INFLUENCE OF CSR ON CORPORATE PERFORMANCE: A MULTI-DIMENSIONAL APPROACH

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Master thesis Strategic Management

Masterthesis in Strategic Management

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Table of contents

Section 1: Introduction

The role that businesses should fulfill in society has been debated for a long time. Traditionally, firms are expected to maximize their profits to benefit their shareholders. These are the ultimate owners of the business and should refrain from actions that limit potential shareholder profits (Berle, 1931; Friedman, 1970). However, Dodd (1932) recognized that this traditional view might not withstand the test of time and predicted that "*A sense of social responsibility toward employees, consumers, and the general public may thus come to be regarded as the appropriate attitude to be adopted by those who are engaged in business*.".

Now, almost ninety years later, it seems that the "appropriate" attitude has indeed evolved into one that takes social and corporate interests into account when making business decisions. A prime example of this changed attitude is the open letter of 79 CEOs, representing 2.1 trillion dollars in revenue, to the world leaders present at the Paris climate conference in 2015. In this letter, the CEOs state that they have a responsibility to "*engage actively in global efforts to reduce greenhouse gas emissions, and to help the world move to a low-carbon economy"* (Open Letter, 2015). Furthermore, it has become clear that 79% of the European general public is interested in companies that behave in a socially responsible way (European Commission, 2013a).

Firms not only face pressure to behave socially responsible from their consumers and competitors but also face increasing pressure from regulatory institutions. The EU actively promotes corporate social responsibility (CSR) activities in its member states but stated in its renewed CSR strategy that, in the view of the European Commission, firms should lead the development of CSR activities themselves (European Commission, 2011). The, for now, voluntary nature of CSR is, however, not undisputed. For example, in the Netherlands, a group of 20 full professors in corporate law has proposed to amend the law in such a way that it would be mandatory for firms to behave socially responsible (Winter et al., 2020).

While the business literature has discussed CSR in length, it has been quite challenging for researchers to define CSR (Malik, 2015). While the precise definition and dimensions of CSR used in this thesis will be discussed in section 2, it can be said that CSR refers to activities that are not required by law and benefit communities, the environment, and society as a whole (Cai, Jo & Pan, 2012). Therefore*, á contrario*, it follows that firms whose actions are (perceived to be) detrimental to society and the environment are (perceived to be) socially irresponsible and are likely to face increased pressure to increase their CSR activities.

This pressure is particularly likely to increase for manufacturing firms as they account for a significant portion of the global CO2 emissions and often offshore their activities (Dachs et al., 2012). Both of these activities are likely to result in (perceived) corporate irresponsibility and thus increased CSR pressure. CO2 emissions are harmful to the environment (Ingarao, 2017), and offshoring is seen as harmful to domestic jobs by the general public of high-income countries (Lacity & Rudramuniyaiah, 2009; Egger, Kreickemeier & Wrona, 2015).

Therefore, it is important for manufacturing firms to understand the precise effects CSR activities are expected to have on their performance. Unfortunately, researchers have not reached a consensus on what these effects might be (Barauskaite & Streimikiene, 2020). While most empirical studies report that CSR activities have a positive effect on corporate performance (Alshehhi et al., 2018), other studies have also found negative effects (Su et al., 2020) and neutral/no effects (Soana, 2011) on corporate performance.

Moreover, from a theoretical perspective, the effects of CSR activities on corporate performance are also mixed. Proponents of the negative effects of CSR on corporate performance often ground their argument in agency theory (Friedman, 1970; Masulis & Reza, 2015). In short, agency theory states that principals delegate work to agents who might act in their own interests rather than those of the principals (Eisenhardt, 1989). Concerning the negative effects of CSR, the agency problem is given form in the investments that CSR activities typically require. Managers (the agents) might, for example, overinvest in CSR activities at the cost of other investments to build a (private) reputation of being socially responsible at the costs of not maximizing profit potential, which, in this view, ultimately harms the shareholders (the principals) (Barnea & Rubin, 2010).

Theoretically, positive effects of CSR on corporate performance are often explained using stakeholder theory (Barauskaite & Streimikiene, 2020). Stakeholder theory assumes that by meeting the (implicit) expectations of various stakeholders, firms improve their reputation and build relationships with these stakeholders, which lowers firms' social costs and creates new market opportunities that lead to superior financial performance (Kao et al., 2018).

What is known in the business literature is that the effects of CSR are contingent upon the specific sector in which a firm is active (Daszynska-Zygadlo et al., 2016; Su et al., 2020), whether or not a firm competes in a developed economy (Su et al., 2020) and that the effects might also be contingent on the specific dimension of CSR that is being measured (Crifo et al., 2016). The objective of this thesis is to further the understanding of how the specific dimensions of CSR affect two specific dimensions of corporate performance: turnover and production costs. In the current business literature on CSR, findings of improved or decreased corporate performance are often explained using theoretical assumptions on how costs or turnover were affected. However, to the best knowledge of the authors of this thesis, these assumptions have not yet been tested empirically. Additionally, the interaction between social and environmental CSR has very rarely empirically been researched (see for an exception: Torgugsa et al., 2013), which results in a minimal understanding of how such interaction affects corporate performance overall, let alone how it affects turnover and production costs separately. It is not unlikely that possible interplay between these different dimensions explains (some of) the different findings in the business literature regarding the individual effects of environmental or social CSR on corporate performance (Torugsa et al., 2013). In summarization, this thesis aims to enhance our understanding of exactly how specific CSR activities affect corporate performance and further our understanding of how combining these different types of CSR activities affects corporate performance. This thesis, therefore, aims to answer the following research question:

To what extent do CSR' social and environmental dimensions affect the corporate performance of manufacturing firms either similarly or differently, and to what extent does the combination of both dimensions generate additional performance effects for manufacturing firms?

This thesis does this by answering two sub-questions distilled from this research question:

How do CSR's social and environmental dimensions, both separately and combined, affect the development of turnover?

and

How do CSR's social and environmental dimensions, both separately and combined, affect the development of production costs?

By answering these questions, this thesis contributes to the business literature in two ways. Firstly, by comparing the effects of the different dimensions on two types of performance indicators, costs and turnover, this thesis offers a more detailed understanding of how the different CSR dimensions separately affect the corporate performance of a (manufacturing) firm than, to the best knowledge of the author of this thesis, has been provided by the current business literature. Secondly, by researching the interaction effects of the different CSR dimensions, this thesis makes an important contribution to the business literature as empirical studies rarely consider any interaction effects between the different CSR dimensions (Pan, Sinha & Chen, 2021), which results in a limited understanding of how the interaction effect affects both dimensions of corporate performance.

The remainder of this thesis is structured as follows: section 2 delves deeper into the theory around the effects of CSR on corporate performance and contains hypotheses development. Section 3 explains the used methodology, and section 4 contains the results. This thesis concludes with a discussion of these results, the limitations of this research and it discusses several implications arising from the results for research and practice in section 5.

Section 2: Theoretical framework

In this section, this thesis reviews the theory related to CSR activities' effects on corporate performance to formulate hypotheses. Therefore, this section is structured as follows: Firstly, the main theoretical concepts relating to CSR and corporate performance will be defined. Secondly, the (inter)relationships between these concepts will be discussed, which will result in hypotheses. This section concludes with a theoretical model containing all the hypotheses to be tested.

Defining CSR

As stated above, CSR is a broad concept that is hard for researchers to define (Malik, 2015) but generally refers to voluntary activities that benefit the environment, communities, and society as a whole (Cai, Jo & Pan, 2012). The definition of Caroll (2008) is the most widely accepted in academic studies (Barauskaite & Streimikiene, 2020). In Caroll's view (2008), CSR encompasses *"(...) the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time".* These four building blocks form the so-called "CSR pyramid.

Carroll's argument for this definition can be summarized as follows: society expects at a minimum (at the base levels of the pyramid) that a firm is economically viable while at the same time conforming to the legal obligations imposed on it (Carroll, 2008). However, the expectations that society has of firms in Carroll's view are broader. According to Carroll, society also expects firms to act ethically and be good corporate citizens, which means that they have to act philanthropically. The difference between ethical and philanthropical expectations is that society punishes firms for failing to meet the ethical expectations (i.e., acting unethical) while society does not punish firms for failing to meet philanthropic expectations because these philanthropic activities are desired by the society but not expected in a moral or ethical sense (Carrol, 1991).

As firms' ethical and philanthropic activities are voluntary in the sense that they are not required by law, it is these types of activities that constitute CSR activities as commonly understood in the business literature. This thesis will therefore focus on these types of activities. However, as "ethical" and "philanthropical" activities are still enormously broad concepts, a further division in subdimensions is needed to understand the precise effects of CSR on corporate performance.

The triple bottom line perspective on CSR allows for this further division. This triple bottom line is the broadly accepted notion that CSR activities can be differentiated into three distinct dimensions: the environmental dimension, the social dimension, and the financial dimension (Pan, Sinha & Chen, 2020; Bansal, 2005).

In this perspective, the environmental dimension of CSR stresses the minimization of a firm's ecological footprint and argues that, in order for a firm to be socially responsible, it has to find ways to make production more environmentally friendly, i.e., more efficient and sustainable (Pan, Sinha & Chen, 2020). These environmental CSR activities will hereafter be referred to as corporate environmental responsibility (CER) activities. CER activities may, in a broad sense, include investments aimed at minimizing the environmental impact through the development of both ecologically friendly products and the development of ecologically friendly production processes. In a more narrow sense, CER refers only to investments in technologies and organizational concepts designed to limit the ecological impact of the production process. As the environmental dimension of CSR in the triple line perspective focuses on minimizing the ecological impact of the production process (Pan, Sinha & Chen, 2020), this thesis takes the more narrow interpretation of CER. CER activities that fit this narrow sense are, for example, using green energy in production or the use of systems that recapture any waste heat.

The social dimension encompasses the workplace and the community (Torugsa et al., 2013). Therefore, firms can act responsibly on this dimension by ensuring and enhancing the general well-being of their employees and being good corporate citizens (Pan et al., 2020). Firms can increase their employees' well-being through workplace innovation (WPI) as WPI works towards a convergence, rather than a trade-off, between enhanced corporate performance and enhanced employee well-being (Pot, 2017; Dhondt, 2012). WPI has received criticism in the business literature for being an "umbrella term" which lacks a clear conceptualization (Prus et al., 2017). This thesis follows the conceptualization based on the systematic literature review of Prus et al. (2017) to achieve conceptual clarity. Prus et al. (2017) conceptualize WPI as: *the heterogeneous process of renovation occurring in eight different dimensions, namely: work system, workplace democracy, high tech application, workplace boundaries, workspaces, people practices, workplace experience, and workplace culture.* Following this conceptualization, typical WPI activities aimed at increasing employee well-being are providing training, incorporating employee participation in decision-making, and providing meaningful, purposeful work. The second aspect of the social dimension, which is benefitting the community, can be achieved through community involvement and development and taking consumer's interests into account (European Commission, 2011). However, following Daszynska-Zygadlo et al. (2016), the thesis focuses only on the workplace aspect of the social dimension and will exclude the community aspect of the social dimension of CSR. Following this focus, this thesis will refer to workplace-related CSR activities as WPI activities as these activities are (also) aimed at increasing employee well-being.

For a firm to be socially responsible on the financial dimension of this perspective, it has to adjust its market behavior to emphasize long-term economic performance, exploit new market opportunities successfully, and contribute to the economy as a whole (Torugsa et al., 2013). In short: a firm has to have economic value for society. Because the economic value of manufacturing firms is not in question (Behun et al., 2018), which is not surprising as having economic value is the *raison d'être* of firms, it is unlikely that manufacturing firms will face pressure to increase this type of CSR activity. This thesis will therefore exclude activities with the sole purpose of increasing a firm's economic value. The firm's economic value itself, however, is incorporated in the dependent variables of turnover and production costs development.

Therefore, this thesis integrates the triple bottom line perspective with Carroll's definition to arrive at the following working definition of CSR activities: *voluntary activities taken by firms that benefit society at the environmental and/or social dimension*.

Defining manufacturing and corporate performance

As this thesis researches the effects of CSR activities on manufacturing firms' corporate performance, it is important to shortly elaborate on what these concepts entail exactly in the context of this thesis. This thesis follows the definition of Eurostat qua manufacturing, which defines manufacturing as "*the physical or chemical transformation of materials, substances or components into new products*" (Eurostat, 2020). This thesis, again following Eurostat, also considers substantial alteration, renovation, or reconstruction of goods as manufacturing (Eurostat, 2020). As stated in section 1, this thesis measures corporate performance on two performance indicators: the development of the costs and the development of the turnover. By doing this, this thesis acknowledges two distinct dimensions of corporate performance: the costs and the proceeds.

Hypotheses

CER and turnover development

This thesis will theorize the effects of CER on turnover development using stakeholder theory. In its most general sense, stakeholder theory argues that firms that meet their stakeholders' (implicit) interests will function more effectively and create more value (Kessler, 2013). Stakeholder theory is, however, an umbrella term for various types of stakeholder theories, namely either descriptive, normative or instrumental. (Jones et al., 2018; Donaldson & Preston, 1995; Friedman & Lewis, 2006). Used descriptively, stakeholder theory is used to describe corporate characteristics relating to a firm's stakeholders, such as how board members think about the interests of their stakeholders. Used normatively, stakeholder theory can be used as a basis for the development of categorical moral guidelines for managers, i.e., describing what to do because it is the right thing to do. When stakeholder theory is used instrumentally, it can explain how stakeholder management affects corporate performance. This thesis adopts an instrumental approach to stakeholder theory to theorize how CER activities affect corporate performance.

In 1995 Jones introduced the first explicit instrumental take on classical stakeholder theory. He combined economic concepts with behavioral science and ethics insights to explain why acting ethically should result in competitive advantage (Jones, 1995). The focal point in his explanation is the "contract," which he uses as a metaphor to describe both the formal and informal relationships a firm has with its stakeholders (Jones, 1995). Jones (1995) then applied the economic concepts of agency theory, transaction costs economics, and team production theory to the contracting between the firm and its stakeholders. Through this application, he identified several types of costs, such as monitoring and enforcing costs, that both contract parties incur to minimize opportunistic behavior stemming from the information asymmetry underlying all previously stated economic concepts (Jones, 1995). In the view of Jones, contract parties will keep incurring these costs to reduce opportunism to an "efficient" level, which is reached when the costs of further reducing opportunism no longer outweigh the benefits (Jones, 1995). Jones then states that the threat of opportunism can be reduced by the voluntary adaptation of standards or behavior that limit it, such as acting ethically and thus not "cheating" on a contract. When firms require a reputation for acting in such a way, the threat of opportunism reduces, and with it, the costs parties incur till the "efficient" level is reached (Jones, 1995). These lesser costs make moral firms a more attractive contracting partner compared to firms that behave opportunistically. This increased attractiveness is a source of competitive advantage for these moral firms as it results in increased eligibility to be a party in contracts that are unavailable to opportunistic firms.

The notion that by acting ethically and thus meeting stakeholder expectations, firms can create and capitalize on new market opportunities is still broadly accepted (Kao et al., 2018). However, the business literature has also identified another type of benefit that firms enjoy by meeting stakeholders' interests: the creation of sustainable, reciprocal relationships with these stakeholders (Kao et al., 2018; Jones et al., 2018). Jones et al. (2018) have identified several benefits that can accrue to firms from these relationships: the attraction of higher quality stakeholders, improved knowledge sharing, and lower transaction costs. In the view of this thesis, improved knowledge sharing, in the context of CER, merits extra attention as it enables a firm to understand better what its customers exactly want while at the same time enabling a firm to inform its customers of the specific value their product. This effect coincides, in the view of this thesis, with another benefit associated in the business literature with engaging stakeholders: pricing premiums (Rodriguez-Melo & Mansouri, 2011), as engaging stakeholders allows firms to create product offerings that match the demands of the stakeholders better.

Based on the theoretical reasoning above, it can reasonably be expected that firms that meet their stakeholders' expectations and act ethically perform better than firms that do not meet their stakeholders' expectations due to their capability to create and capitalize on (new) market opportunities and their capability to enjoy price premiums. Regarding CER, however, the question remains if, by deploying CER activities, firms meet stakeholder expectations and are (perceived to be) acting ethically. It does not seem like a stretch to assume this is the case given the widespread global marches held to urge political leaders to take steps to prevent (further) global warming (NRC, 2019), the reaching of the Paris Climate Agreement, and the widespread attention and urgency towards environmental issues (Kachanar et al., 2021). Therefore, by assuming that firms meet stakeholder interests by undertaking CER activities, firms that perform more CER activities should perform better than firms that undertake fewer CER activities. This theoretical assumption finds empirical support in the findings of Partadilou et al. (2020), who examined 45 companies listed in the Thomson Reuter Global Equity Index which operate in the food industry. They found that environmental initiatives bring financial benefits that exceed their implementation costs when measuring economic performance on three dimensions: shareholder loyalty, performance and client loyalty (Partadilou et al., 2020). Furthermore, research across various industries has shown that customers are willing to pay premiums for products produced in an environmentally responsible way (Torugsa et al., 2013; Rodriguez-Melo & Mansouri, 2011). Therefore, based on the above, this thesis derives the following hypothesis from the business literature regarding CER activities and turnover development:

H1a: CER activities increase the development of turnover

CER and production cost development

While CER activities might, for reasons stated above, have external (stakeholder) benefits, the nature of these activities might bring internal cost benefits for firms that undertake such activities as well. The work of Porter and Van der Linde (1995) helps to illustrate this. They see pollution as a manifestation of economic waste as it stems from an inefficient and incomplete utilization of resources which in turn require a firm to perform non-value creating activities such as the handling, storage and disposal of waste materials. Therefore, firms that minimize their environmental impact are increasing the efficiency and effectiveness with which they use their resources. In other words: they are increasing their resource productivity (Porter & Van der Linde, 1995). Increased resource productivity, in turn, can lead to cost advantages in several ways ranging from means of material saving to having to incur fewer costs related to the handling of ecologically dangerous waste materials produced during the production process (Porter & Van der Linde, 1995; Berrone 2009, Chang, 2011).

The notion that increased resource productivity leads to lower (production) costs has become generally accepted in the business literature (Jiménez, Vazquez-Burst, Plaza-Úbeda & Dijkshoorn, 2013; Weng, Chen & Chen, 2015). However, the question is whether or not this decrease in production costs ultimately weighs up against the implementation costs of CER activities. Porter and Van der Linde made their argument in 1995 and gave examples of ways to minimize pollution that they described as the “$10 bills waiting to be picked up” (Porter & Van der Linde, 1995), which implies that environmental improvement was easily achieved. Walley and Whitehead (1994) argued that once the "low-hanging fruits" have been identified and "plucked", further activities aimed at minimizing ecological impact can only be undertaken at substantially higher costs which are not necessarily won back. Similarly, the height of the costs associated with CER activities differs across sectors and is higher in traditionally polluting sectors, such as manufacturing (Konar & Cohen, 2001). Semenova and Hassel (2008) contribute these higher costs to the different inherent environmental industry risk levels. They state that, in general, industries with a higher risk of environmental pollution are regulated more strictly and complying with these stricter regulations requires more considerable capital costs than complying with less strict environmental regulations in non-polluting industries. Furthermore, while not argued explicitly by Semenova and Hassel (2008), it is likely that investments in CER activities aimed to minimize pollution are simply more expensive if the probability and/or severity of potential pollution are higher. In other words: it is easier and cheaper for a law firm to become a paperless office than it is for an oil firm to minimize the chance of an oil leak.

Empirical studies conducted on the effect of CER activities on the corporate performance of manufacturing firms seem to support the notion that the implementation costs of CER are not necessarily won back. Daszynska-Zygadlo et al. (2016) show, based on a worldwide sample of 2428 firms, that environmental CSR has a negative effect on corporate performance in different sectors, including materials and industrials. Su et al. (2020) reported similar findings of their analysis of 568 listed Chinese firms. They found that environmental CSR is detrimental to the corporate performance of Chinese firms in the capital-intensive manufacturing industry (Su et al., 2020). Additional support can be found in the findings of Xu, Wei and Lu (2019), who analyzed 569 listed Chinese firms that the Chinese Ministry of Environmental Protection monitored because of these firms' sizeable contribution to the polluting industrial emissions. They also found that an increase in CER usually leads to a decrease in corporate performance (Xu et al., 2019).

For reasons stated above, this thesis derives the following hypothesis regarding the effect of CER on the development of the production costs:

H1b: CER activities have a curvilinear effect (inversed U-shape) on the development of production costs.

WPI and turnover development

This thesis will theorize the effect of WPI on turnover development using the resource-based view (RBV). The RBV argues that a firm's internal resources are its source of competitive advantage (Barney, 1991). Accordingly, firms that possess superior resources enjoy superior corporate performance (Barney, 1991). In the words of Barney, resources encompass: "*all assets, capabilities, organizational processes, firm attributes, information, knowledge etc. (...) that enable the firm to conceive and* *implement strategies that improve its efficiency and effectiveness*" (Barney, 1991). Employees fit this definition and can be seen as a resource in the RBV (Collins, 2021). Therefore, according to the RBV, higher quality human resources should lead to better corporate performance. It is worth noting that the quality of human resources originates in the specific knowledge, skills, abilities, and other characteristics (KSAOs) of the individual employees (Ployhart et al., 2014). As a result, this section will focus on how WPI enables a firm to increase the amount and level of desirable KSAOs throughout the organization and thus increase the quality of its human resources. In this context, it is essential to note that while certain desirable KSAOs, such as specific skillsets or knowledge, can be learned, acquired, or increased, this is not necessarily the case for other KSAO's such as honesty (Ployhart, in press). Accordingly, this thesis will differentiate between the effects of WPI on the development of desirable KSAOs of existing personnel and the effects of WPI on the attraction of new personnel with desirable KSAOs.

Regarding the effects of WPI activities on the attraction of new personnel, its effect on a firm's reputation merits discussion. WPI activities aim to, at least collaterally, improve the well-being of employees while at the same improving corporate performance (Pot, 2017). Therefore, it can reasonably be expected that firms that undertake WPI activities increase their reputation as good employers and become more attractive to job-seekers. This expectation has empirically proven to be true in the case of typical WPI activities, such as the provision of training and measures to ensure work-life balance (Pfister, 2020). This increased attractiveness, in turn, helps firms to attract and retain skilled and talented employees as employees, *ceteris paribus,* prefer to work for firms with a high reputation (Roberts & Dowling, 2002) which increases the labor supply of a firm and thus the chances of finding and retaining talented personnel (Stuebs & Sun, 2010). The argument that increased reputation through WPI helps to attract and retain skilled and talented personnel can also be made using the work of Jones (1995), which has been explained in detail above. Put shortly, firms with a reputation as a good employer are less likely to behave opportunistically and thus have higher eligibility to be a party in contracts not available to other firms (Jones, 1995). This increased eligibility also results in the opportunity to contract with higher quality stakeholders (Jones et al., 2018), or in this specific context, to enter labor contracts with higher-quality personnel, that is, personnel with higher levels of desirable KSAOs.

WPI activities also affect the (further) development of desirable KSAOs of a firm's existing personnel. A simple example of this is the provision of training, resulting in (higher level of) relevant skills and knowledge. However, the positive effects of WPI on the KSAOs of existing personnel can also be theorized using social exchange theory (SET). SET argues that individuals tend to respond to a (perceived) beneficial action by returning a benefit as people generally feel the need to maintain balance in reciprocal relationships (Kessler, 2013). In the context of employment relationships, scholars have often used SET to theoretically explain the why behind the empirical findings that investments in employees result in reciprocal behavior of the employees in the form of higher levels of organizational citizenship behavior and higher levels of organizational commitment (Kehoe & Collins, 2017). As organizational citizenship behavior refers to "(…) *behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and in the aggregate promotes the efficient and effective functioning of the organization*" (Kehoe & Wright, 2013), it needs no further explanation that organizational citizenship is a desirable KSAO which is likely to increase (the development of) turnover. Likewise, a high(er) level of organizational commitment is a desirable characteristic in employees as it has been linked with various ways of increasing corporate performance. Most important for the development of turnover is that increased organizational commitment has been linked with higher levels of individual job performance (Wright & Bonnet, 2002), which in turn results in higher levels of overall corporate performance (Kehoe & Collins, 2017).

In conclusion, WPI activities allow a firm to attract employees with higher levels of KSAOs, and WPI activities increase the level of desirable KSAOs of the existing personnel. As the quality of a firm's human resources lies in the KSAOs of its employees, firms that employ WPI activities increase the quality of their human resources. According to the RBV, this increase in quality should lead to an increase in performance. Therefore, this thesis derives the following hypothesis on the effects of WPI on the development of turnover:

H2a: WPI activities increase the development of turnover.

WPI and the development of production costs

High levels of desirable KSAOs that lower the development of production costs can be achieved through the same process of attraction and development as described above. However, and perhaps unsurprisingly, the specific KSAOs relevant for production costs differ, and KSAOs that also affect turnover can be expected to affect production costs differently. Organizational commitment, for example, has also been linked to lower levels of employee absenteeism and employee turnover (Mathieu & Zajac, 1990), which lowers the cost of finding (temporary) replacements. Furthermore, it can be argued that, analogous to the argument of Porter & Van der Linde (1995), absenteeism and employee turnover can, in the same sense as pollution, be seen as economic waste, as they result from the non-optimal utilization of a firm's human resources which forces a firm to undertake non-value creating activities such as seeking and training (temporary) replacements. Similarly to resource productivity, increasing the effectiveness and efficiency with which a firm utilizes its human resources can then be said to increase its labor productivity, resulting in cost advantages.

Similar to CER activities' effect on production costs, the question remains whether or not the cure is worse than the disease when assessed from a strictly financial perspective. This question is particularly pressing for the context of this thesis as empirical studies on the social dimension of CSR in manufacturing firms show that this is not always the case. Daszynska-Zygadlo et al. (2016), for example, reported adverse effects of social CSR on corporate performance in four sectors, including industry. In a similar sense, Su et al. (2020) reported negative effects of social CSR on manufacturing companies' performance in the resource-intensive manufacturing sector. However, they also reported a positive effect of social CSR on the performance when manufacturing firms operated in the capital-intensive sector (Su et al., 2020). These different effects are contributed to the different nature of the different sectors. According to Su et al. (2020), the capital-intensive sector is characterized by the gathering of capital, technology and skilled personnel, whereas the cruciality of raw materials characterizes the resource-intensive sector. Firms that operate in the resource-intensive industry and engage in social CSR use up company resources that cannot be used in acquiring these crucial raw materials and, therefore, according to Su et al. (2020), suffer from decreased corporate performance.

Whether or not the implementation costs of WPI activities are won back, therefore, seems contingent on the importance of attracting and retaining employees with high levels of desirable KSAOs in a specific industry. Therefore, it is essential to note that the institutional context of this thesis research is the Netherlands, which manufacturing industry is specialized in capital-intensive manufacturing (European Commission, 2013b). Following this specialization, this thesis expects that it is crucial for Dutch manufacturing companies to attract and retain employees with high levels of desirable KSAOs. Based on this expectation and the theory discussed above, this thesis derives the following hypothesis regarding WPI and the development of production costs:

H2b: WPI activities reduce the development of production costs.

The interaction effects between CER and WPI

While the direct effects of CER and WPI on several dependent variables have received ample attention from researchers, interaction effects between these two dimensions are rarely researched. A notable exception is the study of Pan et al. (2021), who analyzed the CSR activities of 1436 distinct Chinese firms using data from three different sources. It is important to note that their dependent variable was eco-innovation. Their findings on the interaction effects between the different CSR dimensions are therefore not automatically generalizable to the interaction effects between these dimensions on corporate performance. However, this thesis will partially build on their work to hypothesize how the interaction between these dimensions affects the development of turnover and production costs. It will do this by discussing two ways in which it expects that the interaction between these dimensions affects corporate performance: its effect on a firm's internal processes and the combined external effect of both CSR dimensions on a firm's reputation.

Regarding the internal processes, it is important to note that interaction between both dimensions is likely to result in better environmental performance. Pan et al. (2021) found that social CSR positively moderated the relation between CER and sustainable environmental innovation (Pan et al., 2021). Pan et al. (2021) contributed this effect to two factors. Firstly, they stated that high social CSR increases the attractiveness of a firm to personnel with the relevant skills for CER activities which facilitates the undertaking of CER activities. Secondly, they contributed this effect to the capacity-building effects of social CSR, increasing the likelihood that firms step out of past innovation routines and efficiently engage current sustainable environmental innovation. In the view of Pan et al. (2021), this allows firms to gain experience in dealing with environmental issues quickly and, again in the view of Pan et al. (2021), increases the environmental awareness and commitment of a firm's employees, which results in these firms beginning with environmentally sustainable innovation ahead of the curve. Therefore, combining both WPI and CER is likely to increase the firm's environmental performance more than solely performing CER activities. The same benefits that have been identified from increasing environmental performance based on stakeholder theory and the notion of resource productivity should, therefore, at least theoretically, increase as well.

From a more external perspective, that is the impact the interaction effect is likely to have on a firm's reputation, positive effects on corporate performance can also be expected. This thesis finds justification for this expectation in the concept of CSR skepticism. CSR skepticism refers to the *public's inclination to question, disbelieve and distrust toward an organization's CSR motives (…), CSR outcomes and the claims of socially responsible positions and actions* (Rim & Kim, 2016). CSR skepticism has been shown to partially negate the stakeholder benefits that firms enjoy due to CSR activities through decreased word of mouth and retailer equity (Connors, MacDonald & Thomson, 2017). It is therefore important for firms to understand what causes CSR skepticism. Skarmeas and Leonidou (2013) explain the development of CSR skepticism using attribution theory. Attribution theory states that stakeholders attribute motives to firms' actions and these attributed motives subsequently determine the stakeholders' actions and behavior (Campbell & Kirmani, 2000). Skarmeas and Leonidou (2013) found that perceived self-serving motives, such as only engaging in CSR to meet stakeholder demands, contributed positively to CSR skepticism, while perceived value-driven motives negatively affected CSR skepticism. If firms are therefore perceived to engage in CSR activities because of intrinsic, value-driven motivation to be a socially responsible organization, they can expect to face less CSR skepticism and thus higher stakeholder benefits.

Whether or not stakeholders attribute self-serving or value-driven motives to a firm's CSR activities is not simply a matter of chance. One factor that plays a role in attributing a specific motive to CSR activities is reputation (Lii & Lee, 2012). CSR activities from a firm with a low CSR reputation face increased skepticism from stakeholders when compared to activities undertaken by firms with a high CSR reputation (Lii & Lee, 2012). In this context, it is relevant that firms that undertake CSR activities on only one dimension might gain a cumulative reputation that is ambiguous concerning their moral behavior (Jones, 1995). Suppose a firm, for example, does undertake activities to limit its ecological impact but does nothing to alleviate the poor working conditions of its employees. In that case, it cannot be readily said that such a firm is moral or, perhaps more fitting in the context of this thesis, socially responsible. However, if a firm practices CSR on all dimensions, its reputation suffers from (far) less ambiguity, increasing the likelihood that stakeholders attribute value-driven motives to its CSR activities. Therefore, combining CER and WPI ultimately should result in less CSR skepticism and thus higher stakeholder benefits.

Therefore, as the interaction effect of CER and WPI is likely to result in higher stakeholder benefits through both an increase in reputation and increased environmental performance, this thesis formulates the following hypothesis regarding the interaction effect on the development of turnover:

H3a: *The interaction effect between CER and WPI increases the development of turnover*

Increased environmental performance caused by CER activities has been hypothesized earlier in this thesis to have a inversed U-shaped effect on the development of production costs. As, as argued above, combining both CER and WPI is likely to increase environmental performance more than CER does on its own; this thesis expects that the interaction effect will amplify this inversed U-shape effect such that the development of production costs will reach its inflation point faster (i.e., the curve is steeper). However, combining CER and WPI does not only amplify environmental performance. When firms adopt both CER and WPI, they are likely to offer value-driven training to their employees to bolster their employees' environmental commitment (Pan et al., 2021). Such "green training" is also likely to succeed in enhancing employees' environmental commitment (Pinzone et al., 2016; Pham et al., 2019). As a result, combining both WPI and CER is likely to result in shared values between the employees and the firm. If an employee perceives that his or her values overlap with those of the firm, increased organizational commitment is generally the outcome (Kristof-Brown, 2000), which has, as argued above, beneficial effects on the development of production costs. This thesis expects that these benefits will, at least partially, negate the negative effects of increased environmental performance. This thesis expects this mitigation to result in a inversed U-shape more similar to the one expected for

CER activities, albeit that the inflation point might still be reached earlier. Therefore, the hypothesis on the interaction effect on the development of production costs is formulated as follows:

H3b: *The interaction effect between CER and WPI has a curvilinear effect (inversed U-shape) on the development of production costs.*

Conceptual model:

Summarizing, this thesis will test the following six hypotheses underlying the conceptual model shown in figure 1:

H1a: *CER activities increase the development of turnover.*

H1b: *CER activities have a curvilinear effect (inversed U-shape) on the development of production costs.*

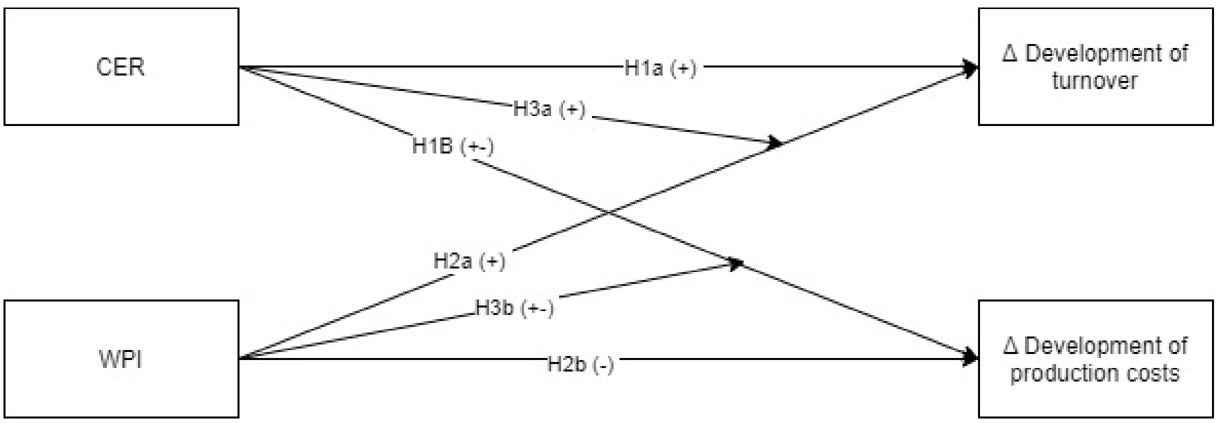
H2a: *WPI activities increase the development of turnover*

H2b: *WPI activities reduce the development of production costs.*

H3a: *The interaction effect between CER and WPI increases the development of turnover.*

H3b: *The interaction effect between CER and WPI has a curvilinear effect (inversed U-shape) on the development of production costs.*

Figure 1



Section 3: Methodology

In this section, the methodology will be set out, explained, and justified. This section is structured as follows: firstly, the research design will be set out. Secondly, the European Manufacturing Survey (EMS) and its background will be discussed. Thirdly, the operationalization of the variables and validity and reliability will be discussed. Fourthly, the statistical analysis method will be explained and justified. This section concludes with an elaboration on the ethical side of this research.

Research design

As stated in section 2, this thesis aims to test several hypotheses to contribute to the understanding of the effects of the different CSR dimensions on a firm's corporate performance. As these hypotheses are based on the current theoretical understanding of CSR effects in the business literature, in testing these hypotheses – and thus theory – this thesis follows a deductive approach (Saunders et al., 2019). While only testing these hypotheses could be characterized by a descriptive research goal, this thesis also seeks to explain any found or not found effects. As explaining results is impossible without first describing them, this thesis's goal is both descriptive and explanatory, also known as a descripto-explanatory research goal (Saunders et al., 2019).

In order to achieve this double goal, a mono-method quantitative research design is adopted. (Saunders et al., 2019). More specifically, this thesis will use a subset of the 2015 edition of the EMS consisting of Dutch manufacturing firms to test the hypotheses formulated in section 2. By statistically testing these hypotheses, the relationships between the variables become clear, ensuring that the descriptive part of the research goal is met. As will be explained later, this thesis uses multiple linear regression, which is an analysis method that also can be used for explanatory purposes (Hair et al., 2019) when any found or not found effects are explained through theoretical reasoning (Cornelissen, 2017; Sutton & Saw, 1995).

EMS background

The EMS is a Europe-wide survey conducted by a consortium of research institutes under the coordination of the German Fraunhofer Institute and is being conducted triennially at the firm level (Fraunhofer, n.d.).The survey seeks to gain insight into the innovation practices regarding the technological, organizational and business model aspects of manufacturing firms. It does this by asking respondents, which is asked to be either the CEO or the production manager, if certain technologies and organizational concepts are being used by a manufacturing firm and how much these technologies and concepts are actually implemented when compared to their potential maximum use in the respondent's firm. It was most recently carried out in 2018 (Fraunhofer, n.d.).

As stated above, this thesis will use a subset of the 2015 EMS data consisting of Dutch manufacturing firms. In the Netherlands, the EMS is distributed via post to *all* manufacturing firms with more than 10 employed persons and operate in one of the industries that fall under the SBI codes 15-39. It is important to note here that if a manufacturing firm has several plants/locations, the EMS is only sent to one of these plants/locations. The data necessary for the distribution of the survey is extracted from the Dutch Chamber of Commerce.

As a result of the focus of the Dutch EMS team on Dutch manufacturing firms with more than 10 employed persons which are active in industries that fall under SBI codes 15-39, the research unit of this thesis consists of firms that match these characteristics.

Operationalization

Firstly, the operationalization of the variables will be described, after which a summarization is given in the form of an operationalization table.

Independent variables: CER and WPI

CER activities are measured through the number of activities that firms have undertaken that minimize the ecological impact of their production process. CER activities, therefore, include the organizational concepts that limit energy usage and the technological concepts that limit ecological impact and other measures taken by firms to limit their energy usage. See table 1 for the specification of the CER related technologies and concepts. As a result of adding the number of organizational concepts, technological concepts and other measures employed by a firm, CER is a variable of ratio level with a range of 0 to 10. WPI will be measured through the number of activities taken by firms expected to increase employee well-being. WPI activities, therefore, include the organizational concepts that are expected to increase employee well-being and technological concepts that increase employee well-being. See table 1 for a specification of the WPI related technologies and organizational concepts. As a result of adding these organizational and technological concepts, WPI is a ratio variable with a range of 0 to 9.

Table 1: CER and WPI related technologies and concepts

CER related technologies/concepts	WPI related technologies/concepts
Certified energy management systems	**Job enrichment**
Incorporating sustainability in determining firm performance	**Measures to retain elderly workers or their knowledge**
The use of instruments for product-lifecycle analysis	**Instruments to increase organizational commitment**
Control systems which automatically shut down machines	**Standardized methods to ensure working safety**

Automated management systems for efficient production	**Financial participation opportunities for employees**
Systems for the recapture of kinetic and process energy	**Policies for competence-development**
Technologies for generating green energy	**The provision of training opportunities for production staff**
Early replacement of machines	**Technologies for safe robot-human interaction**
Improving the ecological efficiency of existing machines	**Separate area of responsibility for competence development and training**
Shutdown systems for parts, machines or installations when not in use	

Dependent variables: costs and turnover development

The development of turnover is measured by subtracting the reported turnover of 2012 from the reported turnover of 2014, divided by the turnover of 2012 and then multiplied by times 100% (Rooijmans, 2019). Development of turnover is therefore calculated using the following formula:

$$\text{Turnover development} = \frac{Turnover\ 2014 - turnover\ 2012}{turnover\ 2012}\ X\ 100\%$$

By measuring the reported turnover, this thesis adopts an accounting-based approach which brings the advantage of eliminating systematic market effects (Barauskaite & Streimikiene, 2020). The development of costs is measured through reported changes in the production costs, which have a limit of plus and minus 10%. By measuring both the changes in turnover and costs over time, these variables are trend variables. From a methodological point of view, trend variables are desirable as they allow for more accurate measurement of the effect of a predictor variable because trend variables suffer less from the effects of various other factors that can influence a dependent variable when compared to fixed variables (Rooijmans, 2019). As the development of production costs and turnover are expressed as percentages, they are variables of the ratio level.

Control variables

Building on Manresa et al. (2019) and Zoghi et al. (2010), the following control variables will be incorporated in the analysis: firm age, firm size, product complexity, innovation intensity and industry sector. Firm size, which in this thesis is measured through the number of employees and is thus ratio variable with a scale from 10 and with no upper limit, has been shown to affect firm performance (Beugeldijks & Smeets, 2008). The same holds for firm age (Manresa et al., 2019), which will be measured through the reported year of registration in the Dutch Chamber of Commerce and thus is also of the ratio level. Furthermore, as is common in the business literature, the sector in which a firm is active will be incorporated as a control variable of the nominal level to control for sector-specific effects on corporate financial performance.

Innovation intensity is measured through the number of implemented technological and organizational concepts that are neither CER nor WPI related. It is, therefore, a ratio variable with a scale of 0 to 28. This variable is incorporated to control for the effects of other innovations as innovativeness has been shown to positively affect corporate performance (Manresa et al., 2019). Product complexity, measured as either low, middle or high, is also incorporated as an ordinal control variable as product complexity has a positive effect on innovation and thus on corporate performance (Jiménez-Jiménez & Sanz-Valle, 2011; Manresa et al., 2019).

Operationalization table

The following table concludes the operationalization of the variables and provides a summary of the text above.

Table 2: Operationalization table

Type of variable	Name of variable	Item description	Min	Max	Measure level	Item number(s)
Dependent	Turnover	Turnover 2014 – Turnover 2012	- ∞	+ ∞	Ratio	17
	Production costs	Production costs	- 10%	+ 10%	Ratio	12
Predictor	CER	Number of specified[1] technologies/concepts	0	10	Ratio	3, 8.1 and 8.2
	WPI	Number of specified[1] technologies/concepts	0	9	Ratio	3, 4.3, 5.1, 5.2 & 8.1
Control	Firm size	Number of employees	10	+ ∞	Ratio	21
	Firm age	Age in numbers since the year of registration	0	+ ∞	Ratio	21
	Industry sector	Industry sector	0	5	Nominal	1.3
	Product complexity	Product complexity	0	2	Ordinal	19
	Innovation intensity	Number of other non-specified technologies/concepts	0	28	Ratio	3 & 8.1

1: See table 1 for which concepts have been identified as either CER or WPI related.

Validity and reliability of the EMS

The reliability and internal and external validity are ensured in several ways. Reliability, that is repeatability of the research (Saunders et al., 2019), was ensured through the formulation of the survey questions. The EMS does not ask respondents for opinions. Instead, it focuses on objective data such as whether or not certain technologies are used and other "hard" data such as performance levels. This focus increases the likelihood of finding consistent results. Internal validity, which is concerned with truly measuring the effect that is being researched (Saunders et al., 2019), is ensured by several means. Furthermost, the questions are detailed and the precise formulation of the questions is intensely discussed with representatives of 15 different countries. The internal validity is furthermore enhanced through pretesting the survey in several countries. External validity, which is concerned with the generalizability of the findings (Saunders et al., 2019), is, in the Netherlands, enhanced through two methods aimed at increasing response rates as a larger sample usually results in greater generalizability (Hair et al., 2019). The response rate is firstly increased through the offer of a free benchmark report which allows responding firms to compare themselves against their competitors. Firms are furthermore sent two reminders which also increases response rates and thus generalizability.

Analysis method

In all hypotheses, the dependent variables are continuous. Therefore, multiple linear regression analysis will be used for testing the hypotheses (Manresa et al., 2019). As the variables CER, WPI, innovation intensity, firm age, and firm size are all continuous, these variables can be incorporated into the analysis without transformation. On the other hand, industry sector and product complexity are categorical and will first have to be dummified before they can be used in the regression analysis (Hair et al., 2019).

For multiple linear regression, the sample size and the number of independent variables need to be considered. As the hypotheses contain three predictor variables (CER, WPI and their interaction) and five control variables (age, size, product complexity, innovation intensity and industry sector) will be used, the total number of independent variables is eight. With a significance level (alpha) of 0.05 and a power of 0.80, the sample size needs to be around 100 to find (admittedly small) R^2 values of 0.15 (Hair et al., 2019). As the control variables themselves will, in all likeliness, explain more than 15% of the variance, the risk of Type II error is limited even with a low sample size. Even so, a larger sample size results in more degrees of freedom which increases the generalizability of any findings (Hair et al., 2019). According to Hair et al. (2019), at least five observations per variable are necessary to ensure generalizability and statistical power. The conceptual model, as depicted in figure 1, therefore, needs a sample size of at least 40 valid observations. However, a range between 120 and 160 valid observations would be preferred given the model complexity (Hair et al., 2019).

The analysis will use hierarchical regression. Firstly, only the control variables will be included in the analysis, followed by the direct effects of the predictor variables. The analysis concludes with adding the moderator effects in the model. As every increase in model complexity will increase the R^2, the explanatory power of the more complex models will, following Hair et al. (2019), be judged through changes in the *adjusted* R^2.

Ethical aspects

As the EMS is already carried out and data from a subset of Dutch firms will be used, only data from respondents who agreed to further scientific use of their responses can be used. This data is also anonymized and will only be used for this thesis research. This thesis research does not yield any further ethical aspects that need to be addressed.

Section 4: Results

In this section, the results of the analyses are reported. Firstly, the process of data examination and transformation based on the univariate analysis and statistics are discussed. Secondly, the bivariate analyses and statistics are reported. Thirdly, the multivariate analyses and the results of the testing of the hypotheses are presented. Fourthly, and lastly, this section concludes with the results of several post-hoc analyses.

Univariate statistics

Univariate descriptive statistics were calculated for both the independent and dependent variables. The relevant statistics are shown for the metric variables in table 3, while the distribution for the categorical variables is shown in appendix A. Data from 177 respondents was used in the analysis. However, explorative analysis showed that from these 177 respondents, only 143 had valid responses on all variables. This results in a missing data percentage of 19.2%, above the ignorable rate of 10% (Hair et al., 2019). Further Missing Value Analysis (MVA) showed that the missing data was present in the turnover variable for 2014 (V23a1) and the age variable. Closer inspection of the turnover variable showed that cases with missing values for the turnover in 2014 all had a negative turnover of -99 in 2012. This indicated that the data for this variable was missing not at random (MNAR). As there is no objective method to empirically impute MNAR data (Hair et al., 2019), this thesis will not conduct imputation to replace these missing values but instead will exclude these cases from further analyses on the turnover variable. Furthermore, closer analysis of the turnover variable showed four cases with abnormally high negative scores, namely – 99. Further examination showed that these were also missing values and were subsequently deleted. Additionally, two cases that reported zero turnover in 2012 were subsequently deleted as these would result in a missing value in the development of turnover as this would result in a division by 0.

After deletion of these four outliers, the two cases with zero turnover in 2012 and the cases that had missing values on the turnover variable, another MVA was run, which showed that there were still 18 cases with missing data, or 11.5% of the total cases, all missing data on the age variable. Closer inspection of the age variable (V23m) showed no apparent explanation for the missing data. Little's MCAR test was subsequently performed to determine whether the data was missing completely at random (MCAR) or missing at random (MAR). As the test was non-significant c^2 (15, *N*=154) = 17.464, *p*=0.292, the missing data is MCAR. The missing values were subsequently imputed through mean substitution, which is the most commonly used imputation method and involves changing a missing value to the mean of that variable (Hair et al., 2019). After initial examination and imputation, univariate descriptive statistics were retrieved for all variables relevant for the conceptual model using 154 valid cases. The results of these descriptive analyses can be seen in table 3 for the continuous variables and in appendix A for the categorical variables.

Table 3: Univariate descriptive analysis						
Variable name	Mean	Std.Dev	Skewness	Kurtosis	Observed range	Theoretical range
WPI	3.67	1.92	0.271	0.045	0 to 9	0 to 9
CER	2.16	1.96	1.091	1.082	0 to 9	0 to 10
Innovation Intensity	9.21	4.79	0.598	0.065	0 to 24	0 to 28
DTurnover	10.73	30.35	0.394	6.542	-104 to 146,67	- ∞ to + ∞
Age	44.67	28.85	1.467	3.754	2 to 175	2 to + ∞
Size	111.86	633	11.89	144.803	10 to 7800	10 to + ∞

Table 3

What becomes clear from table 3 is that firms, on average, implement relatively few technologies and organizational concepts, regardless of whether or not they are WPI or CER related. Furthermore, the results show that firms, on average, enjoyed an increase in turnover of 10.73%. Regarding size, the large standard deviation implies the existence of outliers on that variable, and skewness and kurtosis statistics show the need for transformation. Following Field (2018) and Hair et al. (2019), several transformations were conducted to determine which transformation produced the best results regarding normality. More specifically, logarithmic transformation (LOG10) and inverse transformation were conducted as these are suitable for moderate and high levels of positive skewness, respectively (Tabachnick & Fidell, 1996). Of these transformations, the inverse produced the best results regarding normality. It is important to note that inverse transformation has consequences for the interpretation of the final results as the scores are mirrored. A small score on the newly transformed variable Size represents a large score on the original variable.

Bivariate statistics

After data cleaning and transformation as described above, bivariate analyses were conducted on the relevant variables for both regression models. The results of these bivariate analyses are shown in table 4.

Table 4: Bivariate descriptive statistics								
Variable		Variable						
		Size_INV	DTurnover	WPI	CER	Innovation Intensity	Firm Age	Production costs
Size_INV	r	1	-0.031	-0.034***	-0.379***	-0.474***	-0.71	-0.031
DTurnover	r	-0.031	1	0.020	0.006	0.082	-0.127	-0.060
WPI	r	-0.344***	0.020	1	0.425***	0.630***	-0.163***	-0.097
CER	r	-0.379***	0.006	0.425***	1	0.512***	0.048	-0.049
Innovation Intensity	r	-0.474***	0.082	0.630***	0.512***	1	-0.069	-0.192***
Firm Age	r	-0.71	-0.127	-0.163***	0.048	-0.069	1	0.157
Production costs	r	-0.031	-0.060	-0.097	-0.049	-0.192***	0.157	1
Significance levels:		*** p < ,1; ** p < ,05; *** p < ,01**						

Table 4 shows that the independent variables do not have problematically high correlations, as none of the correlations exceed 0.7 (Hair et al., 2019). However, the absence of high correlation values does not ensure the absence of (multi-)collinearity as (multi-)collinearity can also be the result of the interplay between more than two variables (Hair et al., 2019). Consequently, VIF values still will have to be examined in the section on the multivariate analysis. Furthermore, the lack of significant correlations between the development of turnover and the independent variables indicates that there will be no significant relationships between the development of turnover and the independent variables in the regression models. The same holds true for the development of production costs except for its negative correlation with innovation intensity (r=-0.192, N= 154, p=0.017), indicating that firms that innovate more generally enjoy a decrease in production costs.

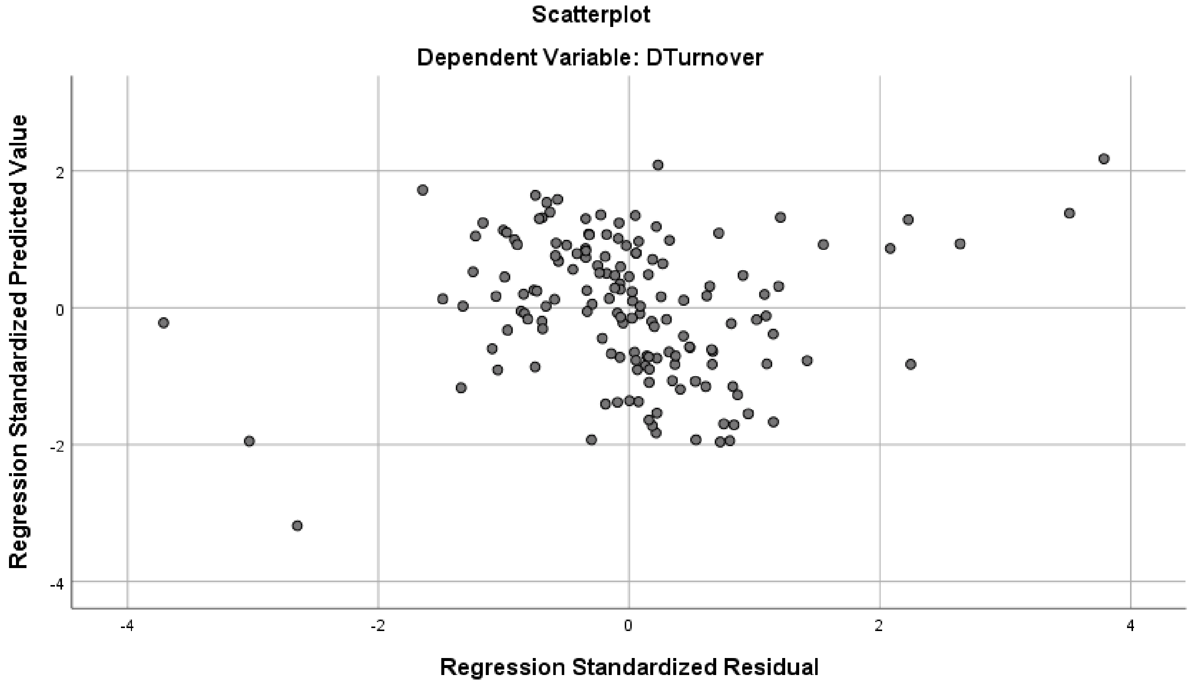
Table 4 furthermore shows that size correlates negatively with CER, innovation intensity, and the interaction between WPI and CER. As size is an inversed variable, this negative coefficient indicates that a larger score on size correlates with more implemented CER technologies/concepts (r= -0.379, N= 154 p=0.001) and other, neither CER or WPI related, technologies and concepts (r=-0.474, N=154, p=0.001). That larger firms implement more technologies and concepts and thus innovate more can be explained through the concept of "slack-resources". Slack resources are resources that a firm holds in excess compared to the minimum amount of resources a firm needs to function (Geiger & Cashen, 2002). Sharfmann et al. (1988) argued that larger firms are better capable of creating and storing excess resources and thus having more slack-resources. Greater slack, in turn, has been linked to greater levels of innovativeness as it shields firms from the consequences of failed experimentation (Bourgeois, 1981), thus explaining why size correlates positively with the implementation of new technologies and concepts i.e., being more innovative.

Additionally, WPI correlates positively with CER (*r*=0.425, *N*=154, *p*=0.001) and with innovation intensity (*r*=0.630, *N*=154, *p*=0.001), showing that implementation of WPI related concepts and technologies correlates with both implementation of CER related technologies and concepts and implementation of other, neither CER or WPI related, concepts and technologies. Firms that implement WPI or CER practices are thus likely to implement other technologies and practices. This implies that if firms innovate by implementing certain technologies and concepts on one specific dimension, they also innovate on other dimensions.

Multivariate statistics

Before multiple regression analyses can be conducted on the data, the assumptions underlying this statistical technique need to be tested. Hair et al. (2019) identify four different assumptions for multiple regression: linearity, homoscedasticity of the error terms, normality of error term distribution, and independence of the error terms.

Linearity and homoscedasticity have been examined through analysis of the residual plot. As can be seen in the residual plot, the data complies with the assumption of linearity. The data is, however, a bit clustered in the center of the plot. This is to be expected with a dependent variable that expresses the change in percentages as most firms do not perform exceptionally well or exceptionally worse. As heteroscedasticity causes inflated standard errors of the estimates, heteroscedasticity-consistent standard errors were calculated through the HCREG macro (Hayes & Cai, 2007) to determine the extent of heteroscedasticity using HC3 as this is generally the most appropriate to use (Hair et al., 2019). Comparing these heteroscedasticity-corrected standard errors with the standard errors calculated using regular multiple regression showed no large differences, indicating that any impact of any present heteroscedasticity is quite limited (Appendix B).



The normality of the error term distribution was examined through normal probability plots. As the lines closely follow the plotted diagonal, the distributions can be considered to be normally distributed (Appendix B & C). Lastly, the independence of the error terms was examined. This assumption is concerned with multicollinearity and was examined through VIF values. The regression model used in testing the hypotheses regarding turnover development showed no problematic multicollinearity as all VIF values were well below 10 (Appendix B; Field, 2018). Contrarily, the regression model used in testing the hypotheses regarding production costs did show problematic multicollinearity. The conceptual model regarding production costs hypothesized two curvilinear effects, namely from CER and the interaction between CER and WPI. This thesis therefore, as is common practice, incorporated both the linear as the polynomial terms. However, this caused problematic multicollinearity between CER's linear term and its polynomial term as the VIF value of the polynomial term was above 10 and the VIF value of the linear term was just below 10 (Appendix C; Field, 2018). Consequently, this thesis followed the approach recommended by Hair et al. (2019) for statistical significance testing of polynomial terms. They recommend to compare the different R^2 values of two equation models, the original model using linear terms and the original equation model with the added polynomial terms (Hair et al., 2019). The statistical significance of the incremental R^2 value is subsequently the appropriate statistic for assessing the statistical impact of the polynomial terms (Hair et al., 2019).

Hypotheses regarding turnover development

Table 5 shows the results of the several regression models. As becomes clear from table 5 and as explained in section 3, hierarchical regression analysis was used. Row A shows the results of the regression model which only incorporated the control variables while row B shows the results of the regression model with the added the direct effects of CER and WPI. Row C reports the results of the regression model which also incorporated the interaction effect between CER and WPI. Row C therefore shows the results of the complete regression model that was used to test the hypotheses regarding turnover development and those results will subsequently be reported.

Table 5: Regression analysis Turnover development			
Dependent variable: Turnover development			
	b (SE)	b (SE)	**b (SE)**
Control variables	A	B	**C**
Size (Inverted)	-12.621 (120.323)	-21.917 (123.540)	**-8.126 (124.320)**
Food industry	11.746 (10.858)	9.361 (9.847)	**9.150 (9.850)**
Textile industry	-12.911 (8.881)	-11.881 (9.090)	**-12.166 (9.095)**
Construction industry	-8.241 (10.422)	-7.447 (10.562)	**-7.207 (10.565)**
Chemical industry	11.077 (8.944)	11.667 (9.033)	**10.779 (9.078)**
Machinery industry	-2.399 (8.114)	-1.642 (8.282)	**-1.315 (8.288)**
Electronic industry	8.482 (8.062)	8.640 (8.154)	**9.100 (8.167)**
Firm Age	-0.106 (0.095)	-0.117 (0.097)	**-0.115 (0.097)**
Innovation intensity	0.371 (0.595)	0.687 (0.776)	**0.770 (0.781)**
Complex products	0.085 (0.314)	0.067 (0.317)	**0.080 (0.318)**
Simple products	-0.408 (6.030)	-0.157 (6.141)	**0.267 (6.156)**
Predictor variables			
WPI	-	-1.160 (1.772)	**-1.178 (1.773)**
CER	-	-0.208 (1.605)	**0.313 (1.688)**
CER_centered * WPI_centered (Interaction)	-	-	**-0.583 (0.586)**
Model summary			
F-value	1.226	1.063	**1.057**
F-change	-	0.235	**0.990**
R^2	0.087	0.090	**0.096**
R^2 change	-	0,003	**0,006**
N	154	154	**154**
Significance levels:	*** p < ,1; ** p < ,05; *** p < ,01**		

The final regression model incorporating both the direct and interaction effect had poor model fit adj. R^2 = 0.005, *F*(14, 139)=1.057, *p*= 0.402 and was thus not well suited to explain the development of turnover. Hypothesis 1a stated that a higher number of implemented CER related technologies and concepts results in increased turnover development. However, this thesis did not find any significant relationship between CER and the development of turnover *b*=0.313 *t*(139)=0.185 *p*=0.853 leading to the rejection of hypothesis 1. Hypothesis 2a stated that a higher number of WPI related technologies and concepts would result in higher turnover development. This thesis also failed to find support for hypothesis 2a as WPI had no significant relationship with the development of turnover *b*= -1.178 *t*(139)= -0.665 *p*=0.507. As a result, hypothesis 2a is also rejected. Hypothesis 3a stated that the interaction between CER and WPI should also result in a higher turnover development. However, this thesis failed to confirm this relationship as no significant relationship was found *b*=-0.583 *t*(139)=-0.995, *p*=0.321, thus leading to the rejection of hypothesis 3a.

Hypotheses regarding production costs

In table 6 the regression results of the analyses on the development of the production costs are shown. Row A shows the results of the model that only incorporated the control variables while row B shows the results of incorporating the direct effects of WPI and CER and their linear interaction term into the regression model. The regression model reported in row C also incorporated the polynomial terms and is thus the final regression model and these results will be reported.

Table 6: Regression analysis Production costs development			
Dependent variable: Production costs development			
	b (SE)	b (SE)	**b (SE)**
Control variables	A	B	**C**
Size (Inverted)	-6.828 (5.059)	-6.165 (5.232)	**-6.019 (5.251)**
Food industry	-0.169 (0.395)	-0.272 (0.414)	**-0.136 (0.429)**
Textile industry	-0.286 (0.373)	-0.350 (0.383)	**-0.284 (0.388)**
Construction industry	-0.151 (0.438)	-0.182 (0.445)	**-0.092 (0.451)**
Chemical industry	-0.439 (0.376)	-0.451 (0.382)	**-0.444 (0.383)**
Machinery industry	-0.091 (0.339)	-0.116 (0.349)	**-0.111 (0.350)**
Electronic industry	0.082 (0.339)	-0.081 (0.344)	**-0.023 (0.348)**
Firm Age	0.007 (0.004)*	0.007 (0.004)*	**0.007 (0.004)**
Innovation intensity	-0.067 (0.025)***	-0.089 (0.033)***	**-0.090 (0.033)*** **
Complex products	-0.012 (0.013)	-0.012 (0.013)	**-0.012 (0.013)**
Simple products	-0.184 (0.254)	-0.225 (0.259)	**-0.224 (0.259)**
Predictor variables			
WPI	-	0.048 (0.075)	**0.031 (0.077)**
CER	-	0.035 (0.071)	**0.208 (0.167)**
WPI_centered * CER_centered = Interaction	-	0.012 (0.025)	**0.005 (0.039)**
CER *CER	-	-	**-0.031 (0.026)**
(CER_centered * WPI_centered)^2 = Interaction	-	-	**0.002 (0.002)**
Model summary			
F-value	1.381	1.157	**1.107**
F-change	-	0.398	**0.782**
R^2	0.097	0.104	**0.114**
R^2 change	-	0.008	**0.010**
N	154	154	**154**
Significance levels:	*** p < ,1; ** p < ,05; *** p < ,01**		

Table 6 shows that the model was better able to explain the change in production costs than the development of turnover, but it still has not a good model fit: *adj.* R^2 = 0.11 *F*(16, 137)= 1.107, *p*= 0.355. This thesis also failed to find the hypothesized relationships on the change in production costs. Hypothesis 1b predicted a curvilinear (inverse U shape) relationship between CER and production costs, but this effect was non-significant *b*=-0.031 *t*(137)=-1.172 *p*=0.243. Furthermore, the incremental R^2 change was non-significant when the polynomial term was added to the model *F-change*(2, 137)=0.782, *p*=0.460, thus leading to the rejection of hypothesis 1b. Hypothesis 2b predicted a decrease in production costs as the number of WPI related technologies and concepts increased, but this relationship was also non-significant *b*= 0.031 *t*(137)=0.401 *p*=0.689. As a result, hypothesis 2b was also rejected. Hypothesis 3b hypothesized that the interaction between CER and WPI would have a curvilinear effect on production costs as this interaction could be expected to increase environmental performance, which has been argued above to result in an inverse U-shape, and organizational commitment, which has been linked with decreased costs. However, this relationship was also statistically non-significant *b*=0.002 *t*(137)= 0.751, *p*=0.416. Similarly to the curvilinear effect of CER, the incremental R^2 change was also non-significant *F-change*(2, 137)=0.782, *p*=0.460, and hypothesis 3b was therefore also rejected.

Post-Hoc analyses

The number of implemented CER and WPI related technologies failed to significantly explain production cost and turnover development. In order to find any possible explanations for why the relationships were non-significant, this thesis has performed three post-hoc analyses. Firstly, as a validity check, this thesis reran the multiple regression analyses but this time with the extent of the realized potential of any implemented technologies and concepts as the independent variables. The extent of the realized potential reflects the degree of implementation of a specific technology or organizational concept compared to the potential maximum use in the respondent's firm and can either be low, middle or high. By summing the realized potential of technologies and concepts that are CER or WPI related, the degree of implementation of either CER and WPI is measured, which might explain the development of turnover and production costs more accurately. Secondly, the type of customer a firms services was incorporated into the analysis as prior research shows that private consumers value social performance more than businesses do (Baron et al., 2009), which might result in stronger effects for firms that service private consumers. Thirdly, social performance is costly and less rewarding in sectors which depend on large, low-cost workforces (Porter & Kramer, 2006; Daszynska-Zygadlo et al., 2016). As large, low-cost workforces are typically not highly educated, the education level is used as a proxy for the type of workforce. Education level is therefore incorporated in the analysis to determine if the education level of the employees, and thus the type of workforce, affects how CER and WPI influence the development of turnover and production costs.

The realized potential of CER and WPI

Unfortunately, data on the realized potential of three CER related variables (premature replacement of machines, upgrading of existing machinery, and switching of components and machines when they are not in use) was not available. The same holds true for the data on the realized potential of three

WPI related variables (existence programs for competence development, existence of days per year for qualification and continuous improvement and the existence of separate area of responsibility for competence development). This thesis choose not to exclude these variables from the post-hoc analyses but instead incorporate them in the same manner as the original analyses.

Table 7: Regression analysis Turnover development (Realized potential)			
	Dependent variable: Turnover development		
	b (SE)	b (SE)	**b (SE)**
Control variables	A	B	**C**
Size (Inverted)	-12.621 (120.323)	-15.164 (122.223)	**-3.702 (122.446)**
Food industry	11.746 (10.858)	8.227 (9.694)	**-7.790 (9.688)**
Textile industry	-12.911 (8.881)	-12.337 (9.099)	**-13.144 (9.113)**
Construction industry	-8.241 (10.422)	-7.955 (10.528)	**-8.166 (10.515)**
Chemical industry	11.077 (8.944)	11.227 (9.018)	**10.539 (9.025)**
Machinery industry	-2.399 (8.114)	-1.883 (8.307)	**-1.396 (8.307)**
Electronic industry	8.482 (8.062)	8.543 (8.158)	**8.917 (8.153)**
Firm Age	-0.106 (0.095)	-0.112 (0.097)	**-0.108 (0.097)**
Innovation intensity	0.371 (0.595)	0.531 (0.769)	**0.600 (0.760)**
Complex products	0.085 (0.314)	0.078 (0.317)	**0.094 (0.317)**
Simple products	-0.408 (6.030)	-0.398 (6.140)	**0.041 (6.143)**
Predictor variables			
Realized potential of WPI (WPIRP)	-	-0.309 (0.841)	**-0.193 (0.845)**
Realized potential of CER (CERRP)	-	0.039 (0.971)	**-0.316 (1.016)**
CERRP_centered * WPIRP_centered (Interaction)	-	-	**-0.199 (0.169)**
Model summary			
F-value	1.226	1.035	**1.062**
F-change	-	0.071	**1.381**
R^2	0.087	0.088	**0.097**
R^2 change	-	0.001	**0.009**
N	154	154	**154**
Significance levels:	*** p < ,1; ** p < ,05; *** p < ,01**		

Table 7 shows the hierarchical regression results of the analysis of the regression model which used the realized potential of the variables to explain the development of turnover. Row A shows the results of the regression model which only incorporated the control variables. Row B shows the results of the regression model which added the direct effects of the realized potential of WPI and CER. Row C shows the results of the regression model which added the interaction term of the realized potential of WPI and CER.

The regression model using realized potential of CER and WPI related technologies and concepts to explain turnover development was a minimally better fit for the data than the original regression model: adj. R^2= 0.006, F(14, 139)=1.062, p= 0.397 versus adj. R^2 = 0.005, $F(14, 139)$=1.057, p= 0.402 of the original regression model. As becomes clear from table 7 and similar to the original regression model, the regression model using the realized potential also failed to find significant relationships between turnover development and the realized potential of CER b=0.316 $t(139)$= 0.311, p=0.756, between turnover development and the realized potential of WPI b= -0.193 $t(139)$= 0.228, p=0.820 and between turnover and the interaction between WPI and CER b= -0.199 $t(139)$= -1.175, p=0.242. Consequently, all of the hypothesized relationships for turnover development are also rejected when using the realized potential of the variables.

Table 8 shows the regression results of the analysis using the realized potential of the variables to explain the development of production costs. Row A shows the results of the model that only incorporated the control variables while row B shows the results of incorporating the direct effects of WPI and CER and their linear interaction term into the regression model. The regression model reported in row C also incorporated the polynomial terms and is thus the final regression model

Table 8: Regression analysis Production costs development (Realized potential)			
Dependent variable: Production costs development			
	b (SE)	b (SE)	**b (SE)**
Control variables	A	B	**C**
Size (Inverted)	-6.828 (5.059)	-6.527 (5.111)	**-6.378 (5.136)**
Food industry	-0.169 (0.395)	-0.310 (0.404)	**-0.251 (0.415)**
Textile industry	-0.286 (0.373)	-0.392 (0.380)	**-0.347 (0.386)**
Construction industry	-0.151 (0.438)	-0.216 (0.439)	**-0.190 (0.442)**
Chemical industry	-0.439 (0.376)	-0.473 (0.377)	**-0.466 (0.378)**
Machinery industry	-0.091 (0.339)	-0.206 (0.347)	**-0.183 (0.350)**
Electronic industry	0.082 (0.339)	-0.107 (0.340)	**-0.081 (0.344)**
Firm Age	0.007 (0.004)*	0.008 (0.004)*	**0.007 (0.004)***
Innovation intensity	-0.067 (0.025)***	-0.098 (0.032)***	**-0.099 (0.032)*****
Complex products	-0.012 (0.013)	-0.011 (0.013)	**-0.011 (0.013)**
Simple products	-0.184 (0.254)	-0.174 (0.256	**-0.186 (0.258)**
Predictor variables			
Realized potential of WPI (WPIRP)		0.066 (0.035)*	**0.061 (0.036)***
Realized potential of CER (CERRP)		-0.006 (0.042)	**0.070 (0.098)**
CERRP_centered * WPIRP_centered = Interaction		0.000 (0.007)	**0.005 (0.011)**
CERRP * CERRP			**-0.007 (0.009)**
(CERRP_centered * WPIRP_centered)^2 = Interaction^2			**-8.844e-6 (0.000)**
Model summary			
F-value	1.381	1.344	**1.217**
F-change	-	1.189	**0.404**
R^2	0.097	0.119	**0.124**
R^2 change	-	0.023	**0.005**
N	154	154	**154**
Significance levels:	*** p < ,1; ** p < ,05; *** p < ,01**		

The regression model using the realized potential of CER and WPI to explain the development of production costs has better model fit: adj. R^2=0.022, $F(16, 137)$=1.217, p=0.263 when compared to the original regression model adj. R^2 = 0.014 $F(1, 139)$= 1.158, p= 0.315. Unfortunately, the explanatory power is still minimal as the new model only explains 2.2% of the variance. Table 8 furthermore shows that new regression model also failed to find statistical proof for the hypothesized relationships. The realized potential of CER did not have a statistically significant curvilinear effect on the development of production costs *b*=-0.002 *t*(139)= -0.396, *p*=0.693 and the incremental R^2 increase when the polynomial terms were added to the model was also non-significant *F-change*(2, 137)=0.404, *p*=0.669. Consequently, hypothesis 1b also is rejected when using the realized potential of the variables. The realized potential of WPI did not affect production costs at 95% confidence interval. However it did at the confidence interval of 90%: *b*= 0.061 *t*(137)= 1.706, *p*=0.090. This finding suggests that stepping up the implementation of WPI activities has an adverse effect on the development of production costs as it correlates with an increase of the production costs which was the opposite of what was hypothesized. Hypothesis 2b is thus also rejected when using the realized potential of the variables. The interaction effect of the realized potential of CER and WPI also did not have a significant curvilinear effect on the development of production costs *b*= -8.844e-6 *t*(137)= -0.089, *p*=0.930 and the incremental R^2 increase was also non-significant *F-change*(2, 137)=0.404, *p*=0.669. Consequently, hypothesis 3b is also rejected when using the realized potential of the variables.

Customer type

Respondents were asked whether they produced finished goods for consumers or for industrial businesses. As the literature does not specify what dimension of social performance is valued more by consumers (Baron et al., 2009), an interaction term between CER and the customer type and an interaction term between WPI and the customer type was created. As this post-hoc analysis focusses on the proposed stronger stakeholder benefits from consumers, it only discusses the effect of customer type on the development of turnover. This thesis used hierarchical regression to test two different regression models based on the customer type to determine if incorporating the customer type results in a better model than the regression model used in testing the original hypotheses. More specifically: one model used the customer type and WPI to explain the turnover development and the other regression model used the customer type and CER to explain the development of turnover. The results these analyses are shown in table 9. Row A shows the results of the regression model which incorporated the direct effects of the customer type and WPI, row B shows the results when their interaction effect was incorporated into the analysis. Row C shows the results of the regression model incorporating the direct effects of the customer type and CER, row D subsequently shows the results when this interaction effect was incorporated in the analysis. Consequently, the change statistics in row D reflect the changes from the regression model in row C.

Table 9: Regression analysis Turnover development (Customer type)				
Dependent variable: Turnover development				
	b (SE)	b (SE)	b (SE)	b (SE)
Control variables	A	B	C	D
Size (Inverted)	-20.496 (121.272)	19.243 (121.540)	-19.820 (123.470)	-17.651 (123.486)
Food industry	7.662 (10.260)	7.363 (10.292)	6.139 (9.947)	6.596 (9.957)
Textile industry	-12.798 (9.147)	-13.121 (9.180)	-13.460 (9.122)	-14.222 (9.154)
Construction industry	-7.581 (10.551)	-7.428 (10.576)	-8.439 (10.489)	-8.376 (10.489)
Chemical industry	11.037 (9.103)	10.953 (9.123)	10.495 (9.068)	10.381 (9.068)
Machinery industry	-1.448 (8.250)	-1.388 (8.267)	-2.320 (8.185)	-2.735 (8.195)
Electronic industry	8.519 (8.120)	8.738 (8.144)	8.100 (8.153)	8.338 (8.156)
Firm Age	-0.115 (0.097)	-0.115 (0.097)	-0.102 (0.095)	-0.100 (0.095)
Innovation intensity	0.650 (0.731)	0.652 (0.732)	0.452 (0.674)	0.473 (0.674)
Complex products	0.065 (0.317)	0.061 (0.318)	0.085 (0.316)	0.080 (0.316)
Simple products	-0.378 (6.063)	-0.386 (6.076)	-0.308 (6.145)	-1.189 (6.207)
Predictor variables				
Producer finished goods for consumers	3.881 (7.613)	4.645 (7.720)	4.324 (7.589)	4.076 (7.593)
WPI	-1.101 (1.767)	-3.901 (4.681)	-	-
Customertype_recoded *	-	2.487 (3.849)	-	-
CER	-	-	-0.326 (1.595)	-4.326 (4.295)
Customertype_recoded * CER_centered	-	-	-	3.430 (3.419)
Model summary				
F-value	1.083	1.031	1.054	1.051
F-change	-	0.417	-	1.006
R^2	0.091	0.094	0.089	0.096
R^2 change	-	0.003	-	0.007
N	154	154	154	154
Significance levels:	*** p < ,1; ** p < ,05; *** p < ,01**			

The regression model incorporating the interaction between CER and customer type had similar fit (adj. R^2 = 0.005, *F*(14, 139)=1.051, *p*= 0.408) as the regression model used in testing the hypotheses (adj. R^2 = 0.005, *F*(14, 139)=1.057, *p*= 0.402). The model incorporating the interaction between WPI and customer type on the other hand, had slightly worse fit (adj. R^2 = 0.003, *F*(14, 139)=1.031, *p*= 0.426 than the original regression model (adj. R^2 = 0.005, *F*(14, 139)=1.057, *p*= 0.402). Table 9 furthermore shows that customer type does not significantly increase the effects of CER *b*= 3.430, *t*(139)= 1.003, *p*=0.318 or the effects of WPI *b*= 2.487, *t*(139)= 0.646, *p*=0.519. The regression model using the realized potential of the variables showed roughly similar results (Appendix D). The customer type therefore seems to not influence the effects of either CER or WPI on the development of turnover and the regression models incorporating the customer type did not have better model fit than the regression model used in testing the hypotheses.

Education level employees

As stated above, the education level of the employees was incorporated to determine if, and how, the type of workforce influences the effects WPI and CER have on turnover and production costs development as social performance is costly and less rewarding for firms with a large, low-cost workforce. Respondents gave the percentage level of employees who received graduate or PhD level education. An interaction term between this percentage and WPI and between this percentage and CER was created to see how the education level of the employees, and thus the workforce type, influences the effects WPI and CER activities have on a firm. The regression models furthermore incorporated the direct effect of the education level on turnover and production costs development.

Similarly to the post-hoc analysis on the effect of customer type, this thesis used hierarchical regression to test two different regression models to determine if incorporating the education level results in a better model than the regression model used in testing the original hypotheses. More specifically this thesis ran one regression model which used the education level and WPI to explain the turnover development and another regression model which used the education level and CER to explain the development of turnover. The results these analyses are shown in table 10. Row A shows the results of the regression model which incorporated the direct effects of the education level and WPI, row B shows the results when their interaction effect was incorporated into the analysis. Row C shows the results of the regression model incorporating the direct effects of the education level and CER, row D subsequently shows the results when this interaction effect was incorporated in the analysis. Consequently, the change statistics in row D reflect the changes from the regression model in row C.

Table 10: Regression analysis Turnover development (Education level)				
	Dependent variable: Turnover development			
	b (SE)	b (SE)	b (SE)	b (SE)
Control variables	A	B	C	D
Size (Inverted)	-39.720 (120.203)	-23.794 (120.427)	-33.771 (122.292)	-33.715 (122.508)
Food industry	7.340 (9.714)	7.354 (9.686)	5.469 (9.504)	6.350 (9.601)
Textile industry	-13.995 (8.965)	-14.663 (8.952)	-14.883 (8.988)	14.485 (9.021)
Construction industry	-8.076 (10.420)	-8.791 (10.403)	-9.058 (10.374)	-9.275 (10.396)
Chemical industry	9.945 (8.955)	10.527 (8.939)	9.349 (8.945)	9.873 (8.991)
Machinery industry	-6.534 (8.535)	-6.378 (8.511)	-7.424 (8.490)	-7.827 (8.524)
Electronic industry	5.221 (8.208)	5.001 (8.186)	4.951 (8.244)	4.497 (8.282)
Firm Age	-0.106 (0.096)	-0.129 (0.097)	-0.091 (0.094)	-0.093 (0.095)
Innovation intensity	0.695 (0.722)	0.634 (0.721)	0.391 (0.665)	0.410 (0.667)
Complex products	0.095 (0.313)	0.093 (0.312)	0.118 (0.313)	0.113 (0.314)
Simple products	1.454 (6.051)	1.130 (6.038)	1.337 (6.127)	0.947 (6.162)
Predictor variables				
Education level	0.373 (0.191)*	0.359 (0.191)*	0.363 (0.192)*	0.317 (0.203)
WPI	-1.373 (1.740)	-1.782 (1.761)	-	-
Education_centered * WPI_centered	-	-0.154 (0.114)	-	-
CER	-	-	-0.121 (1.581)	-0.450 (1.650)
Education_centered * CER_centered	-		-	-0.085 (0.120)
Model summary				
F-value	1.383	1.422	1.330	1.266
F-change	-	1.827	-	0.506
R^2	0.114	0.125	0.110	0.113
R^2 change	-	0.011	-	0.003
N	154	154	154	154
Significance levels:	*** p < ,1; ** p < ,05; *** p < ,01**			

The regression model incorporating the interaction between WPI and the education level had notably better fit with the data (adj. R^2=0.037, F(14, 139)=1.422, p=0.150) than the original model used in testing the hypotheses (adj. R^2 = 0.005, F(14, 139)=1.057, p= 0.402). The same holds true for the regression model which incorporated the interaction between the education level and CER (adj. R^2=0.024, F(14, 139)=1.266, p=0.236). As becomes clear from table 10, the education level was significant at the 90% confidence interval in the model incorporating the interaction between WPI and the education level b= 0.359 t(139)= 1.883, p=0.062 while it was non-significant in the model incorporating the between the education level and CER b= 0.317 t(139)= 1.566, p=0.120. Comparing rows C and D shows that this is due the introduction of the interaction effect between the education level and CER, thus implying that education itself and its interaction with CER explain the same variance. Table 9 furthermore shows that neither the interaction effect between the education level and WPI is significant b= -0.154 t(139)= -1.352, p=0.179 nor is the interaction between the education level and CER b= -0.085 t(139)= -0.712, p=0.478.

The education level of the employees therefore seems to have no influence on the effects of CSR activities on turnover development but its autonomous effect seems to be positive on the development of turnover. For the regression model incorporating the interaction effect between the education level and WPI using the realized potential showed roughly similar result (Appendix E). However, using the realized potential of the variables used in the regression model incorporating the interaction between CER and the education level proved to be impossible with SPSS. The minimum tolerance level needed in order for SPSS to incorporate the variables into the analysis was too low (lower than 0.000001) for either the education level or its interaction with the (centered) realized potential of CER. Due to this extreme multicollinearity between the education level and its interaction with the realized potential of CER, no meaningful interpretation of this regression model, with regard to these variables, can be given.

The results of the regression models on the development of production costs are shown in table 11. As stated above, this thesis used hierarchical regression to test two different regression models to determine if incorporating the education level results in a model with better model fit than the regression model used in testing the original hypotheses. Consequently, the hypothesized curvilinear effects of CER and the interaction between CER and WPI have been omitted from these analyses. Row A shows the results of the regression model which incorporated the direct effects of the education level and WPI, row B shows the results when their interaction effect was incorporated into the analysis. Row C shows the results of the regression model incorporating the direct effects of the education level and CER, row D subsequently shows the results when this interaction effect was incorporated in the analysis. Consequently, the change statistics in row D reflect the changes from the regression model in row C.

Table 11: Regression analysis Production costs development (Education level)				
Dependent variable: Production costs development				
	b (SE)	b (SE)	b (SE)	b (SE)
Control variables	A	B	C	D
Size (Inverted)	-6.497 (5.120)	-5.963 (5.143)	-6.061 (5.197)	-6.056 (5.173)
Food industry	-0.243 (0.414)	-0.243 (0.414)	-0.209 (0.404)	-0.130 (0.405)
Textile industry	-0.321 (0.382)	0.343 (0.382)	-0.323 (0.382)	-0.287 (0.381)
Construction industry	-0.187 (0.444)	-0.211 (0.444)	-0.142 (0.441)	-0.162 (0.439)
Chemical industry	-0.461 (0.381)	-0.441 (0.382)	-0.446 (0.380)	-0.399 (0.380)
Machinery industry	-0.117 (0.364)	-0.112 (0.363)	-0.072 (0.361)	-0.109 (0.360)
Electronic industry	-0.086 (0.350)	-0.093 (0.350)	-0.057 (0.350)	-0.098 (0.350)
Firm Age	0.007 (0.004)*	0.006 (0.004)	0.007 (0.004)	0.006 (0.004)
Innovation intensity	-0.080 (0.031)**	-0.082 (0.031)***	-0.077 (0.028)***	-0.075 (0.028)***
Complex products	-0.012 (0.013)	-0.012 (0.013)	-0.013 (0.013)	-0.013 (0.013)
Simple products	-0.194 (0.258)	-0.205 (0.258)	-0.215 (0.260)	-0.250 (0.260)
Predictor variables				
Education level	-0.001 (0.008)	-0.001 (0.008)	0.000 (0.008)	-0.004 (0.009)
WPI	0.054 (0.074)	0.040 (0.075)	-	-
Education_centered * WPI_centered	-	-0.005 (0.005)	-	-
CER	-	-	0.050 (0.067)	0.021 (0.070)
Education_centered * CER_centered	-	-	-	-0.008 (0.005)
Model summary				
F-value	1.197	1.193	1.200	1.289
F-change	-	1.124	-	2.301
R^2	0.100	0.107	0.100	0.115
R^2 change	-	0.007	-	0.015
N	154	154	154	154
Significance levels:	*** p < ,1; ** p < ,05; *** p < ,01**			

The regression model incorporating the interaction between the education level and WPI had slightly better fit with the data (adj. $R^2 = 0.017$ $F(14, 139) = 1.193$, $p = 0.287$) than the model used in testing the hypotheses regarding production costs development (adj. $R^2=0.014$ $F(14, 139) = 1.158$, $p = 0.315$). The same holds true for the regression model which incorporated the interaction between CER and the education level (adj. $R^2 = 0.026$ $F(14, 139) = 1.289$, $p = 0.221$). Table 11 furthermore shows that the interaction between the education level and CER has no significant impact on the development of production costs $b = -0.008$ $t(139) = 1.517$, $p=0.132$ and neither does the interaction between the education level and WPI $b = -0.005$ $t(139) = -1.060$, $p=0.291$. The education level of the employees therefore seems to have no influence on the effects of CSR activities on the development of production costs. Using the realized potential of the variables produced similar results for the regression model incorporating the interaction between the education level and WPI, save for the fact that the realized potential of WPI was significant at the 90% confidence interval $b = 0.063$ $t(139) = 1.808$, $p=0.073$. The full regression results the regression analysis using the realized potential of WPI can be found in appendix F. The regression model incorporating the education level and the realized potential of CER suffered from the same extreme multicollinearity as described above. Consequently, no meaningful interpretation of this regression model, with regard to these variables, can be given.

Section 5: Discussion

In this section, this thesis discusses and interprets the results. It does this by firstly summarizing the key theoretical arguments supporting the hypotheses, the used methods in testing these hypotheses, and the results of this testing. Secondly, this thesis will answer the research question and reflect on this answer in light of the current theoretical understanding of CSR. Thirdly, this thesis will discuss its limatiations and possible new avenues for further research. This thesis will conclude with the managerial implications arising from the results of this thesis research.

Summary

This thesis has attempted to answer the following research question:

To what extent do CSR' social and environmental dimensions affect the corporate performance of manufacturing firms either similarly or differently, and to what extent does the combination of both dimensions generate additional performance effects for manufacturing firms?

In order to answer the research question, this thesis dissected the following two sub-questions from the research question:

How do CSR's social and environmental dimensions, both separately and combined, affect the development of turnover?

and

How do CSR's social and environmental dimensions, both separately and combined, affect the development of production costs?

In answering these sub-questions, and thus the research question, this thesis aimed to further the understanding in the business literature on how the specific dimensions of CSR, separately and combined, affect corporate performance by providing insight in how these dimensions and their interaction affect two different components of corporate performance: turnover and production costs. This thesis formulated a total of six hypotheses predicting how the environmental dimension, which was referred to as CER, and the social dimension, which was referred to as WPI, affected turnover and production costs. H1a predicted, based on stakeholder theory, that a higher number of CER activities would result in higher turnover development. H1b predicted, based on the notion of resource productivity and inherent environmental risk, that CER would have a curvilinear (inversed U-shape) effect on the development of production costs. H2a predicted that increased WPI would result in higher turnover development based on the resource-based view and social exchange theory. H2b predicted, based on the analogous application of the notion of resource productivity, that WPI reduces production costs. H3a predicted that the interaction between CER and WPI would result in increased turnover development as it would result in a less ambiguous reputation of being socially responsible. H3b predicted that the interaction between CER and WPI would result in a curvilinear (inversed U-shape) effect on the development of production costs due to the expected amplified environmental performance and organizational commitment.

This thesis employed a mono-method quantitative research design in testing the hypotheses. More specifically, data collected from 154 Dutch manufacturing firms in the 2015 version of the European Manufacturing Survey was analyzed through multiple regression analyses. The analyses found no statistical support for any of the hypothesized relationships. Subsequently, several post-hoc analyses were performed. The realized potential of the variables was incorporated as a validity check while regression models incorporating the customer type and education level were run to determine if these different regression models explain more variance result in significant relationships between the variables. However, almost all of the findings of these post-hoc analyses were also statistically non-significant with the exception of the post-hoc analysis using the realized potential of the variables. This post-hoc analysis showed a statistically significant positive relationship between WPI and the development of production costs at the 90% confidence interval. Consequently, the answers to the sub-questions of the research question appear to be that CER has no effect on either the development of turnover or the development of production costs and that WPI has no effect on the development of turnover but adversely, albeit at the 90% confidence interval, effects the development of production costs. There is furthermore no statistical proof that the combination of both dimensions affects corporate performance either positively or negatively.

Interpretation of the results

Hypotheses on CER

H1a posited that an increased number of CER activities would lead to increased turnover development. Multiple regression analysis, however, did not find a statistically significant relationship between CER and turnover development. This thesis hypothesized this positive relationship based on instrumental stakeholder theory and the assumption that increased CER activities would result in a "better" reputation regarding a firm's degree of socially responsibleness. However, the reputational effects of CER activities are not necessarily immediate and might take time to materialize. Rezende et al. (2019) have shown that the financial effects of green innovations are indeed conditional on time. They found that green innovations have the strongest effect on financial performance after two years (Rezende et al., 2019). While this thesis did account for certain delayed effects by measuring the development of turnover, it still was only able to account for any delay in a two-year period as the EMS' research period spans two years. Consequently, it is possible that the financial effects of CER did not yet fully materialize, thus explaining why no significant relationship between CER and turnover development was found.

Another explanation for the non-significant relationship between CER and turnover development could be that the assumed reputational effects did not materialize at all or are smaller than expected. This could happen for two reasons. Firstly, it is possible that stakeholders do not value CER activities. This explanation, however, seems unlikely for reasons explained in section 2. Secondly, and more likely, a possible explanation could be that the implementation of CER related technologies and concepts is not always visible to stakeholders. If stakeholders are not aware of a firm's CER activities, they cannot adjust their perceptions of the firm's degree of social responsibility. Consequently, this inhibits firms from enjoying any reputational benefits. This line of reasoning is supported by Pérez-Cornejo et al. (2019), who found that CSR reporting, which is actively reporting CSR activities to stakeholders, intensified the positive link between CSR activities and corporate reputation. The researchers explained this positive moderation effect through the increased credibility and visibility of the CSR activities (Pérez-Cornejo et al., 2019). As this thesis did not measure the quantity and quality of any CSR reporting, it is possible that CER activities were not visible (enough) to stakeholders, which (partially) negated their assumed reputational benefits, which in turn explains the non-significant relationship between CER and turnover development.

H1b predicted that CER activities would lower the development of production costs. Central to this reasoning was Porter and Van der Linde's (1995) argument that increased environmental performance leads to increased resource productivity as resources are used more efficiently, ultimately lowering production costs. However, no significant relationship between CER and the development of production costs was found. A possible explanation for the non-significancy of this relationship would be that the investments necessary for CER activities are, contrary to what was predicted in section 2, too costly for manufacturing firms to be (fully) won back. As stated in section 2, the costs of these investments are higher for manufacturing firms due to the inherent environmental risk of their type of activities. However, CER did not significantly increase the development of production costs either. This implies that firms do enjoy the benefits associated with increased resource productivity and that these benefits (partially) negate the high costs of these types of investments which ultimately results in a non-significant relationship between CER activities and the development of production costs. This could, for example, happen if CER activities decrease the energy and the amount of raw materials used by firms in their production process but that the costs of energy and the use raw materials do not necessarily constitute a large (enough) part of the overall production costs to cause a statistically significant decrease of the overall production costs.

Hypotheses on WPI

This thesis expected that WPI activities increased the level of the desirable KSAOs of a firm's workforce. More specifically, this thesis expected that WPI activities would increase this level through two effects of WPI activities: (1) increased attractiveness of a firm for potential job-seekers which eases the attraction of personnel with high levels of desirable KSAOs and (2) increased levels of desirable KSAOs of the current personnel due to the effect of WPI activities as either competence building or other effects hypothesized by SET. This thesis consequently hypothesized that these higher levels of KSAOs would increase the development of turnover and decrease the development of production costs. However, these hypothesized relationships were statistically non-significant. It is possible that the non-significancy of these findings can be due to the fact that WPI activities might not necessarily raise the levels of desirable KSAOs. If potential job-seekers are, for example, not aware of the WPI activities a firm undertakes, then they will not perceive that firm to be a more attractive potential employer. This line of reasoning is similar to the argument of the (in)visibility of CER activities made above. Put shortly: stakeholders need to be aware of undertaken CSR activities if firms want to enjoy the reputational benefits of these activities. Poor visibility of WPI activities might therefore explain why external stakeholders, that is, potential employees, do not necessarily perceive a firm to be a more attractive employer, which means that WPI does not necessarily ease the attraction of personnel with high levels of desirable KSAOs.

However, it is harder to imagine that current employees are not aware of the WPI activities of their firm due to their position as internal stakeholders. Additionally, the nature of the expected effect WPI activities have on the KSAOs of the existing personnel is different. This thesis expected that WPI activities have both competence-building effects and that WPI activities, as argued by SET, increase other types of desirable KSAOs. This thesis was not, however, able to see if either of these effects actually occurred. The EMS only asks if a firm employs certain technologies and concepts. It does not ask whether employees actually partake in any provided training or if the provided training is actually effective. Consequently, it is possible that a firm does provide training or other types of WPI activities aimed at competence building but that these activities do not have the intended effect of increasing the level of desirable KSAOs. Furthermore, the EMS also does not ask what the employees' perceptions of a firm's WPI activities are. This is problematic as SET's reasoning is based on an internal psychological process. As stated in section 2, SET argues that people generally feel the need to maintain balance in their reciprocal relationships. However, if and when that balance is achieved is up to the perception of the individual employees (Rousseau & Tijoriwala, 1998). Employees may take certain WPI activities, such as ensuring a safe work environment, for granted and thus do not feel the need to balance the scales at all. Likewise, it is possible that employees do not perceive WPI activities as (primarily) taken in their interest, which also lessens the perceived effort necessary to arrive at the reciprocal balance in the exchange relationship and thus likely lessening the development of desirable KSAOs.

In summarization, WPI activities do not necessarily increase the ease of recruiting new personnel with high levels of desirable KSAOs as potential job-seekers are not necessarily aware of the WPI activities a firm undertakes. Furthermore, WPI activities do not necessarily increase the level of desirable KSAOs of firm's current personnel as the competence building effects of these activities might be lacking and as current personnel might not feel the need (as strongly) to reciprocate the firm's WPI activities which also lessens the assumed increase of desirable KSAOs. Consequently, if undertaken WPI activities do not increase the level of desirable KSAOs, this might explain the non-significancy of the relationships between WPI and turnover and production costs development.

Hypotheses on the interaction effect

H3a hypothesized that the interaction between WPI and CER would increase the development of turnover as this interaction was expected to result in increased stakeholder benefits. As stated in section 2, these increased stakeholder benefits were expected because of two reasons. Firstly, the interaction between WPI and CER was assumed to result in increased environmental performance due to the competence-building effects of WPI and the increased attractiveness of a firm that combines both dimensions of CSR as an employer. Secondly, combining both dimensions of CSR was assumed to result in a “better” corporate reputation and thus less CSR skepticism. However, statistical analysis showed that the relationship between the interaction effect of CER and WPI was non-significant.

As has become clear from the discussion on the direct effects of CER and WPI, the assumptions underlying the effect of the interaction effect on turnover are not necessarily met. This thesis was not able to see if WPI activities actually resulted in increased competence, and neither was it able to assess if CER and WPI activities positively affected stakeholders’ perceptions of the firm. Consequently, it is possible that the assumed effects of the interaction effect did not occur, which can explain the non-significant relationship between the interaction effect and the development of turnover.

H3b hypothesized that the interaction effect would have a curvilinear effect (inversed U-shape) on the development of production costs. This hypothesis was based on the expectation that the combination of CER and WPI results in increased environmental performance and the expectation that CER and WPI result in shared values between employees and the firm, which has been shown to increase organizational commitment, which is a desirable KSAO. Multiple linear regression analysis, however, did not find any statistically significant relationship between the interaction effect of CER and WPI. The non-significancy of this relationship can be explained using similar reasoning used in explaining the non-significancy of the other hypothesized relationships. This thesis could not objectively determine the firms' environmental performance, and this thesis is consequently unable to determine if the combination of CER and WPI actually resulted in *increased* environmental performance. If the environmental performance did not increase, then the costs associated with improved environmental performance were not incurred thus (partially) explaining why the interaction effect did not significantly affect production costs. Furthermore, as stated above, this thesis was not able to determine if any provided training was effective or what such training exactly entailed. Consequently, it does not necessarily follow that the combination of WPI and CER results in increased environmental consciousness of the employees, which means that the expected overlap in values between the firm and its employees did not necessarily occur, which also (partially) explains the non-significancy of the relationship between the interaction effect and the development of production costs.

Other results

While this thesis did not find statistical support for its hypotheses, two other aspects of the result are worth discussing: the effect of innovation intensity and the effect of the realized potential of WPI.

In the original regression model, innovation intensity was found to significantly reduce the development of production costs. This finding is consistent with other studies that report that innovativeness results in better financial performance (Anderson et al., 2014; Bourdeau et al., 2020).

This finding contributes to the business literature by showing that innovation intensity increases financial performance through decreased production costs and that it does not, based on this dataset, affects turnover. This can be explained through the positive effects innovations generally have on the operational performance, that is, the efficiency of the internal processes of firms (Bourdeau et al., 2020), as increased efficiency typically lowers production costs.

In the post-hoc analysis using the realized potential, it became clear that the realized potential of WPI increased the production costs of firms at the 90% confidence interval. This thesis has given several possible explanations why WPI activities might not increase the KSAOs of the existing personnel nor ease the attraction of the new personnel with high level of desirable KSAOs. This line of reasoning also explains the adverse effect of the realized potential of WPI on the development of production costs at the 90% confidence interval. If undertaken WPI activities do not increase the level of desirable KSAOs (enough), then investments in these type of activities cannot be expected to yield a positive return. Consequently, if a firm invests a lot to implement WPI activities to a high(er) degree without ensuring that this increased implementation increases the effectiveness of these WPI activities, the negative monetary returns on these investments can be expected to increase accordingly, thus explaining the increase of production costs which correlates with the implementation of WPI activities.

Limitations

As with all studies, this thesis has suffered from several limitations. Its main limitation is inherent to the dataset: it was not possible to determine how the relevant stakeholders perceived the CSR activities of each firm. These perceptions, however, are likely to determine if, and the extent to which, firms enjoy the stakeholder and reputational benefits, which in turn were expected to affect the development of turnover and production costs. A second limitation was also inherent to the dataset and is concerned with the measurement of the development of the production costs. While this thesis treated this variable as continuous, respondents answered on predetermined answer categories. A more accurate measurement of the development of production costs might have improved the validity and reliability of the analyses on this variable. Furthermore, this thesis did not analyze the build-up of the production costs. It is possible that energy costs, for example, constitute a relatively larger part of the production costs for certain firms than it does for others. Consequently, if CER activities do indeed lead to increased environmental performance, it is not unthinkable that the effects of CER on the overall production costs differ across firms. The “if” in the last sentence was not coincidental as, constituting a third limitation, this thesis was unable to determine if the undertaken CSR activities were effective, that is if CER actually increased environmental performance and if WPI increased employee wellbeing and the level of desirable KSAOs in the firm. Fourthly, the research period of two years might, as explained above, have been too short to fully capture any delayed effects of the (environmental) CSR activities.

Avenues for further research

This thesis presented several explanations for why the hypothesized relationships were non-significant. Future research could focus on these explanations to see if they explain the hypothesized relationships' lack of significancy. More specifically, four recommendations for future research can be given. Firstly, future research should consider the perceptions that the relevant stakeholders have of the CSR activities that a firm undertakes to determine if lack of awareness of CSR activities negates the theorized stakeholder and reputational benefits. Secondly, researchers should research the effect of CSR activities over a more extended research period than two years to fully capture any delayed effects. Thirdly, researchers should try to determine what effects CSR activities have on the internal side of the organization as this allows researchers to determine if any assumed internal effects of CSR activities, for example, competence building or increased environmental performance, indeed occur. Building on this, it might be especially worthwhile for researchers to research any indirect effects CER activities might have on the production costs through the costs of energy and material usage.

Managerial implications

The results of this thesis also have managerial implications. Based on the results of this thesis, investing in CSR has no direct adverse or positive consequences for firms when assessed from a financial point of view. Consequently, it could be argued that there is no argument to be made against firms investing in CSR as this does not negatively affect their financial performance. However, money can only be spent once, and investments in CSR cannot, based on the results of this thesis, be expected to yield positive returns. Based on a strictly financial perspective, firms should therefore not invest in CSR activities to avoid incurring the opportunity costs of investing these funds in other projects that can be expected to either decrease production costs or increase turnover. This especially holds true for B2B firms as WPI activities increase their production costs. Furthermore, it is recommendable for firms to be innovative on other fields than the social and environmental dimension of CSR as innovation intensity has been shown to decrease the development of production costs.

Reference list

Alshehhi, A., Nobanee, H., & Khare, N. (2018). The Impact of Sustainability Practices on Corporate Financial Performance: Literature Trends and Future Research Potential. *Sustainability*, *10*(2), 494. https://doi.org/10.3390/su10020494

Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and Creativity in Organizations. *Journal of Management*, *40*(5), 1297–1333. https://doi.org/10.1177/0149206314527128

Bansal, P. (2005). Evolving sustainably: a longitudinal study of corporate sustainable development. *Strategic Management Journal*, *26*(3), 197–218. https://doi.org/10.1002/smj.441

Barauskaite, G., & Streimikiene, D. (2020). Corporate social responsibility and financial performance of companies: The puzzle of concepts, definitions and assessment methods. *Corporate Social Responsibility and Environmental Management*, *28*(1), 278–287. https://doi.org/10.1002/csr.2048

Barnea, A., & Rubin, A. (2010). Corporate Social Responsibility as a Conflict Between Shareholders. *Journal of Business Ethics*, *97*(1), 71–86. https://doi.org/10.1007/s10551-010-0496-z

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Baron, D. P., M. A. Harjoto and H. Jo. (2009) "The Economics and Politics of Corporate Social Performance." (Stanford University Graduate School of Business Research Paper No. 1993), Available: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1202390.

Behun, M., Gavurova, B., Tkacova, A., & Kotaskova, A. (2018). THE IMPACT OF THE MANUFACTURING INDUSTRY ON THE ECONOMIC CYCLE OF EUROPEAN UNION COUNTRIES. *Journal of Competitiveness*, *10*(1), 23–39. https://doi.org/10.7441/joc.2018.01.02

Berle, A. A. (1931). Corporate Powers as Powers in Trust. *Harvard Law Review*, *44*(7), 1049. https://doi.org/10.2307/1331341

Berrone, P. (2009). Green keys to unlock competitive advantage. *ISIE Insight, 2*, 50–57

Bourdeau, S., Aubert, B., & Bareil, C. (2020). The effects of IT use intensity and innovation culture on organizational performance: the mediating role of innovation intensity. *Management Research Review*, *44*(2), 359–380. https://doi.org/10.1108/mrr-02-2020-0068

Bourgeois, L. J. (1981). On the Measurement of Organizational Slack. *The Academy of Management Review*, *6*(1), 29. https://doi.org/10.2307/257138

Cai, Y., Jo, H., & Pan, C. (2011). Doing Well While Doing Bad? CSR in Controversial Industry Sectors. *Journal of Business Ethics*, *108*(4), 467–480. https://doi.org/10.1007/s10551-011-1103-7

Campbell, M. C., & Kirmani, A. (2000). Consumers’ Use of Persuasion Knowledge: The Effects of Accessibility and Cognitive Capacity on Perceptions of an Influence Agent. *Journal of Consumer Research*, *27*(1), 69–83. https://doi.org/10.1086/314309

Carroll, A. (2008). A History of Corporate Social Responsibility: Concepts and Practices. In A. Crane (Eds.), *The Oxford Handbook of Corporate Social Responsibility* (pp. 19-42). Oxford, United Kingdom: Oxford University Press.

Chang, C. H. (2011). The Influence of Corporate Environmental Ethics on Competitive Advantage: The Mediation Role of Green Innovation. *Journal of Business Ethics*, *104*(3), 361–370. https://doi.org/10.1007/s10551-011-0914-x

Collins, C. J. (2020). Expanding the resource based view model of strategic human resource management. *The International Journal of Human Resource Management*, *32*(2), 331–358. https://doi.org/10.1080/09585192.2019.1711442

Connors, S., Anderson-MacDonald, S., & Thomson, M. (2017). Overcoming the 'Window Dressing' Effect: Mitigating the Negative Effects of Inherent Skepticism Towards Corporate Social Responsibility. *Journal of Business Ethics*, *145*(3), 599–621. https://doi.org/10.1007/s10551-015-2858-z

Cornelissen, J. P. (2017). Preserving Theoretical Divergence in Management Research: Why the Explanatory Potential of Qualitative Research Should Be Harnessed Rather than Suppressed. *Journal of Management Studies*, *54*(3), 368–383. https://doi.org/10.1111/joms.12210

Crifo, P., Diaye, M.-A., & Pekovic, S. (2016). CSR related management practices and firm performance: An empirical analysis of the quantity–quality trade-off on French data. *International Journal of Production Economics*, *171*, 405–416. https://doi.org/10.1016/j.ijpe.2014.12.019

Dachs, B., Borowiecki, M., Kinkel, S,. Schmall, T. C. (2012). The offshoring of Production Activities in European Manufacturing. Retrieved from https://mpra.ub.uni-muenchen.de/42973/

Daszynska-Zygadlo, K., Slonski, T., & Zawadzki, B. (2016). The market value of CSR performance across sectors. *Engineering Economics*, *27*(2). https://doi.org/10.5755/j01.ee.27.2.13480

de Burgos-Jiménez, J., Vázquez-Brust, D., Plaza-Úbeda, J. A., & Dijkshoorn, J. (2013). Environmental protection and financial performance: an empirical analysis in Wales. *International Journal of Operations & Production Management*, *33*(8), 981–1018. https://doi.org/10.1108/ijopm-11-2010-0374

Dhondt, S. (Ed.) (2012). *European learning network for workplace innovation*, Section 4 technical proposal, call for tender no 212/pp/ent/cip/12/c/n02c04. Hoofddorp: TNO.

Dodd, E. M. (1932). For Whom Are Corporate Managers Trustees? *Harvard Law Review*, *45*(7), 1145. https://doi.org/10.2307/1331697

Donaldson, T., & Preston, L. E. (1995). The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications. *The Academy of Management Review*, *20*(1), 65. https://doi.org/10.2307/258887

Egger, H., Kreickemeier, U., & Wrona, J. (2015). Offshoring domestic jobs. *Journal of International Economics*, *97*(1), 112–125. https://doi.org/10.1016/j.jinteco.2015.03.010

Eisenhardt, K. M. (1989). Agency Theory: An Assessment and Review. *The Academy of Management Review*, *14*(1), 57. https://doi.org/10.2307/258191

European Commission. (2011). *A renewed EU strategy 2011-14 for Corporate Social Responsibility*. Geraadpleegd van https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0681&from=EN

European Commission. (2013a). *HOW COMPANIES INFLUENCE OUR SOCIETY: CITIZIN'S VIEW* (FLASH EUROBAROMETR 363). Retrieved from https://ec.europa.eu/commfrontoffice/publicopinion/flash/fl_363_en.pdf

Fraunhofer Institute for Systems and Innovation. (z.d.). *European Manufacturing Survey*. Geraadpleegd op 26 maart 2021, van https://www.isi.fraunhofer.de/en/themen/industrielle-wettbewerbsfaehigkeit/fems.html

Friedman, A. L., & Miles, S. (2006). *Stakeholders : Theory and practice*. ProQuest Ebook Central https://ebookcentral-proquest-com.ru.idm.oclc.org

Friedman, M. (1970, 13 september). *A Friedman doctrine-- The Social Responsibility Of Business Is to Increase Its Profits*. Retrieved from https://www.nytimes.com/1970/09/13/archives/a-friedman-doctrine-the-social-responsibility-of-business-is-to.html

Geiger, S., & Cashen, L. (2002). A Multidimensional Examination Of Slack And Its Impact On Innovation. *Journal of Managerial Issues, 14*(1), 68-84. Retrieved June 7, 2021, from http://www.jstor.org/stable/40604374

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis* (8th edition). Hampshire, United Kingdom: Cengage Learning.

Hoepner, Andreas G. F. and Yu, Pei-Shan, Corporate Social Responsibility Across Industries: When Can Who Do Well by Doing Good? (March 1, 2010). Available at SSRN: https://ssrn.com/abstract=1284703 or http://dx.doi.org/10.2139/ssrn.1284703

Ingarao, G. (2017). Manufacturing strategies for efficiency in energy and resources use: The role of metal shaping processes. *Journal of Cleaner Production*, *142*, 2872–2886. https://doi.org/10.1016/j.jclepro.2016.10.182

Jiménez-Jiménez, D., & Sanz-Valle, R. (2011). Innovation, organizational learning, and performance. *Journal of Business Research*, *64*(4), 408–417. https://doi.org/10.1016/j.jbusres.2010.09.010

Jones, T. M., Harrison, J. S., & Felps, W. (2018). How Applying Instrumental Stakeholder Theory Can Provide Sustainable Competitive Advantage. *Academy of Management Review*, *43*(3), 371–391. https://doi.org/10.5465/amr.2016.0111

Kachaner, N., Nielsen, J., Portafaix, A., & Rodzko, F. (2021, 28 april). *The Pandemic Is Heightening Environmental Awareness*. Geraadpleegd van https://www.bcg.com/publications/2020/pandemic-is-heightening-environmental-awareness

Kao, E. H., Yeh, C.-C., Wang, L.-H., & Fung, H.-G. (2018). The relationship between CSR and performance: Evidence in China. *Pacific-Basin Finance Journal*, *51*, 155–170. https://doi.org/10.1016/j.pacfin.2018.04.006

Kehoe, R. R., & Collins, C. J. (2017). Human resource management and unit performance in knowledge-intensive work. *Journal of Applied Psychology*, *102*(8), 1222–1236. https://doi.org/10.1037/apl0000216

Kehoe, R. R., & Wright, P. M. (2013). The impact of high-performance human resource practices on employees' attitudes and behaviors. *Journal of Management, 39*(2), 366–391. https://doi.org/10.1177/0149206310365901

Kessler, E. H. (2013). *Encyclopedia of Management Theory*. Thousand Oaks, Canada: SAGE Publications.

Konar, S., & Cohen, M. A. (2001). Does the Market Value Environmental Performance? *Review of Economics and Statistics*, *83*(2), 281–289. https://doi.org/10.1162/00346530151143815

KRISTOF-BROWN, A. L. (2000). PERCEIVED APPLICANT FIT: DISTINGUISHING BETWEEN RECRUITERS' PERCEPTIONS OF PERSON-JOB AND PERSON-ORGANIZATION FIT. *Personnel Psychology*, *53*(3), 643–671. https://doi.org/10.1111/j.1744-6570.2000.tb00217.x

Lacity, M., & Rudramuniyaiah, P. S. (2009). Funny Business: Public Opinion of Outsourcing and Offshoring as Reflected in U.S. and Indian Political Cartoons. *Communications of the Association for Information Systems*, *24*, 199–224. https://doi.org/10.17705/1cais.02413

Lii, Y. S., & Lee, M. (2012). Doing Right Leads to Doing Well: When the Type of CSR and Reputation Interact to Affect Consumer Evaluations of the Firm. *Journal of Business Ethics*, *105*(1), 69–81. https://doi.org/10.1007/s10551-011-0948-0

Malik, M. (2015). Value-Enhancing Capabilities of CSR: A Brief Review of Contemporary Literature. *Journal of Business Ethics*, *127*(2), 419–438. https://doi.org/10.1007/s10551-014-2051-9

Manresa, A., Bikfalvi, A., & Simon, A. (2019). The impact of training and development practices on innovation and financial performance. *Industrial and Commercial Training*, *51*(7/8), 421–444. https://doi.org/10.1108/ict-04-2019-0035

Masulis, R. W., & Reza, S. W. (2014). Agency Problems of Corporate Philanthropy. *Review of Financial Studies*, *28*(2), 592–636. https://doi.org/10.1093/rfs/hhu082

Mathieu, J. E., & Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological Bulletin*, *108*(2), 171–194. https://doi.org/10.1037/0033-2909.108.2.171

NRC. (2019, 15 March). Scholieren wereldwijd de straat op voor het klimaat. *NRC*. Geraadpleegd van https://www.nrc.nl

Open Letter, 2015. *Open letter from CEOs to world leaders urging climate action.* Retrieved from: https://europa.eu/capacity4dev/file/29155/download?token=ndlZH5vF

Pan, X., Sinha, P., & Chen, X. (2021). Corporate social responsibility and eco-innovation: The triple bottom line perspective. *Corporate Social Responsibility and Environmental Management*, *28*(1), 214–228. https://doi.org/10.1002/csr.2043

Partalidou, X., Zafeiriou, E., Giannarakis, G., & Sariannidis, N. (2020). The effect of corporate social responsibility performance on financial performance: the case of food industry. *Benchmarking: An International Journal*, *27*(10), 2701–2720. https://doi.org/10.1108/bij-11-2019-0501

Pfister, M. (2020). Corporate Social Responsibility and Organizational Attraction: A Systematic Literature Review. *American Journal of Management*, *20*(2), 96–111. https://doi.org/10.33423/ajm.v20i2.3002

Pham, N. T., Tučková, Z., & Phan, Q. P. T. (2019). Greening human resource management and employee commitment toward the environment: An interaction model. *Journal of Business Economics and Management*, *20*(3), 446-465. https://doi.org/10.3846/jbem.2019.9659

Pinzone, M., Guerci, M., Lettieri, E., & Redman, T. (2016). Progressing in the change journey towards sustainability in healthcare: the role of 'Green' HRM. *Journal of Cleaner Production*, *122*, 201–211. https://doi.org/10.1016/j.jclepro.2016.02.031

Ployhart, R. E., Nyberg, A. J., Reilly, G., & Maltarich, M. A. (2014). Human Capital Is Dead; Long Live Human Capital Resources! *Journal of Management*, *40*(2), 371–398. https://doi.org/10.1177/0149206313512152

Porter, M. E., & Linde, C. V. D. (1995). Toward a New Conception of the Environment-Competitiveness Relationship. *Journal of Economic Perspectives*, *9*(4), 97–118. https://doi.org/10.1257/jep.9.4.97

Porter, M. E., & Kramer, M.R. (2006). "Strategy and Society: The Link between Competitive Advantage and Corporate Social Responsibility." *Harvard Business Review* 84, no. 12 (December 2006): 78–92.

Pot, F.D. (2017). Workplace Innovation and Well-being at Work. In P. Oeij, D.Rus & F.D. Pot (Eds.), *Workplace Innovation: Theory, Research and Practice. Volume in Series: Aligning Perspectives on Health, Safety and Well-Being,* Springer International Publishing. DOI:10.1007/978-3-319-56333-6

Prus, I., Nacamulli, R. C., & Lazazzara, A. (2017). Disentangling workplace innovation: a systematic literature review. *Personnel Review*, *46*(7), 1254–1279. https://doi.org/10.1108/pr-10-2016-0267

Rim, H., & Kim, S. (2016). Dimensions of corporate social responsibility (CSR) skepticism and their impacts on public evaluations toward CSR. *Journal of Public Relations Research*, *28*(5–6), 248–267. https://doi.org/10.1080/1062726x.2016.1261702

Rodriguez-Melo, A., & Mansouri, S. A. (2011). Stakeholder Engagement: Defining Strategic Advantage for Sustainable Construction. *Business Strategy and the Environment*, *20*(8), 539–552. https://doi.org/10.1002/bse.715

Rooijmans, T. (2019). *The influence of green innovations on economic performance.* (Master thesis). Retrieved from https://theses.ubn.ru.nl/bitstream/handle/123456789/8948/Rooijmans%2c_Twan_1.pdf?sequence=1

Rousseau, D. M., & Tijoriwala, S. A. (1998). Assessing psychological contracts: issues, alternatives and measures. *Journal of Organizational Behavior*, *19*(S1), 679–695. Retrieved from https://onlinelibrary.wiley.com/doi/10.1002/(SICI)1099-1379(1998)19:1+%3C679::AID-JOB971%3E3.0.CO;2-N

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research Methods for Business Students* (8th edition). Harlow, United Kingdom: Pearson Education Limited.

Semenova, N., & Hassel, L. G. (2008). Industry Risk Moderates the Relation between Environmental and Financial Performance. *Sustainable Investment Research Platform Working Papers*, 08–02.

Skarmeas, D., & Leonidou, C. N. (2013). When consumers doubt, Watch out! The role of CSR skepticism. *Journal of Business Research*, *66*(10), 1831–1838. https://doi.org/10.1016/j.jbusres.2013.02.004

Sharfman, M. P., Wolf, G., Chase, R. B., & Tansik, D. A. (1988). Antecedents of Organizational Slack. *Academy of Management Review*, *13*(4), 601–614. https://doi.org/10.5465/amr.1988.4307484

Soana, M.-G. (2011). The Relationship Between Corporate Social Performance and Corporate Financial Performance in the Banking Sector. *Journal of Business Ethics*, *104*(1), 133–148. https://doi.org/10.1007/s10551-011-0894-x

Stuebs, M., & Sun, L. (2010). Business Reputation and Labor Efficiency, Productivity, and Cost. *Journal of Business Ethics*, *96*(2), 265–283. https://doi.org/10.1007/s10551-010-0464-7

Su, R., Liu, C., & Teng, W. (2020). THE HETEROGENEOUS EFFECTS OF CSR DIMENSIONS ON FINANCIAL PERFORMANCE – A NEW APPROACH FOR CSR MEASUREMENT. *Journal of Business Economics and Management*, *21*(4), 987–1009. https://doi.org/10.3846/jbem.2020.12394

Su, R., Liu, C., & Teng, W. (2020). THE HETEROGENEOUS EFFECTS OF CSR DIMENSIONS ON FINANCIAL PERFORMANCE – A NEW APPROACH FOR CSR MEASUREMENT. *Journal of Business Economics and Management*, *21*(4), 987–1009. https://doi.org/10.3846/jbem.2020.12394

Sutton, R. I., & Staw, B. M. (1995). What Theory is Not. *Administrative Science Quarterly*, *40*(3), 371. https://doi.org/10.2307/2393788

Tabachnick, B. G., & Fidell, L. S. (1996). Using Multivariate Statistics (3rd ed.). New York: Harper Collins.

Torugsa, N. A., O'Donohue, W., & Hecker, R. (2012). Proactive CSR: An Empirical Analysis of the Role of its Economic, Social and Environmental Dimensions on the Association between Capabilities and Performance. *Journal of Business Ethics*, *115*(2), 383–402. https://doi.org/10.1007/s10551-012-1405-4

Walley, N. and Whitehead, B. (1994), "*It's not easy being green*", *Harvard Business Review*, Vol. 72 No. 3, pp. 2-7.

Weng, H. H., Chen, J. S., & Chen, P. C. (2015). Effects of Green Innovation on Environmental and Corporate Performance: A Stakeholder Perspective. *Sustainability*, *7*(5), 4997–5026. https://doi.org/10.3390/su7054997

Winter, J. W., De Jongh, J. M., Heijink, J. B. S., Timmerman, L., Van Solinge, G., Lennarts, M. L., . . . Rensen, G. J. C. (2020). Naar een zorgplicht voor bestuurders en commissarissen tot verantwoordelijke deelname aan het maatschappelijk verkeer. *Ondernemingsrecht*, *2020*(86), 471–474.

Wright, T. A., & Bonett, D. G. (2002). The moderating effects of employee tenure on the relation between organizational commitment and job performance: A meta-analysis. *Journal of Applied Psychology*, *87*(6), 1183–1190. https://doi.org/10.1037/0021-9010.87.6.1183

Xu, J., Wei, J., & Lu, L. (2019). Strategic stakeholder management, environmental corporate social responsibility engagement, and financial performance of stigmatized firms derived from Chinese special environmental policy. *Business Strategy and the Environment*, *28*(6), 1027–1044. https://doi.org/10.1002/bse.2299

Zoghi, C., Mohr, R. D., & Meyer, P. B. (2010). Workplace organization and innovation. *Canadian Journal of Economics*, *43*(2), 622–639. https://doi.org/10.1111/j.1540-5982.2010.01586.x

Appendix A: Distribution categorical values

Statistics

		Food_Industry	Textile_Industry	Construction_Industry	Chemical_Industry	Machinery_Industry	Electronic_Industry	simple products Batch or lot size characteristics dmain product or line of products	complex products Batch or lot size characteristics dmain product or line of products
N	Valid	154	154	154	154	154	154	154	154
	Missing	0	0	0	0	0	0	0	0
Mode		,00	,00	,00	,00	,00	,00	,00	,00

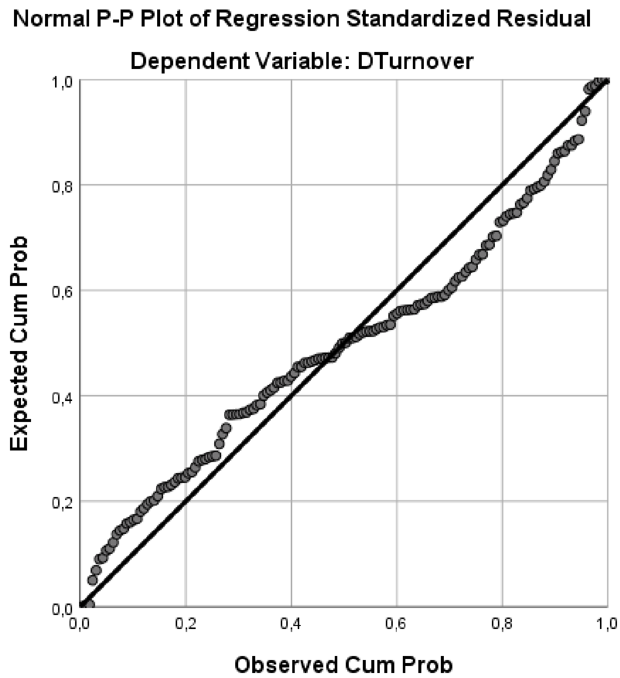
Industry frequencies						
Industry	Food	Textile	Construction	Chemical	Machinery	Electronic
N	16	20	12	19	28	27

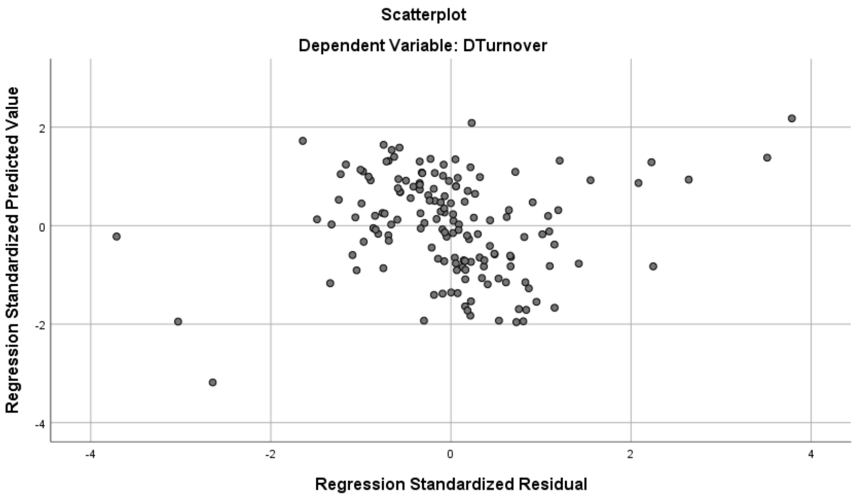
Appendix B: Regression coefficients, plots and HC consistent standard errors for turnover development

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	11,746	10,858		1,082	,281		
	Food_Industry	7,485	9,395	,075	,797	,427	,725	1,379
	Textile_Industry	-12,911	8,881	-,143	-1,454	,148	,669	1,496
	Construction_Industry	-8,241	10,422	-,073	-,791	,430	,764	1,310
	Chemical_Industry	11,077	8,944	,120	1,239	,218	,689	1,452
	Machinery_Industry	-2,399	8,114	-,030	-,296	,768	,608	1,644
	Electronic_Industry	8,482	8,062	,106	1,052	,295	,634	1,577
	SizeINV	-12,621	120,323	-,010	-,105	,917	,723	1,382
	Firm_Age	-,106	,095	-,093	-1,123	,263	,930	1,075
	simple products Batch or lot size characteristics dmain product or line of products	-,408	6,030	-,006	-,068	,946	,839	1,192
	complex products Batch or lot size characteristics dmain product or line of products	,085	,314	,022	,271	,787	,949	1,054
	Innovation_Intensity	,371	,595	,058	,623	,534	,739	1,354
2	(Constant)	13,626	11,256		1,211	,228		
	Food_Industry	9,361	9,847	,094	,951	,343	,667	1,499
	Textile_Industry	-11,881	9,090	-,131	-1,307	,193	,645	1,550
	Construction_Industry	-7,447	10,562	-,066	-,705	,482	,751	1,331
	Chemical_Industry	11,667	9,033	,126	1,292	,199	,682	1,465
	Machinery_Industry	-1,642	8,282	-,021	-,198	,843	,590	1,694
	Electronic_Industry	8,640	8,154	,108	1,060	,291	,627	1,596
	SizeINV	-21,917	123,540	-,017	-,177	,859	,694	1,442
	Firm_Age	-,117	,097	-,103	-1,209	,229	,890	1,123
	simple products Batch or lot size characteristics dmain product or line of products	-,157	6,141	-,002	-,025	,980	,818	1,223
	complex products Batch or lot size characteristics dmain product or line of products	,067	,317	,018	,212	,833	,939	1,065
	Innovation_Intensity	,687	,776	,108	,885	,378	,439	2,276
	WPI	-1,160	1,772	-,073	-,654	,514	,525	1,906
	CER	-,208	1,605	-,013	-,129	,897	,612	1,634
3	(Constant)	12,059	11,366		1,061	,291		
	Food_Industry	9,150	9,850	,092	,929	,354	,667	1,499
	Textile_Industry	-12,166	9,095	-,134	-1,338	,183	,644	1,552
	Construction_Industry	-7,207	10,565	-,063	-,682	,496	,751	1,331
	Chemical_Industry	10,779	9,078	,116	1,187	,237	,676	1,480
	Machinery_Industry	-1,315	8,288	-,017	-,159	,874	,589	1,697
	Electronic_Industry	9,100	8,167	,114	1,114	,267	,625	1,601
	SizeINV	-8,126	124,320	-,006	-,065	,948	,685	1,460
	Firm_Age	-,115	,097	-,101	-1,180	,240	,890	1,124
	simple products Batch or lot size characteristics dmain product or line of products	,267	6,156	,004	,043	,966	,814	1,229
	complex products Batch or lot size characteristics dmain product or line of products	,080	,318	,021	,251	,802	,938	1,066
	Innovation_Intensity	,770	,781	,121	,986	,326	,434	2,302
	WPI	-1,178	1,773	-,074	-,665	,507	,525	1,906
	CER	,313	1,688	,020	,185	,853	,553	1,807
	Interaction_Centered	-,583	,586	-,089	-,995	,321	,812	1,232

a. Dependent Variable: DTurnover






```
HC consistent standard errors:

Run MATRIX procedure:

HC Method
 3

Criterion Variable
 DTurnove

Model Fit:
       R-sq            F         df1         df2           p
```

,0963	,7542	14,0000	139,0000	,7164

Heteroscedasticity-Consistent Regression Results

<table>
<tr><th></th><th>Coeff</th><th>SE(HC)</th><th>t</th><th>P>|t|</th></tr>
<tr><td>Constant</td><td>12,0595</td><td>11,6920</td><td>1,0314</td><td>,3041</td></tr>
<tr><td>Food_Ind</td><td>9,1504</td><td>8,3055</td><td>1,1017</td><td>,2725</td></tr>
<tr><td>Textile_</td><td>-12,1656</td><td>9,8396</td><td>-1,2364</td><td>,2184</td></tr>
<tr><td>Construc</td><td>-7,2071</td><td>8,4918</td><td>-,8487</td><td>,3975</td></tr>
<tr><td>Chemical</td><td>10,7786</td><td>10,1551</td><td>1,0614</td><td>,2903</td></tr>
<tr><td>Machiner</td><td>-1,3151</td><td>8,5271</td><td>-,1542</td><td>,8777</td></tr>
<tr><td>Electron</td><td>9,0997</td><td>8,6010</td><td>1,0580</td><td>,2919</td></tr>
<tr><td>WPI</td><td>-1,1782</td><td>1,8364</td><td>-,6416</td><td>,5222</td></tr>
<tr><td>CER</td><td>,3127</td><td>1,7817</td><td>,1755</td><td>,8609</td></tr>
<tr><td>Innovati</td><td>,7700</td><td>,8562</td><td>,8993</td><td>,3701</td></tr>
<tr><td>Firm_Age</td><td>-,1147</td><td>,1188</td><td>-,9659</td><td>,3358</td></tr>
<tr><td>v21d1</td><td>,2667</td><td>9,8630</td><td>,0270</td><td>,9785</td></tr>
<tr><td>v21d3</td><td>,0797</td><td>24,4370</td><td>,0033</td><td>,9974</td></tr>
<tr><td>SizeINV</td><td>-8,1260</td><td>141,5898</td><td>-,0574</td><td>,9543</td></tr>
<tr><td>Interact</td><td>-,5832</td><td>,5741</td><td>-1,0158</td><td>,3115</td></tr>
</table>

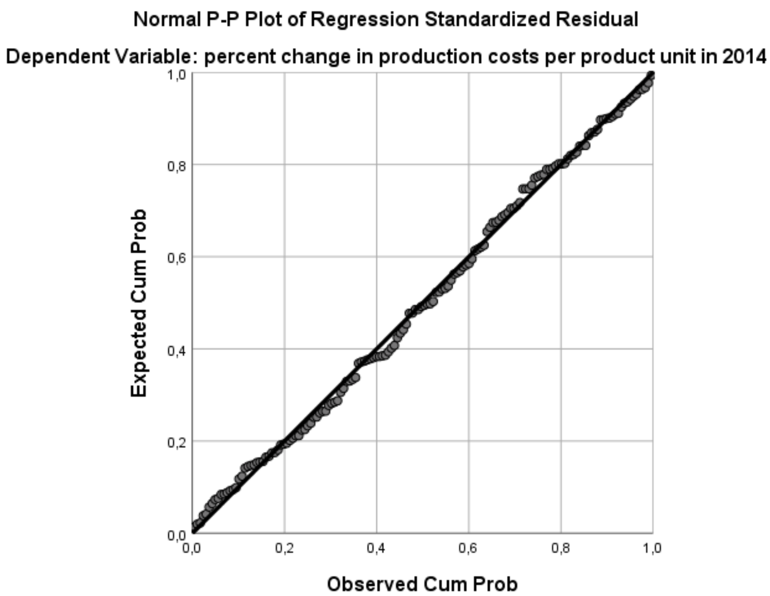
------ END MATRIX -----

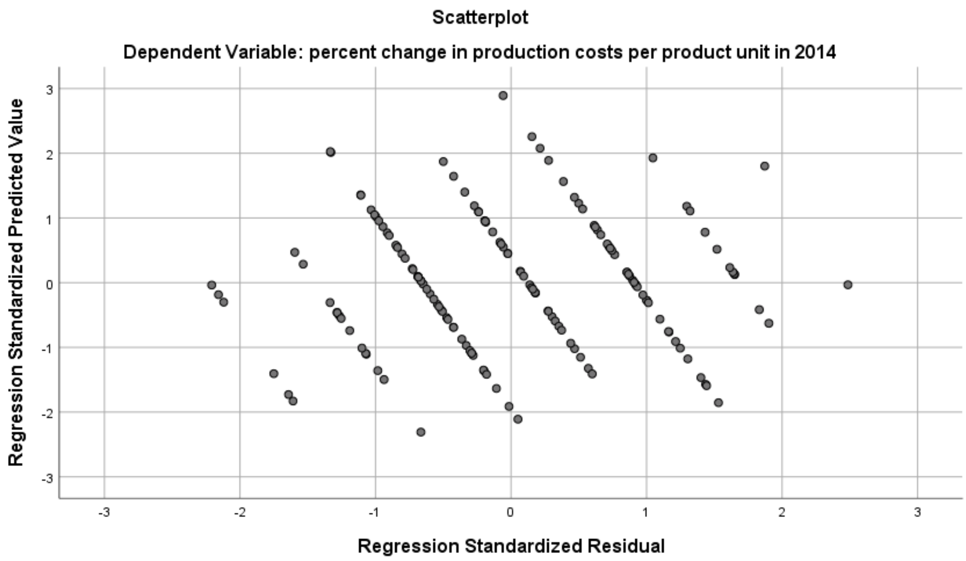
Appendix C: Coefficients and plots Production costs

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	11,746	10,858		1,082	,281		
	Food_Industry	7,485	9,395	,075	,797	,427	,725	1,379
	Textile_Industry	-12,911	8,881	-,143	-1,454	,148	,669	1,496
	Construction_Industry	-8,241	10,422	-,073	-,791	,430	,764	1,310
	Chemical_Industry	11,077	8,944	,120	1,239	,218	,689	1,452
	Machinery_Industry	-2,399	8,114	-,030	-,296	,768	,608	1,644
	Electronic_Industry	8,482	8,062	,106	1,052	,295	,634	1,577
	SizeINV	-12,621	120,323	-,010	-,105	,917	,723	1,382
	Firm_Age	-,106	,095	-,093	-1,123	,263	,930	1,075
	simple products Batch or lot size characteristics dmain product or line of products	-,408	6,030	-,006	-,068	,946	,839	1,192
	complex products Batch or lot size characteristics dmain product or line of products	,085	,314	,022	,271	,787	,949	1,054
	Innovation_Intensity	,371	,595	,058	,623	,534	,739	1,354
2	(Constant)	13,626	11,256		1,211	,228		
	Food_Industry	9,361	9,847	,094	,951	,343	,667	1,499
	Textile_Industry	-11,881	9,090	-,131	-1,307	,193	,645	1,550
	Construction_Industry	-7,447	10,562	-,066	-,705	,482	,751	1,331
	Chemical_Industry	11,667	9,033	,126	1,292	,199	,682	1,465
	Machinery_Industry	-1,642	8,282	-,021	-,198	,843	,590	1,694
	Electronic_Industry	8,640	8,154	,108	1,060	,291	,627	1,596
	SizeINV	-21,917	123,540	-,017	-,177	,859	,694	1,442
	Firm_Age	-,117	,097	-,103	-1,209	,229	,890	1,123
	simple products Batch or lot size characteristics dmain product or line of products	-,157	6,141	-,002	-,025	,980	,818	1,223
	complex products Batch or lot size characteristics dmain product or line of products	,067	,317	,018	,212	,833	,939	1,065
	Innovation_Intensity	,687	,776	,108	,885	,378	,439	2,276
	WPI	-1,160	1,772	-,073	-,654	,514	,525	1,906
	CER	-,208	1,605	-,013	-,129	,897	,612	1,634
3	(Constant)	12,059	11,366		1,061	,291		
	Food_Industry	9,150	9,850	,092	,929	,354	,667	1,499
	Textile_Industry	-12,166	9,095	-,134	-1,338	,183	,644	1,552
	Construction_Industry	-7,207	10,565	-,063	-,682	,496	,751	1,331
	Chemical_Industry	10,779	9,078	,116	1,187	,237	,676	1,480
	Machinery_Industry	-1,315	8,288	-,017	-,159	,874	,589	1,697
	Electronic_Industry	9,100	8,167	,114	1,114	,267	,625	1,601
	SizeINV	-8,126	124,320	-,006	-,065	,948	,685	1,460
	Firm_Age	-,115	,097	-,101	-1,180	,240	,890	1,124
	simple products Batch or lot size characteristics dmain product or line of products	,267	6,156	,004	,043	,966	,814	1,229
	complex products Batch or lot size characteristics dmain product or line of products	,080	,318	,021	,251	,802	,938	1,066
	Innovation_Intensity	,770	,781	,121	,986	,326	,434	2,302
	WPI	-1,178	1,773	-,074	-,665	,507	,525	1,906
	CER	,313	1,688	,020	,185	,853	,553	1,807
	Interaction_Centered	-,583	,586	-,089	-,995	,321	,812	1,232

a. Dependent Variable: DTurnover


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: percent change in production costs per product unit in 2014
Expected Cum Prob
Observed Cum Prob
0,0
0,2
0,4
0,6
0,8
1,0


Scatterplot
Dependent Variable: percent change in production costs per product unit in 2014
Regression Standardized Predicted Value
Regression Standardized Residual
-3
-2
-1
0
1
2
3

Appendix D: coefficients post-hoc customer type and turnover: realized potential

Model incorporating the realized potential of WPI:

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	11,746	10,858		1,082	,281		
	Food_Industry	7,485	9,395	,075	,797	,427	,725	1,379
	Textile_Industry	-12,911	8,881	-,143	-1,454	,148	,669	1,496
	Construction_Industry	-8,241	10,422	-,073	-,791	,430	,764	1,310
	Chemical_Industry	11,077	8,944	,120	1,239	,218	,689	1,452
	Machinery_Industry	-2,399	8,114	-,030	-,296	,768	,608	1,644
	Electronic_Industry	8,482	8,062	,106	1,052	,295	,634	1,577
	SizeINV	-12,621	120,323	-,010	-,105	,917	,723	1,382
	Innovation_Intensity	,371	,595	,058	,623	,534	,739	1,354
	simple products Batch or lot size characteristics dmain product or line of products	-,408	6,030	-,006	-,068	,946	,839	1,192
	complex products Batch or lot size characteristics dmain product or line of products	,085	,314	,022	,271	,787	,949	1,054
	Firm_Age	-,106	,095	-,093	-1,123	,263	,930	1,075
2	(Constant)	11,866	11,077		1,071	,286		
	Food_Industry	6,571	10,079	,066	,652	,515	,637	1,570
	Textile_Industry	-13,193	9,170	-,146	-1,439	,152	,634	1,577
	Construction_Industry	-8,108	10,515	-,071	-,771	,442	,758	1,319
	Chemical_Industry	10,615	9,077	,115	1,170	,244	,676	1,479
	Machinery_Industry	-1,742	8,286	-,022	-,210	,834	,590	1,695
	Electronic_Industry	8,346	8,121	,104	1,028	,306	,632	1,583
	SizeINV	-16,503	121,153	-,013	-,136	,892	,721	1,386
	Innovation_Intensity	,524	,722	,082	,726	,469	,509	1,966
	simple products Batch or lot size characteristics dmain product or line of products	-,527	6,066	-,008	-,087	,931	,838	1,193
	complex products Batch or lot size characteristics dmain product or line of products	,076	,317	,020	,240	,811	,945	1,058
	Firm_Age	-,109	,096	-,096	-1,126	,262	,904	1,107
	Producer of finished goods for consumers	4,138	7,608	,048	,544	,587	,850	1,176
	WPIRP	-,279	,836	-,036	-,334	,739	,566	1,767
3	(Constant)	21,857	18,165		1,203	,231		
	Food_Industry	6,616	10,098	,066	,655	,513	,637	1,570
	Textile_Industry	-13,227	9,187	-,146	-1,440	,152	,634	1,577
	Construction_Industry	-8,206	10,536	-,072	-,779	,437	,758	1,319
	Chemical_Industry	10,242	9,109	,111	1,124	,263	,674	1,484
	Machinery_Industry	-1,599	8,304	-,020	-,193	,848	,589	1,696
	Electronic_Industry	8,608	8,145	,108	1,057	,292	,630	1,586
	SizeINV	-15,883	121,381	-,012	-,131	,896	,721	1,386
	Innovation_Intensity	,522	,723	,082	,722	,471	,509	1,966
	simple products Batch or lot size characteristics dmain product or line of products	-,464	6,078	-,007	-,076	,939	,838	1,193
	complex products Batch or lot size characteristics dmain product or line of products	,074	,317	,019	,233	,816	,945	1,059
	Firm_Age	-,106	,097	-,094	-1,100	,273	,902	1,108
	Producer of finished goods for consumers	5,087	7,743	,058	,657	,512	,824	1,214
	WPIRP	-1,877	2,448	-,241	-,767	,444	,066	15,083
	WPIRP_int_customertype	1,451	2,089	,214	,695	,488	,069	14,515

a. Dependent Variable: DTurnover

Model incorporating the realized potential of CER:

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	11,746	10,858		1,082	,281		
	Food_Industry	7,485	9,395	,075	,797	,427	,725	1,379
	Textile_Industry	-12,911	8,881	-,143	-1,454	,148	,669	1,496
	Construction_Industry	-8,241	10,422	-,073	-,791	,430	,764	1,310
	Chemical_Industry	11,077	8,944	,120	1,239	,218	,689	1,452
	Machinery_Industry	-2,399	8,114	-,030	-,296	,768	,608	1,644
	Electronic_Industry	8,482	8,062	,106	1,052	,295	,634	1,577
	SizeINV	-12,621	120,323	-,010	-,105	,917	,723	1,382
	Innovation_Intensity	,371	,595	,058	,623	,534	,739	1,354
	simple products Batch or lot size characteristics dmain product or line of products	-,408	6,030	-,006	-,068	,946	,839	1,192
	complex products Batch or lot size characteristics dmain product or line of products	,085	,314	,022	,271	,787	,949	1,054
	Firm_Age	-,106	,095	-,093	-1,123	,263	,930	1,075
2	(Constant)	11,327	10,957		1,034	,303		
	Food_Industry	5,966	9,946	,060	,600	,550	,655	1,528
	Textile_Industry	-13,630	9,108	-,151	-1,497	,137	,643	1,555
	Construction_Industry	-8,403	10,490	-,074	-,801	,424	,763	1,311
	Chemical_Industry	10,427	9,068	,113	1,150	,252	,678	1,475
	Machinery_Industry	-2,237	8,176	-,028	-,274	,785	,606	1,649
	Electronic_Industry	8,199	8,155	,102	1,005	,316	,627	1,595
	SizeINV	-16,031	122,152	-,013	-,131	,896	,710	1,408
	Innovation_Intensity	,409	,661	,064	,620	,536	,607	1,647
	simple products Batch or lot size characteristics dmain product or line of products	-,442	6,137	-,006	-,072	,943	,820	1,220
	complex products Batch or lot size characteristics dmain product or line of products	,084	,316	,022	,265	,791	,946	1,057
	Firm_Age	-,103	,095	-,091	-1,080	,282	,924	1,082
	Producer of finished goods for consumers	4,314	7,592	,050	,568	,571	,854	1,170
	CERRP	-,069	,964	-,007	-,072	,943	,685	1,459
3	(Constant)	19,700	13,380		1,472	,143		
	Food_Industry	7,113	9,995	,071	,712	,478	,647	1,545
	Textile_Industry	-14,413	9,130	-,159	-1,579	,117	,639	1,564
	Construction_Industry	-8,356	10,483	-,074	-,797	,427	,763	1,311
	Chemical_Industry	9,837	9,078	,106	1,084	,280	,676	1,480
	Machinery_Industry	-2,660	8,180	-,034	-,325	,746	,605	1,653
	Electronic_Industry	8,410	8,152	,105	1,032	,304	,627	1,596
	SizeINV	-16,425	122,071	-,013	-,135	,893	,710	1,408
	Innovation_Intensity	,411	,660	,064	,623	,534	,607	1,647
	simple products Batch or lot size characteristics dmain product or line of products	-1,360	6,190	-,020	-,220	,826	,804	1,243
	complex products Batch or lot size characteristics dmain product or line of products	,083	,316	,022	,261	,794	,946	1,057
	Firm_Age	-,097	,096	-,085	-1,011	,314	,921	1,086
	Producer of finished goods for consumers	4,156	7,588	,048	,548	,585	,854	1,171
	CERRP	-2,814	2,698	-,284	-1,043	,299	,087	11,440
	CERRP_int_customertype	2,329	2,138	,292	1,089	,278	,090	11,087

a. Dependent Variable: DTurnover

Appendix E: coefficients post-hoc education level and turnover: realized potential

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	11,746	10,858		1,082	,281		
	Food_Industry	7,485	9,395	,075	,797	,427	,725	1,379
	Textile_Industry	-12,911	8,881	-,143	-1,454	,148	,669	1,496
	Construction_Industry	-8,241	10,422	-,073	-,791	,430	,764	1,310
	Chemical_Industry	11,077	8,944	,120	1,239	,218	,689	1,452
	Machinery_Industry	-2,399	8,114	-,030	-,296	,768	,608	1,644
	Electronic_Industry	8,482	8,062	,106	1,052	,295	,634	1,577
	Firm_Age	-,106	,095	-,093	-1,123	,263	,930	1,075
	simple products Batch or lot size characteristics dmain product or line of products	-,408	6,030	-,006	-,068	,946	,839	1,192
	complex products Batch or lot size characteristics dmain product or line of products	,085	,314	,022	,271	,787	,949	1,054
	SizeINV	-12,621	120,323	-,010	-,105	,917	,723	1,382
	Innovation_Intensity	,371	,595	,058	,623	,534	,739	1,354
2	(Constant)	8,599	11,075		,776	,439		
	Food_Industry	6,319	9,562	,063	,661	,510	,691	1,448
	Textile_Industry	-14,260	8,987	-,157	-1,587	,115	,644	1,553
	Construction_Industry	-8,628	10,388	-,076	-,831	,408	,758	1,319
	Chemical_Industry	9,515	8,938	,103	1,065	,289	,680	1,470
	Machinery_Industry	-6,750	8,559	-,086	-,789	,432	,539	1,854
	Electronic_Industry	5,048	8,214	,063	,615	,540	,603	1,659
	Firm_Age	-,099	,095	-,087	-1,044	,298	,903	1,107
	simple products Batch or lot size characteristics dmain product or line of products	1,269	6,053	,018	,210	,834	,821	1,218
	complex products Batch or lot size characteristics dmain product or line of products	,107	,313	,028	,341	,733	,943	1,061
	SizeINV	-35,196	120,090	-,028	-,293	,770	,716	1,396
	Innovation_Intensity	,583	,713	,091	,818	,415	,508	1,970
	Graduate degree, PhD qualification level of your employees percent	,373	,192	,169	1,946	,054	,838	1,194
	WPIRP	-,447	,827	-,057	-,541	,589	,565	1,770
3	(Constant)	4,190	11,450		,366	,715		
	Food_Industry	6,122	9,526	,061	,643	,522	,690	1,448
	Textile_Industry	-15,628	9,003	-,173	-1,736	,085	,637	1,570
	Construction_Industry	-9,634	10,372	-,085	-,929	,355	,755	1,325
	Chemical_Industry	9,981	8,910	,108	1,120	,265	,679	1,472
	Machinery_Industry	-6,456	8,529	-,082	-,757	,450	,539	1,855
	Electronic_Industry	4,927	8,183	,062	,602	,548	,603	1,659
	Firm_Age	-,125	,097	-,110	-1,291	,199	,873	1,145
	simple products Batch or lot size characteristics dmain product or line of products	1,108	6,031	,016	,184	,855	,821	1,218
	complex products Batch or lot size characteristics dmain product or line of products	,113	,312	,030	,362	,718	,942	1,061
	SizeINV	-32,682	119,646	-,026	-,273	,785	,716	1,396
	Innovation_Intensity	,432	,718	,068	,602	,548	,497	2,013
	Graduate degree, PhD qualification level of your employees percent	,884	,403	,401	2,193	,030	,188	5,317
	WPIRP	-,549	,827	-,070	-,664	,508	,561	1,783
	WPIRP_int_Edu	-,077	,053	-,264	-1,439	,152	,188	5,326

a. Dependent Variable: DTurnover

Appendix F: Coefficients post-hoc education level and production costs: realized potential

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	4,580	,456		10,034	,000		
	Food_Industry	-,169	,395	-,040	-,428	,669	,725	1,379
	Textile_Industry	-,286	,373	-,075	-,765	,446	,669	1,496
	Construction_Industry	-,151	,438	-,031	-,344	,731	,764	1,310
	Chemical_Industry	-,439	,376	-,112	-1,167	,245	,689	1,452
	Machinery_Industry	-,091	,341	-,027	-,266	,791	,608	1,644
	Electronic_Industry	-,082	,339	-,024	-,242	,809	,634	1,577
	Firm_Age	,007	,004	,140	1,688	,094	,930	1,075
	simple products Batch or lot size characteristics dmain product or line of products	-,184	,254	-,063	-,726	,469	,839	1,192
	complex products Batch or lot size characteristics dmain product or line of products	-,012	,013	-,077	-,937	,350	,949	1,054
	SizeINV	-6,828	5,059	-,127	-1,350	,179	,723	1,382
	Innovation_Intensity	-,067	,025	-,250	-2,695	,008	,739	1,354
2	(Constant)	4,470	,466		9,590	,000		
	Food_Industry	-,307	,402	-,073	-,763	,447	,691	1,448
	Textile_Industry	-,389	,378	-,102	-1,029	,305	,644	1,553
	Construction_Industry	-,211	,437	-,044	-,482	,630	,758	1,319
	Chemical_Industry	-,464	,376	-,119	-1,235	,219	,680	1,470
	Machinery_Industry	-,179	,360	-,054	-,497	,620	,539	1,854
	Electronic_Industry	-,084	,346	-,025	-,244	,808	,603	1,659
	Firm_Age	,008	,004	,163	1,956	,052	,903	1,107
	simple products Batch or lot size characteristics dmain product or line of products	-,187	,255	-,064	-,733	,465	,821	1,218
	complex products Batch or lot size characteristics dmain product or line of products	-,011	,013	-,068	-,827	,409	,943	1,061
	SizeINV	-6,325	5,054	-,117	-1,251	,213	,716	1,396
	Innovation_Intensity	-,099	,030	-,369	-3,311	,001	,508	1,970
	Graduate degree, PhD qualification level of your employees percent	-,002	,008	-,020	-,226	,821	,838	1,194
	WPIRP	,066	,035	,201	1,903	,059	,565	1,770
3	(Constant)	4,336	,484		8,966	,000		
	Food_Industry	-,313	,402	-,074	-,778	,438	,690	1,448
	Textile_Industry	-,431	,380	-,113	-1,133	,259	,637	1,570
	Construction_Industry	-,241	,438	-,050	-,551	,583	,755	1,325
	Chemical_Industry	-,450	,376	-,115	-1,197	,234	,679	1,472
	Machinery_Industry	-,170	,360	-,051	-,472	,637	,539	1,855
	Electronic_Industry	-,088	,346	-,026	-,255	,799	,603	1,659
	Firm_Age	,007	,004	,147	1,737	,085	,873	1,145
	simple products Batch or lot size characteristics dmain product or line of products	-,192	,255	-,066	-,752	,453	,821	1,218
	complex products Batch or lot size characteristics dmain product or line of products	-,011	,013	-,066	-,814	,417	,942	1,061
	SizeINV	-6,248	5,053	-,116	-1,236	,218	,716	1,396
	Innovation_Intensity	-,104	,030	-,386	-3,427	,001	,497	2,013
	Graduate degree, PhD qualification level of your employees percent	,014	,017	,147	,802	,424	,188	5,317
	WPIRP	,063	,035	,191	1,808	,073	,561	1,783
	WPIRP_int_Edu	-,002	,002	-,189	-1,033	,303	,188	5,326

a. Dependent Variable: percent change in production costs per product unit in 2014