	,573	-,002	-,018	-,009	,964	1,037
	CSR_Strategy	-,001	,000	-,079	-3,083	,002	,016	-,100	-,051	,411	2,433
	Resource_Use	,000	,000	,036	1,121	,263	-,018	,036	,019	,269	3,724
	Emmision	-8,149E-5	,000	-,006	-,222	,824	-,035	-,007	-,004	,333	3,007
	Environmental_Innovation	,001	,000	,051	2,550	,011	,010	,082	,042	,671	1,491

a. Dependent Variable: HW

Table 26: Sig. variables and Multicollinearity check HW 2011

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	8,343	,019		435,704	,000					
	Region=EE	-,108	,047	-,058	-2,300	,022	-,027	-,083	-,056	,926	1,079
	Region=SE	-,644	,027	-,644	-24,309	,000	-,702	-,658	-,588	,834	1,199
	Region=WE	,159	,021	,200	7,549	,000	,430	,262	,183	,832	1,202
	Industrynaam=Construction	-,032	,047	-,017	-,681	,496	-,033	-,024	-,016	,922	1,084
	Industrynaam=Finance, Insurance and Real Estate	-,053	,025	-,059	-2,121	,034	-,097	-,076	-,051	,758	1,319
	Industrynaam=Mining	-,072	,040	-,046	-1,797	,073	,018	-,065	-,043	,883	1,132
	Industrynaam=Retail Trade	-,086	,039	-,056	-2,187	,029	-,045	-,078	-,053	,883	1,132
	Industrynaam=Services	-,067	,033	-,053	-2,006	,045	,006	-,072	-,049	,855	1,170
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,012	,029	-,011	-,398	,691	-,041	-,014	-,010	,800	1,251
	Industrynaam=Wholesale Trade	-,044	,068	-,016	-,647	,518	,035	-,023	-,016	,960	1,041
2	(Constant)	8,408	,039		214,840	,000					
	Region=EE	-,076	,047	-,041	-1,605	,109	-,027	-,058	-,038	,887	1,128
	Region=SE	-,646	,026	-,646	-24,469	,000	-,702	-,662	-,581	,811	1,233
	Region=WE	,157	,021	,198	7,509	,000	,430	,262	,178	,811	1,234
	Industrynaam=Construction	-,021	,046	-,011	-,449	,654	-,033	-,016	-,011	,916	1,092
	Industrynaam=Finance, Insurance and Real Estate	-,021	,026	-,024	-,826	,409	-,097	-,030	-,020	,684	1,463
	Industrynaam=Mining	-,047	,040	-,031	-1,182	,238	,018	-,043	-,028	,844	1,185
	Industrynaam=Retail Trade	-,087	,039	-,057	-2,216	,027	-,045	-,080	-,053	,857	1,167
	Industrynaam=Services	-,043	,033	-,034	-1,288	,198	,006	-,046	-,031	,832	1,203
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,010	,029	-,009	-,350	,726	-,041	-,013	-,008	,792	1,263
	Industrynaam=Wholesale Trade	-,028	,067	-,010	-,415	,678	,035	-,015	-,010	,943	1,060
	Workforce	,000	,001	-,017	-,493	,622	,093	-,018	-,012	,494	2,026
	HR_Cent	,002	,000	,207	5,166	,000	,134	,183	,123	,352	2,838
	HR_2	-3,783E-5	,000	-,104	-3,296	,001	,021	-,118	-,078	,572	1,749
	Community	-,001	,000	-,043	-1,332	,183	,024	-,048	-,032	,549	1,820
	Product_Responsibility	,000	,000	,021	,688	,492	-,012	,025	,016	,592	1,691
3	(Constant)	8,430	,042		199,548	,000					
	Region=EE	-,065	,047	-,035	-1,396	,163	-,027	-,050	-,033	,884	1,131
	Region=SE	-,665	,026	-,666	-25,142	,000	-,702	-,673	-,591	,788	1,269
	Region=WE	,145	,021	,183	6,933	,000	,430	,243	,163	,796	1,256
	Industrynaam=Construction	-,021	,046	-,011	-,457	,648	-,033	-,017	-,011	,903	1,108
	Industrynaam=Finance, Insurance and Real Estate	-,021	,025	-,023	-,817	,414	-,097	-,030	-,019	,681	1,469
	Industrynaam=Mining	-,038	,040	-,024	-,949	,343	,018	-,034	-,022	,837	1,194
	Industrynaam=Retail Trade	-,106	,039	-,069	-2,716	,007	-,045	-,098	-,064	,845	1,183
	Industrynaam=Services	-,061	,033	-,048	-1,863	,063	,006	-,067	-,044	,816	1,226
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,001	,028	-,001	-,042	,966	-,041	-,002	-,001	,786	1,272
	Industrynaam=Wholesale Trade	-,051	,067	-,019	-,773	,439	,035	-,028	-,018	,937	1,068
	Workforce	,001	,001	,040	1,128	,260	,093	,041	,027	,429	2,330
	HR_Cent	,003	,000	,243	5,989	,000	,134	,212	,141	,337	2,970
	HR_2	-4,085E-5	,000	-,112	-3,573	,000	,021	-,128	-,084	,564	1,774
	Community	-1,955E-6	,000	,000	-,005	,996	,024	,000	,000	,494	2,023
	Product_Responsibility	,000	,000	,035	1,129	,259	-,012	,041	,027	,585	1,709
	Management	,000	,000	-,030	-1,109	,268	-,003	-,040	-,026	,749	1,336
	Shareholders	-3,176E-5	,000	-,002	-,101	,920	,006	-,004	-,002	,955	1,047
	CSR_Strategy	-,002	,000	-,146	-4,105	,000	,047	-,147	-,096	,436	2,291
4	(Constant)	8,426	,042		200,500	,000					
	Region=EE	-,059	,047	-,032	-1,273	,203	-,027	-,046	-,030	,877	1,140
	Region=SE	-,671	,026	-,671	-25,455	,000	-,702	-,678	-,593	,782	1,279
	Region=WE	,134	,021	,169	6,383	,000	,430	,225	,149	,776	1,289
	Industrynaam=Construction	-,034	,046	-,018	-,742	,458	-,033	-,027	-,017	,898	1,114
	Industrynaam=Finance, Insurance and Real Estate	-,028	,025	-,031	-1,107	,268	-,097	-,040	-,026	,674	1,483
	Industrynaam=Mining	-,012	,040	-,007	-,289	,773	,018	-,010	-,007	,811	1,232
	Industrynaam=Retail Trade	-,111	,039	-,073	-2,865	,004	-,045	-,103	-,067	,843	1,187
	Industrynaam=Services	-,054	,033	-,043	-1,658	,098	,006	-,060	-,039	,813	1,230
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	,007	,028	,007	,264	,792	-,041	,010	,006	,775	1,290
	Industrynaam=Wholesale Trade	-,044	,066	-,016	-,672	,502	,035	-,024	-,016	,934	1,071
	Workforce	2,974E-5	,001	,002	,050	,960	,093	,002	,001	,347	2,885
	HR_Cent	,002	,000	,210	5,086	,000	,134	,181	,119	,318	3,144
	HR_2	-3,818E-5	,000	-,105	-3,353	,001	,021	-,121	-,078	,559	1,790
	Community	,000	,000	-,010	-,284	,776	,024	-,010	-,007	,483	2,070
	Product_Responsibility	,000	,000	,017	,553	,580	-,012	,020	,013	,566	1,766
	Management	,000	,000	-,036	-1,345	,179	-,003	-,049	-,031	,746	1,340
	Shareholders	-4,349E-5	,000	-,003	-,139	,889	,006	-,005	-,003	,951	1,052
	CSR_Strategy	-,002	,000	-,191	-4,958	,000	,047	-,177	-,116	,365	2,738
	Resource_Use	,000	,001	,030	,650	,516	,099	,024	,015	,248	4,039
	Emmision	,001	,001	,048	1,051	,293	,095	,038	,025	,263	3,805
	Environmental_Innovation	,001	,000	,100	3,440	,001	,119	,124	,080	,646	1,549

a. Dependent Variable: HW@2011

Table 27: Sig. variables and Multicollinearity check HW 2006

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	8,412	,021		397,363	,000					
	Region=SE	-,505	,031	-,574	-16,084	,000	-,582	-,559	-,536	,870	1,149
	Region=WE	-,003	,024	-,005	-,141	,888	,200	-,006	-,005	,878	1,139
	Industrynaam=Construction	-,109	,055	-,069	-1,989	,047	-,048	-,083	-,066	,929	1,076
	Industrynaam=Finance, Insurance and Real Estate	-,077	,029	-,101	-2,685	,007	-,072	-,112	-,089	,779	1,284
	Industrynaam=Mining	-,077	,051	-,052	-1,506	,133	,033	-,063	-,050	,915	1,093
	Industrynaam=Retail Trade	-,177	,044	-,144	-4,054	,000	-,096	-,168	-,135	,884	1,132
	Industrynaam=Services	-,131	,037	-,128	-3,539	,000	-,052	-,147	-,118	,850	1,176
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,073	,034	-,080	-2,169	,031	-,082	-,091	-,072	,819	1,221
	Industrynaam=Wholesale Trade	-,126	,078	-,054	-1,603	,109	,007	-,067	-,053	,965	1,036
2	(Constant)	8,413	,041		206,250	,000					
	Region=SE	-,513	,031	-,583	-16,352	,000	-,582	-,567	-,539	,854	1,171
	Region=WE	-,014	,024	-,021	-,569	,570	,200	-,024	-,019	,825	1,212
	Industrynaam=Construction	-,101	,054	-,064	-1,860	,063	-,048	-,078	-,061	,921	1,086
	Industrynaam=Finance, Insurance and Real Estate	-,072	,029	-,095	-2,509	,012	-,072	-,105	-,083	,754	1,327
	Industrynaam=Mining	-,072	,051	-,049	-1,418	,157	,033	-,060	-,047	,908	1,101
	Industrynaam=Retail Trade	-,185	,044	-,150	-4,257	,000	-,096	-,177	-,140	,869	1,151
	Industrynaam=Services	-,126	,037	-,123	-3,408	,001	-,052	-,142	-,112	,839	1,192
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,071	,033	-,078	-2,136	,033	-,082	-,090	-,070	,814	1,228
	Industrynaam=Wholesale Trade	-,146	,078	-,063	-1,880	,061	,007	-,079	-,062	,958	1,043
	Workforce	,000	,000	-,024	-,600	,549	-,041	-,025	-,020	,688	1,454
	HR_Cent	,001	,001	,120	1,460	,145	,021	,061	,048	,161	6,215
	HR_2	-1,980E-5	,000	-,091	-1,168	,243	,010	-,049	-,038	,180	5,553
	Community_Cent	-,002	,000	-,172	-3,927	,000	-,073	-,163	-,129	,567	1,764
	Community_2	2,365E-5	,000	,070	1,827	,068	,065	,077	,060	,744	1,344
	Product_Responsibility	,001	,000	,060	1,516	,130	-,014	,064	,050	,682	1,466
3	(Constant)	8,384	,048		175,505	,000					
	Region=SE	-,511	,031	-,581	-16,394	,000	-,582	-,569	-,537	,854	1,171
	Region=WE	-,013	,024	-,020	-,542	,588	,200	-,023	-,018	,824	1,214
	Industrynaam=Construction	-,099	,054	-,062	-1,826	,068	-,048	-,077	-,060	,919	1,088
	Industrynaam=Finance, Insurance and Real Estate	-,072	,029	-,095	-2,503	,013	-,072	-,105	-,082	,753	1,328
	Industrynaam=Mining	-,073	,051	-,050	-1,449	,148	,033	-,061	-,047	,907	1,103
	Industrynaam=Retail Trade	-,192	,043	-,156	-4,436	,000	-,096	-,184	-,145	,864	1,157
	Industrynaam=Services	-,136	,037	-,132	-3,639	,000	-,052	-,152	-,119	,812	1,231
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,061	,034	-,066	-1,806	,071	-,082	-,076	-,059	,792	1,263
	Industrynaam=Wholesale Trade	-,159	,078	-,069	-2,040	,042	,007	-,086	-,067	,946	1,057
	Workforce	-1,069E-5	,000	-,001	-,022	,982	-,041	-,001	-,001	,625	1,601
	HR_Cent	,002	,001	,162	1,907	,057	,021	,080	,062	,149	6,714
	HR_2	-2,456E-5	,000	-,113	-1,441	,150	,010	-,061	-,047	,176	5,680
	Community_Cent	-,002	,000	-,161	-3,535	,000	-,073	-,148	-,116	,515	1,942
	Community_2	2,325E-5	,000	,069	1,805	,072	,065	,076	,059	,743	1,347
	Product_Responsibility	,001	,000	,066	1,635	,103	-,014	,069	,054	,660	1,515
	Management	,001	,000	,067	1,794	,073	,028	,076	,059	,775	1,290
	Shareholders	,000	,000	,015	,451	,652	,007	,019	,015	,929	1,077
	CSR_Strategy	-,001	,000	-,118	-2,533	,012	-,089	-,106	-,083	,491	2,037
4	(Constant)	8,379	,048		174,886	,000					
	Region=SE	-,511	,031	-,581	-16,382	,000	-,582	-,570	-,536	,850	1,176
	Region=WE	-,022	,024	-,033	-,894	,372	,200	-,038	-,029	,797	1,254
	Industrynaam=Construction	-,096	,054	-,060	-1,767	,078	-,048	-,075	-,058	,917	1,091
	Industrynaam=Finance, Insurance and Real Estate	-,071	,029	-,093	-2,455	,014	-,072	-,103	-,080	,741	1,350
	Industrynaam=Mining	-,062	,051	-,042	-1,204	,229	,033	-,051	-,039	,878	1,139
	Industrynaam=Retail Trade	-,190	,044	-,154	-4,337	,000	-,096	-,181	-,142	,845	1,184
	Industrynaam=Services	-,131	,038	-,128	-3,469	,001	-,052	-,145	-,113	,788	1,269
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,051	,034	-,056	-1,509	,132	-,082	-,064	-,049	,778	1,286
	Industrynaam=Wholesale Trade	-,157	,078	-,068	-2,015	,044	,007	-,085	-,066	,945	1,059
	Workforce	,000	,001	,009	,192	,848	-,041	,008	,006	,529	1,892
	HR_Cent	,002	,001	,161	1,882	,060	,021	,079	,062	,147	6,807
	HR_2	-2,610E-5	,000	-,120	-1,533	,126	,010	-,065	-,050	,176	5,692
	Community_Cent	-,002	,000	-,164	-3,589	,000	-,073	-,150	-,117	,510	1,962
	Community_2	2,359E-5	,000	,070	1,833	,067	,065	,077	,060	,741	1,349
	Product_Responsibility	,001	,000	,061	1,502	,134	-,014	,064	,049	,645	1,551
	Management	,001	,000	,068	1,832	,068	,028	,077	,060	,771	1,297
	Shareholders	,000	,000	,016	,466	,642	,007	,020	,015	,926	1,080
	CSR_Strategy	-,001	,000	-,124	-2,458	,014	-,089	-,104	-,080	,419	2,386
	Resource_Use	,000	,000	-,021	-,405	,686	-,028	-,017	-,013	,386	2,592
	Emmision	,000	,000	-,012	-,222	,824	-,012	-,009	-,007	,371	2,692
	Environmental_Innovation	,001	,001	,082	2,216	,027	,101	,094	,072	,774	1,293

a. Dependent Variable: HW@2006

Table 28: Sig. variables and Multicollinearity check EC 2016

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	5,842	,086		67,777	,000					
	Region=EE	,641	,210	,093	3,049	,002	,115	,098	,091	,941	1,062
	Region=SE	-1,200	,121	-,315	-9,888	,000	-,332	-,304	-,294	,869	1,151
	Region=WE	,123	,094	,042	1,310	,191	,144	,042	,039	,859	1,165
	Industrynaam=Construction	-,504	,226	-,069	-2,232	,026	-,040	-,072	-,066	,928	1,078
	Industrynaam=Finance, Insurance and Real Estate	-,379	,108	-,122	-3,514	,000	-,038	-,113	-,104	,734	1,363
	Industrynaam=Mining	-,484	,187	-,082	-2,594	,010	-,009	-,083	-,077	,883	1,132
	Industrynaam=Retail Trade	-,785	,174	-,144	-4,519	,000	-,097	-,144	-,134	,873	1,145
	Industrynaam=Services	-,559	,146	-,124	-3,826	,000	-,048	-,123	-,114	,834	1,198
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,339	,132	-,086	-2,572	,010	-,030	-,083	-,076	,797	1,255
	Industrynaam=Wholesale Trade	-,664	,307	-,066	-2,164	,031	-,015	-,070	-,064	,960	1,042
2	(Constant)	5,780	,143		40,333	,000					
	Region=EE	,562	,211	,082	2,662	,008	,115	,086	,079	,926	1,079
	Region=SE	-1,210	,121	-,318	-9,997	,000	-,332	-,308	-,296	,868	1,152
	Region=WE	,111	,094	,038	1,183	,237	,144	,038	,035	,857	1,167
	Industrynaam=Construction	-,492	,225	-,067	-2,184	,029	-,040	-,070	-,065	,925	1,081
	Industrynaam=Finance, Insurance and Real Estate	-,450	,110	-,145	-4,094	,000	-,038	-,131	-,121	,702	1,424
	Industrynaam=Mining	-,482	,186	-,082	-2,586	,010	-,009	-,083	-,077	,880	1,137
	Industrynaam=Retail Trade	-,798	,173	-,146	-4,600	,000	-,097	-,147	-,136	,869	1,151
	Industrynaam=Services	-,601	,147	-,134	-4,094	,000	-,048	-,131	-,121	,821	1,217
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,330	,131	-,083	-2,508	,012	-,030	-,081	-,074	,795	1,257
	Industrynaam=Wholesale Trade	-,735	,307	-,073	-2,395	,017	-,015	-,077	-,071	,953	1,049
	Management	,000	,002	,008	,240	,810	-,018	,008	,007	,807	1,239
	Shareholders	-,001	,001	-,011	-,360	,719	-,018	-,012	-,011	,965	1,037
	CSRS_Cent	-,004	,001	-,080	-2,389	,017	-,054	-,077	-,071	,783	1,278
	CSRS_2	,000	,000	,064	2,124	,034	,069	,069	,063	,954	1,048
3	(Constant)	5,563	,180		30,904	,000					
	Region=EE	,584	,209	,085	2,796	,005	,115	,090	,081	,915	1,093
	Region=SE	-1,188	,125	-,312	-9,504	,000	-,332	-,295	-,276	,784	1,275
	Region=WE	,159	,097	,054	1,629	,104	,144	,053	,047	,764	1,310
	Industrynaam=Construction	-,380	,223	-,052	-1,704	,089	-,040	-,055	-,050	,910	1,099
	Industrynaam=Finance, Insurance and Real Estate	-,218	,117	-,070	-1,861	,063	-,038	-,060	-,054	,597	1,675
	Industrynaam=Mining	-,442	,187	-,075	-2,362	,018	-,009	-,076	-,069	,842	1,187
	Industrynaam=Retail Trade	-,660	,174	-,121	-3,792	,000	-,097	-,122	-,110	,830	1,204
	Industrynaam=Services	-,528	,146	-,118	-3,611	,000	-,048	-,116	-,105	,796	1,256
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,238	,131	-,060	-1,819	,069	-,030	-,059	-,053	,771	1,298
	Industrynaam=Wholesale Trade	-,755	,303	-,075	-2,489	,013	-,015	-,080	-,072	,941	1,063
	Management	-,001	,002	-,012	-,366	,715	-,018	-,012	-,011	,774	1,292
	Shareholders	-,001	,001	-,016	-,552	,581	-,018	-,018	-,016	,960	1,041
	CSRS_Cent	-,004	,002	-,102	-2,376	,018	-,054	-,077	-,069	,458	2,184
	CSRS_2	,000	,000	,078	2,480	,013	,069	,080	,072	,843	1,186
	Workforce_Cent	-,013	,003	-,249	-4,500	,000	-,097	-,144	-,131	,275	3,637
	Workforce_2	,000	,000	-,240	-5,346	,000	-,030	-,171	-,155	,420	2,380
	HR_Cent	,002	,002	,057	1,414	,158	,016	,046	,041	,525	1,905
	HR_2	5,442E-5	,000	,035	1,134	,257	,055	,037	,033	,890	1,123
	Community	,006	,002	,142	3,567	,000	,035	,115	,104	,533	1,876
	Product_Responsibility	,000	,001	-,007	-,190	,849	-,059	-,006	-,006	,661	1,513
4	(Constant)	5,468	,220		24,850	,000					
	Region=EE	,534	,208	,078	2,572	,010	,115	,083	,074	,902	1,108
	Region=SE	-1,223	,125	-,321	-9,788	,000	-,332	-,304	-,281	,766	1,306
	Region=WE	,097	,100	,033	,973	,331	,144	,032	,028	,709	1,410
	Industrynaam=Construction	-,477	,222	-,065	-2,150	,032	-,040	-,070	-,062	,897	1,115
	Industrynaam=Finance, Insurance and Real Estate	-,210	,116	-,068	-1,803	,072	-,038	-,059	-,052	,588	1,701
	Industrynaam=Mining	-,342	,188	-,058	-1,817	,070	-,009	-,059	-,052	,812	1,231
	Industrynaam=Retail Trade	-,616	,173	-,113	-3,565	,000	-,097	-,115	-,102	,823	1,215
	Industrynaam=Services	-,485	,147	-,108	-3,296	,001	-,048	-,107	-,095	,768	1,302
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,241	,130	-,061	-1,856	,064	-,030	-,060	-,053	,765	1,307
	Industrynaam=Wholesale Trade	-,724	,301	-,072	-2,408	,016	-,015	-,078	-,069	,935	1,069
	Management	1,962E-5	,002	,000	,013	,990	-,018	,000	,000	,761	1,315
	Shareholders	-,001	,001	-,017	-,582	,561	-,018	-,019	-,017	,956	1,046
	CSRS_Cent	-,006	,002	-,140	-3,048	,002	-,054	-,099	-,088	,390	2,562
	CSRS_2	,000	,000	,080	2,458	,014	,069	,080	,071	,787	1,270
	Workforce_Cent	-,013	,003	-,249	-4,119	,000	-,097	-,133	-,118	,226	4,425
	Workforce_2	,000	,000	-,229	-4,847	,000	-,030	-,156	-,139	,371	2,696
	HR_Cent	,001	,002	,034	,825	,410	,016	,027	,024	,480	2,084
	HR_2	6,217E-5	,000	,040	1,304	,193	,055	,042	,037	,881	1,136
	Community	,005	,002	,114	2,814	,005	,035	,091	,081	,505	1,979
	Product_Responsibility	-,001	,001	-,015	-,425	,671	-,059	-,014	-,012	,644	1,553
	Resource_Use	,006	,002	,135	2,417	,016	-,013	,078	,069	,266	3,759
	Emmision_cent	,006	,004	,129	1,480	,139	-,092	,048	,042	,109	9,204
	Emmision_2	,000	,000	-,114	-2,601	,009	-,001	-,084	-,075	,433	2,311
	Emmision_3	-6,321E-6	,000	-,293	-3,387	,001	-,105	-,110	-,097	,110	9,084
	EI_Cent	,004	,002	,107	2,617	,009	,052	,085	,075	,497	2,014
	EI_2	-7,155E-5	,000	-,050	-1,437	,151	-,035	-,047	-,041	,679	1,473

a. Dependent Variable: EC

Table 29: Sig. variables and Multicollinearity check EC 2011

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	6,133	,090		67,875	,000					
	Region=EE	,281	,222	,044	1,267	,206	,083	,046	,042	,926	1,079
	Region=SE	-1,150	,125	-,337	-9,195	,000	-,317	-,314	-,308	,834	1,199
	Region=WE	-,154	,099	-,057	-1,552	,121	,069	-,056	-,052	,832	1,202
	Industrynaam=Construction	-,347	,222	-,054	-1,562	,119	-,027	-,056	-,052	,922	1,084
	Industrynaam=Finance, Insurance and Real Estate	-,204	,117	-,067	-1,740	,082	-,002	-,062	-,058	,758	1,319
	Industrynaam=Mining	-,473	,188	-,089	-2,513	,012	-,011	-,090	-,084	,883	1,132
	Industrynaam=Retail Trade	-,712	,185	-,137	-3,852	,000	-,089	-,137	-,129	,883	1,132
	Industrynaam=Services	-,556	,157	-,128	-3,547	,000	-,060	-,127	-,119	,855	1,170
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,319	,136	-,087	-2,335	,020	-,050	-,084	-,078	,800	1,251
	Industrynaam=Wholesale Trade	-,805	,319	-,086	-2,523	,012	-,038	-,090	-,084	,960	1,041
2	(Constant)	6,271	,144		43,485	,000					
	Region=EE	,259	,223	,041	1,164	,245	,083	,042	,039	,920	1,088
	Region=SE	-1,162	,125	-,340	-9,259	,000	-,317	-,317	-,310	,830	1,205
	Region=WE	-,159	,099	-,059	-1,603	,109	,069	-,058	-,054	,831	1,204
	Industrynaam=Construction	-,370	,224	-,058	-1,649	,100	-,027	-,059	-,055	,907	1,102
	Industrynaam=Finance, Insurance and Real Estate	-,221	,118	-,072	-1,870	,062	-,002	-,067	-,063	,747	1,339
	Industrynaam=Mining	-,469	,189	-,089	-2,482	,013	-,011	-,089	-,083	,879	1,137
	Industrynaam=Retail Trade	-,737	,186	-,142	-3,960	,000	-,089	-,141	-,132	,874	1,144
	Industrynaam=Services	-,591	,159	-,136	-3,722	,000	-,060	-,133	-,125	,834	1,199
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,308	,137	-,084	-2,246	,025	-,050	-,081	-,075	,795	1,258
	Industrynaam=Wholesale Trade	-,847	,321	-,091	-2,638	,009	-,038	-,095	-,088	,950	1,053
	Management	-,001	,002	-,030	-,806	,421	-,026	-,029	-,027	,802	1,246
	Shareholders	7,032E-5	,002	,002	,046	,963	-,011	,002	,002	,962	1,040
	CSR_Strategy	-,001	,002	-,033	-,870	,384	-,006	-,031	-,029	,786	1,272
3	(Constant)	6,519	,166		39,344	,000					
	Region=EE	,240	,223	,038	1,077	,282	,083	,039	,035	,887	1,127
	Region=SE	-1,161	,127	-,340	-9,163	,000	-,317	-,314	-,302	,789	1,268
	Region=WE	-,128	,100	-,047	-1,280	,201	,069	-,046	-,042	,798	1,253
	Industrynaam=Construction	-,308	,221	-,048	-1,390	,165	-,027	-,050	-,046	,903	1,107
	Industrynaam=Finance, Insurance and Real Estate	-,072	,122	-,024	-,593	,553	-,002	-,021	-,020	,683	1,465
	Industrynaam=Mining	-,341	,191	-,064	-1,787	,074	-,011	-,064	-,059	,837	1,194
	Industrynaam=Retail Trade	-,685	,186	-,132	-3,680	,000	-,089	-,132	-,121	,845	1,183
	Industrynaam=Services	-,493	,158	-,114	-3,122	,002	-,060	-,112	-,103	,817	1,224
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,242	,136	-,066	-1,785	,075	-,050	-,064	-,059	,786	1,272
	Industrynaam=Wholesale Trade	-,843	,318	-,090	-2,648	,008	-,038	-,095	-,087	,938	1,066
	Management	-,002	,002	-,043	-1,125	,261	-,026	-,041	-,037	,753	1,327
	Shareholders	-8,179E-5	,002	-,002	-,054	,957	-,011	-,002	-,002	,959	1,043
	CSR_Strategy	-,002	,002	-,046	-,935	,350	-,006	-,034	-,031	,440	2,272
	Workforce	-,008	,003	-,151	-3,023	,003	-,094	-,109	-,100	,433	2,307
	Human_Right	,008	,002	,211	4,612	,000	,081	,164	,152	,520	1,923
	Community	,001	,002	,020	,430	,667	-,010	,016	,014	,495	2,022
	Product_Responsibility	-,001	,002	-,022	-,508	,611	-,076	-,018	-,017	,585	1,709
4	(Constant)	6,608	,222		29,799	,000					
	Region=EE	,244	,224	,038	1,090	,276	,083	,039	,036	,879	1,138
	Region=SE	-1,121	,130	-,328	-8,616	,000	-,317	-,298	-,283	,743	1,346
	Region=WE	-,124	,102	-,046	-1,209	,227	,069	-,044	-,040	,755	1,324
	Industrynaam=Construction	-,333	,221	-,052	-1,507	,132	-,027	-,055	-,049	,898	1,113
	Industrynaam=Finance, Insurance and Real Estate	-,046	,122	-,015	-,379	,705	-,002	-,014	-,012	,669	1,495
	Industrynaam=Mining	-,251	,193	-,047	-1,299	,194	-,011	-,047	-,043	,809	1,236
	Industrynaam=Retail Trade	-,684	,186	-,132	-3,684	,000	-,089	-,132	-,121	,843	1,186
	Industrynaam=Services	-,476	,158	-,110	-3,022	,003	-,060	-,109	-,099	,814	1,228
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,198	,136	-,054	-1,456	,146	-,050	-,053	-,048	,774	1,291
	Industrynaam=Wholesale Trade	-,796	,318	-,085	-2,505	,012	-,038	-,090	-,082	,935	1,070
	Management	-,002	,002	-,044	-1,153	,249	-,026	-,042	-,038	,750	1,333
	Shareholders	,000	,002	-,007	-,205	,838	-,011	-,007	-,007	,954	1,048
	CSR_Strategy	-,002	,002	-,045	-,829	,407	-,006	-,030	-,027	,365	2,737
	Workforce	-,008	,003	-,152	-2,725	,007	-,094	-,098	-,089	,345	2,900
	Human_Right	,008	,002	,227	4,725	,000	,081	,169	,155	,469	2,134
	Community	,001	,002	,018	,386	,699	-,010	,014	,013	,483	2,071
	Product_Responsibility	-,001	,002	-,018	-,417	,677	-,076	-,015	-,014	,564	1,774
	Resource_Use	-,002	,003	-,053	-,808	,419	-,044	-,029	-,027	,247	4,052
	Emmision_Cent	-,002	,003	-,050	-,751	,453	-,043	-,027	-,025	,243	4,117
	Emmision_2	,000	,000	-,085	-2,190	,029	-,067	-,079	-,072	,719	1,392
	Environmental_Innovation	,003	,002	,091	2,225	,026	,044	,080	,073	,645	1,550

a. Dependent Variable: EC@2011

Table 30: Sig. variables and Multicollinearity check EC 2006

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	7,527	,065		116,554	,000					
	Region=SE	-1,852	,096	-,622	-19,328	,000	-,456	-,630	-,580	,870	1,149
	Region=WE	-1,256	,072	-,559	-17,436	,000	-,358	-,590	-,524	,878	1,139
	Industrynaam=Construction	-,150	,167	-,028	-,901	,368	-,018	-,038	-,027	,929	1,076
	Industrynaam=Finance, Insurance and Real Estate	-,122	,088	-,047	-1,391	,165	-,053	-,058	-,042	,779	1,284
	Industrynaam=Mining	-,097	,156	-,019	-,620	,536	,070	-,026	-,019	,915	1,093
	Industrynaam=Retail Trade	-,203	,133	-,049	-1,524	,128	,023	-,064	-,046	,884	1,132
	Industrynaam=Services	-,146	,113	-,042	-1,291	,197	,045	-,054	-,039	,850	1,176
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,146	,103	-,047	-1,422	,155	-,099	-,060	-,043	,819	1,221
	Industrynaam=Wholesale Trade	-,311	,239	-,040	-1,298	,195	,005	-,054	-,039	,965	1,036
2	(Constant)	7,460	,101		73,827	,000					
	Region=SE	-1,850	,096	-,622	-19,286	,000	-,456	-,630	-,580	,870	1,150
	Region=WE	-1,252	,072	-,557	-17,360	,000	-,358	-,589	-,522	,876	1,141
	Industrynaam=Construction	-,145	,167	-,027	-,866	,387	-,018	-,036	-,026	,927	1,079
	Industrynaam=Finance, Insurance and Real Estate	-,124	,088	-,048	-1,411	,159	-,053	-,059	-,042	,777	1,287
	Industrynaam=Mining	-,100	,157	-,020	-,640	,523	,070	-,027	-,019	,913	1,095
	Industrynaam=Retail Trade	-,211	,134	-,051	-1,577	,115	,023	-,066	-,047	,878	1,139
	Industrynaam=Services	-,150	,115	-,043	-1,304	,193	,045	-,055	-,039	,825	1,212
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,139	,104	-,045	-1,338	,182	-,099	-,056	-,040	,802	1,247
	Industrynaam=Wholesale Trade	-,314	,241	-,040	-1,300	,194	,005	-,055	-,039	,951	1,052
	Management	,001	,001	,039	1,189	,235	,029	,050	,036	,847	1,181
	Shareholders	,000	,001	,012	,372	,710	,007	,016	,011	,942	1,061
	CSR_Strategy	-,001	,001	-,032	-,971	,332	-,058	-,041	-,029	,828	1,208
3	(Constant)	7,555	,121		62,657	,000					
	Region=SE	-1,868	,096	-,628	-19,369	,000	-,456	-,633	-,581	,855	1,170
	Region=WE	-1,281	,074	-,570	-17,345	,000	-,358	-,590	-,520	,832	1,202
	Industrynaam=Construction	-,122	,167	-,023	-,732	,465	-,018	-,031	-,022	,921	1,086
	Industrynaam=Finance, Insurance and Real Estate	-,096	,088	-,037	-1,085	,278	-,053	-,046	-,033	,761	1,314
	Industrynaam=Mining	-,085	,156	-,017	-,542	,588	,070	-,023	-,016	,911	1,097
	Industrynaam=Retail Trade	-,219	,134	-,053	-1,639	,102	,023	-,069	-,049	,869	1,151
	Industrynaam=Services	-,139	,116	-,040	-1,198	,231	,045	-,050	-,036	,813	1,230
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,128	,104	-,041	-1,226	,221	-,099	-,052	-,037	,792	1,263
	Industrynaam=Wholesale Trade	-,319	,241	-,041	-1,325	,186	,005	-,056	-,040	,948	1,054
	Management	,001	,001	,025	,728	,467	,029	,031	,022	,777	1,287
	Shareholders	,000	,001	,006	,200	,841	,007	,008	,006	,929	1,077
	CSR_Strategy	-,002	,001	-,059	-1,391	,165	-,058	-,059	-,042	,502	1,991
	Workforce	-,002	,001	-,055	-1,454	,147	-,056	-,061	-,044	,631	1,585
	Human_Right	,001	,001	,034	,886	,376	-,010	,037	,027	,609	1,641
	Community	,001	,001	,026	,682	,496	,043	,029	,020	,609	1,642
	Product_Responsibility	,002	,001	,070	1,895	,059	-,073	,080	,057	,666	1,502
4	(Constant)	7,554	,122		62,103	,000					
	Region=SE	-1,868	,097	-,628	-19,275	,000	-,456	-,632	-,579	,851	1,175
	Region=WE	-1,281	,075	-,570	-17,019	,000	-,358	-,584	-,511	,805	1,243
	Industrynaam=Construction	-,119	,168	-,022	-,710	,478	-,018	-,030	-,021	,918	1,089
	Industrynaam=Finance, Insurance and Real Estate	-,090	,089	-,035	-1,008	,314	-,053	-,043	-,030	,748	1,336
	Industrynaam=Mining	-,085	,159	-,017	-,533	,595	,070	-,023	-,016	,882	1,133
	Industrynaam=Retail Trade	-,209	,136	-,050	-1,538	,125	,023	-,065	-,046	,849	1,178
	Industrynaam=Services	-,133	,118	-,038	-1,133	,258	,045	-,048	-,034	,789	1,268
	Industrynaam=Transportation, Communications, Electric, Gas and Sanitary service	-,133	,105	-,043	-1,259	,209	-,099	-,053	-,038	,778	1,285
	Industrynaam=Wholesale Trade	-,318	,242	-,041	-1,315	,189	,005	-,056	-,040	,947	1,056
	Management	,001	,001	,024	,705	,481	,029	,030	,021	,773	1,294
	Shareholders	,000	,001	,007	,227	,820	,007	,010	,007	,926	1,080
	CSR_Strategy	-,002	,001	-,066	-1,428	,154	-,058	-,060	-,043	,427	2,345
	Workforce	-,002	,002	-,060	-1,449	,148	-,056	-,061	-,044	,532	1,880
	Human_Right	,001	,001	,031	,795	,427	-,010	,034	,024	,582	1,719
	Community	,001	,001	,025	,646	,518	,043	,027	,019	,604	1,657
	Product_Responsibility	,002	,001	,069	1,856	,064	-,073	,078	,056	,650	1,538
	Resource_Use	,000	,001	-,008	-,168	,867	-,027	-,007	-,005	,386	2,588
	Emmision	,001	,001	,030	,614	,539	-,037	,026	,018	,372	2,691
	Environmental_Innovation	,000	,002	-,007	-,214	,831	-,075	-,009	-,006	,775	1,290

a. Dependent Variable: EC@2006

Appendix 3: Extensive results of the multiple regression analyses

Figure 42: Multiple regression analysis SSI 2006, 2011 & 2016

	SSI 2006			SSI 2011			SSI 2016	
	Model 1	Model 2		Model 1	Model 2		Model 1	Model 2
Constant	6,338	6,372		6,042	6,204		6,243	6,063
Control variables								
Region								
Dummy EE	N/A	N/A		0,077	0,076		0,116	0,089
Dummy SE	-0,737***	-0,744		-0,43***	-0,426***		-0,532***	-0,535***
Dummy WE	-0,43***	-0,444***		-0,081*	-0,077*		-0,122***	-0,123**
Industry								
Dummy MI	-0,047	-0,037		-0,213**	-0,139		-0,178**	-0,138*
Dummy CON	-0,121	-0,109		-0,126	-0,122		-0,178***	-0,155
Dummy TRANS	-0,081	-0,071		-0,125*	-0,088		-0,178*	-0,076
Dummy WTRADE	-0,163	-0,174		-0,273*	-0,271*		-0,178*	-0,245**
Dummy RTRADE	-0,105	-0,107		-0,211**	-0,206**		-0,178***	-0,17**
Dummy FIRE	-0,056	-0,043		-0,063	-0,013		-0,178***	-0,032
Dummy SERV	-0,084	-0,082		-0,172**	-0,144*		-0,178**	-0,119*
Predictor variables								
Envrionmental Pillar								
Resource Use		0,000			-0,001			0,002**
Emission		0,000			7,06E-06			-0,002
Environmental Innovation		0,000			0,001			0,001
Social Pillar								
Workforce		-0,001			-0,002*			-9,660E-5***[2]
Human Right		0,000			0,003***			-3,80E-05
Community		0,000			0,000			0,002**
Product Responsibility		0,001*			0,000			4,58E-05
Governance Pillar								
Management		0,000			-0,001			0,000
Shareholders		4,88E-06			0,000			0,000
CSR Strategy		-0,001			-0,001			5,026E-5*[2]
R2	0,40	0,41		0,125	0,156		0,156	0,202
R2 adjusted	0,39	0,39		0,114	0,133		0,147	0,181
ΔR2 adjusted		0,00			0,019			0,034
ΔF	41,90***	1,05		11,04***	2,56**		17,68***	3,69***
F-ratio	41,90***	20,42***		11,04***	6,72***		17,68***	9,59***
F-ratio test of overall model significance; R2 is the coefficient of determination								
*p < 0,05, **p < 0,01, ***p < 0,001.								
NE en MAN reference categorie								
[2] polynoom tweede term	[3] polynoom derde term							
[3] polynoom derde term								

Figure 43: Multiple regression analysis EW, HW & EC 2016

	Environmental Wellbeing				Human Wellbeing				Economic Wellbeing			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	4,289	4,34	4,321	4,277	8,6	8,584	8,59	8,593	5,842	5,78	5,563	5,468
Control variables												
Region												
Dummy EE	-0,135	-0,112	-0,137	-0,132	-0,157***	-0,146***	-0,149***	-0,151***	0,641**	0,562**	0,584**	0,534**
Dummy SE	0,521***	0,544***	0,522***	0,55***	-0,918***	-0,918***	-0,929***	-0,935***	-1,2***	-1,21***	-1,188***	-1,223***
Dummy WE	-0,527***	-0,498***	-0,513***	-0,486***	0,039**	0,038*	0,029	0,02	0,123	0,111	0,159	0,097
Industry												
Dummy MI	0,01	-0,017	-0,023	-0,044	-0,061*	-0,051	-0,043	-0,029	-0,484**	-0,482**	-0,442*	-0,342
Dummy CON	-0,038	0,003	-0,002	-0,005	-0,015	-0,009	-0,005	-0,015	-0,504*	-0,492*	-0,38	-0,477*
Dummy TRANS	0,018	0,016	0,001	-0,007	-0,001	0,007	0,013	0,013	-0,339**	-0,33*	-0,238	-0,241
Dummy WTRADE	-0,012	-0,024	-0,035	-0,032	-0,01	0,003	-0,002	0,005	-0,664*	-0,735*	-0,755*	-0,724*
Dummy RTRADE	0,165*	0,145*	0,14	0,141	-0,048	-0,04	-0,041	-0,036	-0,785***	-0,798***	-0,66***	-0,616***
Dummy FIRE	0,15**	0,156**	0,135**	0,13**	-0,049**	-0,031	-0,029	-0,027	-0,379***	-0,45***	-0,218	-0,21
Dummy SERV	0,146*	0,134*	0,128*	0,136*	-0,045	-0,035	-0,042	-0,032	-0,559***	-0,601***	-0,528***	-0,485**
Predictor variables												
Envrionmental Pillar												
Resource Use		0,00	0,00	0,00				0,000				0,006*
Emission		2,79E-06**[3]	2,82E-6**[3]	2,79E-06**[3]				-8,15E-05				-6,32E-06**
Environmental Innovation		-0,001*	-0,001**	-0,002*				0,001*				0,004
Social Pillar												
Workforce			0	-6,00E-05		0,000	-3,43E-05	0,000			0,000***[2]	0,000***[2]
Human Right			-0,002*	-0,002**		0,001*	0,001**	0,001*			0,002	0,001
Community			5,82E-05	0,000		0,000	0,00	0,000			0,006***	0,005**
Product Responsibility			0,001	0,001		5,92E-05	0,00	4,91E-05			0	-0,001
Governance Pillar												
Management				0,000			0,00	0,000		0,000	-0,001	1,96E-05
Shareholders				0,000			0,00	0,000		-0,001	-0,001	-0,001
CSR Strategy				0,002*			-0,001*	-0,001**		0,000*[2]	0,000*[2]	0,000*[2]
R2	0,313	0,328	0,332	0,336	0,734	0,736	0,738	0,741	0,153	0,162	0,198	0,222
R2 adjusted	0,306	0,317	0,319	0,321	0,731	0,732	0,734	0,735	0,144	0,15	0,181	0,2
ΔR2 adjusted		0,011	0,002	0,002		0,001	0,002	0,001		0,006	0,031	0,019
ΔF	43,69***	4,18**	1,74	1,93	264,66***	2,09	2,63*	2,91*	17,35***	2,64*	7,01***	4,83***
F-ratio	43,69***	31,01***	24,92***	21,85***	264,66***	190,49***	158,14***	135,66***	17,35***	13,24***	11,72***	10,35***

F-ratio test of overall model significance; R2 is the coefficient of determination

*p < 0,05, **p < 0,01, ***p < 0,001.

NE en MAN reference categorie

[2] polynoom tweede term [3] polynoom derde term

Figure 44: Multiple regression analysis EW, HW & EC 2011

	Environmental Wellbeing				Human Wellbeing				Economic Wellbeing			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	3,608	3,593	3,57	3,56	8,343	8,408	8,43	8,426	6,133	6,271	6,519	6,608
Control variables												
Region												
Dummy EE	0,074	0,08	0,078	0,07	-0,108*	-0,076	-0,065	-0,059	0,281	0,259	0,24	0,244
Dummy SE	0,452***	0,459***	0,458***	0,468***	-0,644***	-0,646***	-0,665***	-0,671***	-1,15***	-1,162***	-1,161***	-1,121***
Dummy WE	-0,227***	-0,22***	-0,222***	-0,215***	0,159***	0,157***	0,145***	0,134***	-0,154	-0,159	-0,128	-0,124
Industry												
Dummy MI	-0,092	-0,114	-0,134	-0,142	-0,072	-0,047	-0,038	-0,012	-0,473*	-0,469*	-0,341	-0,251
Dummy CON	-0,034	-0,025	-0,04	-0,035	-0,032	-0,021	-0,021	-0,034	-0,347	-0,37	-0,308	-0,333
Dummy TRANS	-0,049	-0,062	-0,068	-0,073	-0,012	-0,01	-0,001	0,007	-0,319*	-0,308*	-0,242	-0,198
Dummy WTRADE	0,038	0,028	0,021	0,032	-0,044	-0,028	-0,051	-0,044	-0,805*	-0,847**	-0,843**	-0,796*
Dummy RTRADE	0,155*	0,153*	0,155*	0,165*	-0,086	-0,087*	-0,106**	-0,111**	-0,712***	-0,737***	-0,685***	-0,684***
Dummy FIRE	0,067	0,065	0,042	0,043	-0,053	-0,021	-0,021	-0,028	-0,204	-0,221	-0,072	-0,046
Dummy SERV	0,098	0,094	0,082	0,09	-0,067	-0,043	-0,061	-0,054	-0,556***	-0,591***	-0,493**	-0,476**
Predictor variables												
Envrionmental Pillar												
Resource Use		0	1,32E-06	0				0				-0,002
Emission		0,001	0,001	0,001				0,001				0,000**
Environmental Innovation		-0,001	-0,001	-0,001				0,001***				0,003**
Social Pillar												
Workforce			0,001	0		0,000	0,001	2,97E-05			-0,008**	-0,008**
Human Right			-0,001*	-0,002*		-3,783E-5**[2]	-4,1E-05***[2]	-3,818E-5*[2]			0,008***	0,008***
Community			0,000	0		-0,001	-1,96E-06	0			0,001	0,001
Product Responsibility			5,61E-05	-6,77E-05		0	0	0			-0,001	-0,001
Governance Pillar												
Management				0			0	0		-0,001	-0,002	-0,002
Shareholders				-2,98E-05			-0,00003176	-4,35E-05		7,03E-05	-8,18E-05	0,000
CSR Strategy				0,001			-0,002***	-0,002***		-0,001	-0,002	-0,002
R2	0,205	0,209	0,214	0,216	0,548	0,567	0,578	0,587	0,136	0,139	0,169	0,18
R2 adjusted	0,195	0,195	0,196	0,195	0,542	0,558	0,568	0,575	0,125	0,125	0,151	0,157
ΔR2 adjusted		0	0,001	-0,001		0,016	0,01	0,007		0	0,026	0,006
ΔF	19,93***	1,156	1,25	0,545	93,49***	6,79***	6,71***	5,28**	12,20***	0,78	6,92***	2,46*
F-ratio	19,93***	15,61***	12,24***	10,47***	93,49***	66,93***	58,14***	51,42***	12,20***	9,55***	9,16***	7,94***
F-ratio test of overall model significance; R2 is the coefficient of determination												
*p < 0,05, **p < 0,01, ***p < 0,001.												
NE en MAN reference categorie												
[2] polynoom tweede term	[3] polynoom derde term											

Figure 45: Multiple regression analysis EW, HW & EC 2006

	Environmental Wellbeing				Human Wellbeing				Economic Wellbeing			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	3,109	3,108	3,132	3,169	8,412	8,413	8,384	8,379	7,527	7,46	7,555	7,554
Control variables												
Region												
Dummy EE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dummy SE	0,164**	0,164*	0,164*	0,164*	-0,505***	-0,513***	-0,511***	-0,511***	-1,852***	-1,85***	-1,868***	-1,868***
Dummy WE	-0,038	-0,036	-0,034	-0,036	-0,003	-0,014	-0,013	-0,022	-1,256***	-1,252***	-1,281***	-1,281***
Industry												
Dummy MI	-0,014	-0,019	-0,01	-0,005	-0,077	-0,072	-0,073	-0,062	-0,097	-0,1	-0,085	-0,085
Dummy CON	-0,099	-0,098	-0,097	-0,101	-0,109*	-0,101	-0,099	-0,096	-0,15	-0,145	-0,122	-0,119
Dummy TRANS	-0,033	-0,037	-0,039	-0,035	-0,073*	-0,071	-0,061*	-0,051	-0,146	-0,139	-0,128	-0,133
Dummy WTRADE	-0,049	-0,050	-0,042	-0,053	-0,126	-0,146	-0,159*	-0,157*	-0,311	-0,314	-0,319	-0,318
Dummy RTRADE	0,055	0,059	0,068	0,069	-0,177***	-0,185***	-0,192***	-0,19***	-0,203	-0,211	-0,219	-0,209
Dummy FIRE	0,025	0,027	0,03	0,032	-0,077**	-0,072*	-0,072*	-0,071*	-0,122	-0,124	-0,096	-0,09
Dummy SERV	0,021	0,020	0,026	0,019	-0,131***	-0,126**	-0,136***	-0,131**	-0,146	-0,15	-0,139	-0,133
Predictor variables												
Envrionmental Pillar												
Resource Use		0,000	0,000	-3,61E-05				0,000				0,000
Emission		0,000	0,000	0,001				0,000				0,001
Environmental Innovation		0,000	0,000	0,000				0,001*				0,000
Social Pillar												
Workforce			-0,001	-0,001		0,000	-1,07E-05	0			-0,002	-0,002
Human Right			-0,001	-0,001		0,001	0,002	0,002			0,001	0,001
Community			0,001	0,001		-0,002	-0,002	-0,002			0,001	0,001
Product Responsibility			0,000	0,001		0,001	0,001	0,001			0,002	0,002
Governance Pillar												
Management				-0,001			0,001	0,001		0,001	0,001	0,001
Shareholders				0,000			0	0		0,000	0,000	0,000
CSR Strategy				0,000			-0,001*	-0,001*		-0,001	-0,002	-0,002
R2	0,035	0,036	0,044	0,048	0,369	0,389	0,399	0,405	0,487	0,489	0,495	0,495
R2 adjusted	0,02	0,016	0,017	0,015	0,359	0,373	0,38	0,382	0,479	0,478	0,481	0,478
ΔR2 adjusted		-0,004	0,001	-0,002		0,014	0,007	0,002		-0,001	0,003	-0,003
ΔF	2,314*	0,16	1,205	0,628	36,91***	3,10**	3,24*	1,708	59,95***	0,7	1,8	0,14
F-ratio	2,31*	1,77	1,63	1,47	36,91***	23,88***	20,68***	18,03***	59,95***	45,066***	34,442***	28,893***
F-ratio test of overall model significance; R2 is the coefficient of determination												
*p < 0,05, **p < 0,01, ***p < 0,001.												
NE en MAN reference categorie												
^{2} polynoom tweede term	^{3} polynoom derde term											