Public version

Master Thesis – Business Administration – Innovation & Entrepreneurship

BREAKING DOWN BARRIERS:

An explorative study into the barriers experienced when accessing and managing national government incentives for circular innovation.

Radboud Universiteit

Lara Habold – S1024496

Date: 21-06-2020

Programme: Innovation & Entrepreneurship

Internship firm: Boonstoppel Subsidie Advies B.V.

Company supervisor: Bernie Kruisbergen

Supervisor: Dr. Robert Kok

Examiner: Dr. Peter Vaessen

Preface

Hereby I present you my Master Thesis 'Breaking Down Barriers: An explorative study into the barriers experienced when accessing and managing government incentives for circular innovation'. Not only is this thesis the cherry on top of my master Innovation & Entrepreneurship, it might also be the hardest job I ever had to do.

First of all, I would like to thank my supervisor, Dr. Robert Kok, for his feedback and support throughout the whole process. From the thesis circles in the first block to the individual meetings, there are so many things that I have learned throughout the process, and I partially have you to thank for that. Secondly, I would like to thanks my colleagues at Boonstoppel Subsidie Advies, especially Bernie Kruisbergen. Thank you for bringing me in to contact with the researched companies, for allowing me to interview some of you and for teaching me a lot about government incentives and working as a consultant.

I would also like to thank the managers of the researched firms for taking the time for me and for allowing me to gain an understanding of your business and your innovations. The Coronavirus cannot have been an easy period for your, which makes it extra special to me that you took the time to answer my questions. Furthermore, I would like to thank Kiemt for the interview. We did not only stick to the interview questions, but you have taught me things that are way beyond the scope of my thesis.

Lastly, I would like to thank my friends, family and the rest of my thesis group. Thank you for helping me, reading parts of my thesis and the endless support.

I hope you enjoy reading my master thesis!

Lara Habold

Nijmegen, June 2020

Abstract

The purpose of this research was to understand the process of accessing and managing national government incentives for circular innovation and the barriers that managers of SMEs experience in the process of obtaining these. This explorative research was carried out through a multiple case study, in which managers of Dutch SMEs operating in the manufacturing industry were interviewed. Additionally, experts from an intermediary that assists SMEs with the obtainment of government incentives and experts from a valley organisation specialized in the CE were researched. This resulted in a description of the process of obtaining government incentives and an understanding of the barriers that match the two moments, accessing and managing government incentives. Accessing government incentives exists of the steps obtaining information, go/no-go decision (by intermediary), administrative requirements, submit application and go/no-go decision (by government). Managing government incentives exists of the steps managing the government incentive and finishing the government incentive project. Government incentives for circular innovation are similar to government incentives for regular innovation. The experienced barriers when accessing government incentives are: the managers expectations regarding chance, the managers expectations regarding eligibility, the lack of information, the lack of knowledge and capabilities within the organization, the lack of need for the incentive and the administrative burden. The only barrier experienced when managing government incentives is the administrative burden. Furthermore, this research highlights the importance of the intermediary in the process. The types of intermediaries that SMEs use are: branch organisations, a commercial organisation, an individual such as a product designer, a university/research institution or a valley organisation. The intermediary influences the relationship between some of the experienced barriers and the access to government incentives in several ways. The barriers influenced by the use of an intermediary are: the managers expectations regarding chance and eligibility, the information available and the administrative burden.

Keywords: circular innovation, government incentives, subsidies, barriers to subsidies, small-medium enterprise, manufacturer, intermediary.

Table of contents

List of tables and figures

List of tables

List of figures

Abbreviations used

CE – Circular Economy
CI – Circular innovation
GI – Government incentive
SME – Small-medium enterprise

Chapter 1. Introduction

1.1 Circular innovation and government incentives

As the world population grows, so does the need for natural resources. However, the amount of natural resources available is declining rapidly (Anastasiades et al., 2020), causing governments and businesses to have to come up with innovative solutions (Rijksoverheid, n.d.[b]). The Dutch Government has even called this shortage of natural resources the biggest challenge of the 21st century. One of the answers to this problem, categorised under the umbrella of sustainability, is the circular economy (CE) (Ranta et al., 2019). The CE is defined as a closed-loop, restorative and regenerative economic system (Bocken et al., 2016), maximising the value of material resources while minimising overall resource use, gas emissions, waste and pollution (Geissdoerfer et al., 2017).

Over the past years, this circularity has become a hot topic and has increasingly received attention in research (Anastasiades et al., 2020). As the CE is property of a whole system rather than of individual products or services, transitioning towards this CE requires product, business model and ecosystem innovation (Adams et al., 2015; Ceschin and Gaziulusoy, 2016). This innovation is an essential tool for organisations to gain competitive advantage and improve organisational success (Amabile, 1988; Hillebrand et al., 2011; Singh et al., 2019; Arranz et al., 2019). This research, focussing on Dutch manufacturers, will look into circular innovation (CI), or, more specifically: circular product innovation. As no definition for circular innovation was found, the definition of circular product innovation is partly based on a definition provided by Bocken et al. (2016), who studied circular business models. It is defined as '*perceived changes to the physical product, that aim to make already existing products circular or introductions of completely new circular products, in which circularity means more durable products, products that are refurbished or recycled, or products that significantly reduce the use of materials.'*

Most of the existing research regarding circularity examined big industries (Bassi and Dias, 2019). This is interesting as 99% of the total enterprises within the European Union is a small-medium enterprise (SME; any business that employs less than 250 people) (Filipe et al., 2015). Dutch SMEs that want to get involved in sustainability often focus on circularity. This is no surprise, as the Dutch government stimulates the CE profoundly, and even developed a plan in 2016 called 'the Netherlands circular by 2050 (Nederland circulair in 2050)'. With this, the aim is to have the Netherlands become utterly circular by 2050 (Rijksoverheid, n.d.[a]). The objective for 2030 is to have reduced the use of primary resources (mineral, fossils and metals) by 50% (Rijksoverheid, 2016).

To help the Dutch economy with this shift towards a CE, national-level policies have been adopted (Repo et al., 2018). In the Netherlands, essential policies have to do with financial punishments (e.g.

taxes) for companies harming the environment, and the stimulation of so-called 'green' innovations (CPB, 2018). The government set aside an amount of €80 million for 2019 and 2020, giving SMEs a considerable opportunity to help and innovate. Of this €80 million, €40 million was set aside for 'other projects that help the CE', with which SMEs and innovative start-ups are targeted specifically (Rijksoverheid, 2019). This money was put into national subsidies, and financial and fiscal arrangements (government incentives; GIs) (RVO, n.d.), as the government assumes that financial resources help to increase the number of CIs.

However, research shows that many SMEs experience barriers when accessing and managing (obtaining) these incentives (Meijer et al., 2019; Tiwari and Buse, 2010; Pihkala et al., 2002). The process of obtaining GIs is often time-consuming (involving administrative activities) and perceived to be unfair (Meijer et al., 2019). In the Netherlands, for example, governmental agencies are perceived to favour early-stage innovation over more mature ones (Meijer et al., 2019). Furthermore, research carried out in the Netherlands shows that SMEs experience the obtainment of GIs as a long road that can easily take one and a half year, by which the market opportunity can be gone (Meijer et al., 2019).

1.2 Research objective and question

The CE is a hot topic and has gained interest quickly. The Dutch government is aiming to have the Netherlands become 100% circular by 2050. To reach these goals, they have set aside an extra €80 million for circular projects. This money was partly put into government incentives. There is much literature available about the effect of GIs on innovation, and the barriers related to accessing external funding for innovation (e.g. Polzin, 2017). However, no study has looked explicitly into barriers related to GIs. Secondly, research states that SMEs experience barriers in accessing as well as managing GIs. These are different moments within the process and might come with different barriers. The amount of time necessary for obtaining GIs might, for example, be a barrier more relevant to the process of accessing incentives. The administrative burden might start later on when the incentive has to be managing. No literature was found in which accessing and managing GIs were researched separately. Lastly, studies have never analysed barriers within the context of CI.

Therefore, the aim of this research is to study which barriers managers of Dutch SMEs experience throughout the process of obtaining subsidies and financial and fiscal arrangements for CI. Furthermore, this study aims to get an understanding of the process of obtaining GIs.

The research question is:

What are the barriers that managers of Dutch SMEs experience when accessing and managing national government incentives for circular innovation?

1.3 Practical and theoretical relevance

This study contributes to existing research about experienced barriers when accessing and managing GIs for CI. Research by Sandberg and Aarikka-Stenroos (2014) and Guldmann and Huulgaard (2020) identifies cost/financial barriers or economic barriers as one category of innovation barriers. Some studies were found that studied barriers to subsidies (e.g. Meijer et al., 2019; Cecere et al., 2018) as part of another subject. Other research looks at barriers to subsidies in a different context (e.g. Shlay, 2004). This study adds to the existing literature by defining the barriers experienced by managers of Dutch SMEs, involved in obtaining GIs for CI. Furthermore, this research will add to the existing literature by describing the process of securing GIs for CI. Lastly, this research will add to the existing literature by describing the types of GIs available for Dutch SMEs that are involved in circular product innovation.

This research will not only contribute to academic research on CI and GIs, but is also relevant for (managers of) SMEs. It provides an insight into the barriers that SMEs that are applying for GIs for CI are experiencing as well as how these barriers influence their innovation activities. Based on the results of this research, SMEs will gain insights into the process of obtaining GIs, and especially into what barriers they can expect when trying to access and manage these.

1.4 Scope of this research

First, this research focuses on SMEs. SMEs are defined as: *''(…) independent firms which employ fewer than a given number of employees. This number varies across countries. The most frequent upper limit designating an SME is 250 employees, as in the European Union''* (OECD, 2005). Furthermore, the OECD (2005) states that SMEs can apply for specific funding programs and state aid, and can receive a higher intensity of national and regional assistance than large companies can. The maximum turnover per year should, for an SME, not exceed €50 million. The focus of this research will be on Dutch manufacturers, producing CIs. According to Kakaomerlioglu and Carlsson (1999), a manufacturer (especially a small one) plays an essential role in innovation as it is an organisation or producer that manufactures goods. Sustainable manufacturing is an initiative that can support economic growth while also taking the environment into account (Malek and Desai, 2020). All manufacturers studied for this research produce at least one circular product. The scope of this research will, therefore, also include product innovation, which will be further explained in Chapter 2. Lastly, this research will only focus on national GIs, provided by the Dutch government. There are plenty of European incentives; however, this research will only look into national ones.

1.5 Thesis structure

This thesis is structured as follows. The first chapter discussed the research background and the objective and question of this research. The second chapter describes a theoretical framework, or literature review,

on the used theoretical concepts. The focus of this is on CI and the use of subsidies. Chapter 3 will discuss the methods used for this research. Here, the research cases are introduced, and methodological choices are explained. The results of this research can be found in chapter four, and the conclusion and discussion, including managerial implications and options for further research, will be discussed in chapter five.

Chapter 2. Theoretical framework

This chapter will discuss existing theory regarding the subjects innovation (including NPD and R&D), sustainable and circular innovation, perceived CI barriers and Dutch GIs meant for CIs. Multiple definitions regarding these topics, as discussed by scholars, are given as well as the final definition used for this study. Furthermore, this chapter will discuss what is currently known about the subjects. Lastly, a conceptual model will be presented.

2.1 Innovation

Innovation in all its different forms and types is a subject studied intensively, as it is crucial for the long-term competitiveness of firms. Starting with one of the earliest and most referred to definitions of innovation, Schumpeter (1934, p. 66) defines innovation as a: *''recombination of current resources to create a new production function"*. The Organisation for Economic Co-operation and Development (OECD) manual defines innovation in the same broad way, namely as: "*a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)"* (OECD, 2005). Thus, "invention," "novelty," and "change" describe the nature of innovation (Edwards-Schachter, 2018). Schumpeter was by some even referred to as the father of the study of innovation (Neto et al., 2019), and identified five cases of possible new combinations (as cited in Neto et al., 2019): the introduction of a new good, the introduction of a new production method, opening a new market, the achievement of a new source of supply of raw materials or semi-manufactured goods and the establishment of a new way of organizing an industry.

However, innovation can significantly differ in its degree of novelty. Some scholars argue that it is the degree of newness that defines what innovation is. Van de Ven et al. (1986, p. 592) state that: "*as long as the idea is perceived as new to the people involved, it is an 'innovation' even though it may appear to others to be an 'imitation' of something that exists elsewhere"*. Innovation is often divided into either two or four categories. Some scholars only distinguish incremental and radical innovations (e.g. Dewar and Dutton, 1986; Dosi, 1982), whereas, for product innovation, other scholars define incremental innovations, market breakthroughs, technological breakthroughs and radical innovation (e.g. Chandy and Tellis, 1998). According to Chandy and Tellis (1998), *incremental innovations* involve relatively small changes in technology and low customer benefits. *Market breakthroughs* are based on existing core technology but provide great customer benefits. *Technological breakthroughs* adopt a substantially different technology but do not offer superior customer benefits. Lastly, *radical innovations* involve substantially new technology while also providing excellent customer benefits. Table 1 shows a schematic overview of these categories of innovation.

Table 1: types of product innovation (Chandy and Telllis, 1998)

		Customer need fulfilment per dollar	
		Low	**High**
Newness of technology	**Low**	Incremental innovation	Market breakthrough
	High	Technological breakthrough	Radical innovation

Kim and Mauborgne (2004) state that innovation can happen on three platforms: product innovation (e.g. the physical product), service innovation (e.g. services to customers such as guarantees) and delivery innovation (e.g. logistics and channels used to transfer the product to customers). For this research, the focus will only be on product innovation, as the scope of this research is the manufacturing industry and organisations that create (a) circular product(s). This means that all organisations have been involved in circular product innovation. Looking at the term product from a market perspective, Krishnan and Ulrich (2001, p. 3) define it as a: *''a bundle of attributes''*. For this study, (product) innovation is defined as: '*perceived changes, whether incremental, market breakthroughs, technological breakthroughs or radical, to a firm's products'*.

Product innovation is the most popular type of innovation (Edwards-Schachter, 2018). Product innovation is still closely linked to process, service or business model innovation as it often requires significant changes to infrastructure, input and techniques (Gault, 2018). One current trend in product innovation is the use of consumers, or end-users, in the innovation process, as initiated in literature by the book Democratizing Innovation, written by Von Hippel (2005). According to Von Hippel there are significant advantages of user-centred or user-led innovations over the manufacturer-centred approach. This idea has been picked up and used by a variety of scholars (Edwards-Schachter, 2018).

The development of product innovation is based on two types of learning processes: exploration and exploitation (Atuahene-Gima and Murray, 2007; Cohen and Levinthal, 1989; Fiol and Lyles, 1985; Lennerts et al., 2020). According to He and Wong (2004), *exploitation* can be defined as *''the continuous search for improvement along a fixed production function''*, while *exploration* is defined as *''a discontinuous shift from one production function to another that is more profitable''*. Although there is tension between exploring and exploiting, an appropriate balance between the two is necessary for firm survival and prosperity (March, 1991). Making sure that an organisation is exploiting sufficiently to ensure its current viability while also exploring enough to ensure future viability was defined by O'Reilly (1996) as the ambidextrous organisation, or ambidexterity theory (as cited in He and Wong, 2004).

2.1.1 New Product Development

Product innovation is often done through a process of New Product Development (NPD). Krishnan and Ulrich (2001) define NPD as the process in which a market opportunity is transformed into a product available for sales. The design of the NPD process is an organisational resource, and is related to NPD success (Cooper and Kleinschmidt, 1995). While this process differs per organisation and innovation, the general steps include predevelopment, development and commercialisation (Reid and Brady, 2012). The NPD process often includes sequential steps that include checkpoints, or so called 'gates' (Weelwright and Clark, 1992). This gates exist of checklists or tasks to be completed (Clarkson and Eckert, 2010). While these linear models have proven to show a simple and effective representation of the flow, scholars argue that these models do often not reflect the dynamic behaviour of NPD (McCarthy et al., 2006).

2.1.2 Research and development

Many of the Dutch GIs for innovation are meant for research and development (R&D) activities. This is not surprising, considering R&D is often described as the pathway to innovation (Hayter and Clapp, 2020). There is not much literature that describes the differences and similarities between innovation and R&D. An explanation for this could be that scholars often see R&D as a part, usually the beginning, of the innovation process (Mairesse and Mohnen, 2005). Hall et al. (2013) even state that R&D investment, the financial side of R&D, is directly used as input for innovation. R&D groups are often involved in innovation projects (Souder and Chakrabarti, 1978) and areas of innovation research often include R&D expenditure (Lach and Sauer, 2002). This investment in R&D is even described as a determinant of innovation (Kaiser, 2002). Many European governments are pursuing ambitious R&D policies in order to foster innovation and economic growth (Bilbao-Osorio and Rodríguez-Pose, 2004). Still, in many European countries, innovation (including R&D) and investment in R&D have been areas of relative underperformance (Griffith et al., 2006).

Hall et al. (2013) describe the Crépon-Duguet-Mairesse (CDM) framework. This model relates to R&D, innovation and productivity, and shows three groups of relations that connect decisions regarding these three topics. The first group consists of the decision to invest in R&D or not, and if so, how much to invest. The second group consists of innovation outcomes, for the scope of this research this is the introduction of a new or improved product or innovation associated with product innovation. Hall et al. (2013) state that these outcomes are driven by the decisions made by an organisation regarding R&D investment. The third and final group is a labour productivity regression, which includes the innovation outcome as well. In short, they state that R&D investments, and thus the amount of money invested into R&D, influence innovation outcomes, which in turn influence productivity.

According to the OECD (n.d.[a]) innovation goes far beyond R&D. They define R&D as: *''creative work undertaken on a systematic basis in order to increase the stock of human knowledge and to devise new applications based upon it''* (OECD, n.d.[b]), while innovation is defined as: *''the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations''* (OECD, 2009[b]). Thus, for this research R&D activities are part of the innovation process, but are used at the beginning to increase the stock of human knowledge. Innovation starts at the research stage already, but goes further, all the way through to the implementation of the actual product, whereas R&D finishes when the required knowledge is obtained.

Currently, more organisations are focusing on sustainable research and development (Stahl et al., 2019). Increased funding in R&D even ensures a cleaner and more sustainable biosphere (Charfeddine and Kahía, 2019). Wang and Zhang (2020) for example found that in BRICS (Brazil, Russia, India, China and South Africa) countries every 1% increase in R&D investment can decrease carbon emission by 0.8122%. As the production processes of these 'developing' countries appear as if they are in early stages of industrialisation, with carbon emissions matching this (Wang and Zhang, 2020), these results might differ for more developed countries, such as the Netherlands. Still, Banerjee and Gupta (2019) found that an increase in environmentally sustainable practices increases R&D intensity, and thus results in a higher number of innovations, especially in countries where R&D infrastructure supports are superior.

2.2 Sustainable and circular innovation

The CE is an innovation-driven phenomenon, which is primarily driven by the ongoing sustainability transition (Esposito et al., 2018). As mentioned in Chapter 1, no definition was found for CI specifically. As circularity is an aspect of sustainability, this concept will be defined first. Before, firms used to mainly stimulate economic benefit (Terán-Yépez, 2020). However, currently, the growing importance of environmental issues and the emergence of the concept of sustainable development has changed this view (Terán-Yépez, 2020). Scholars are now starting to see that the combination of ecological and technological innovation may lead to win-win situations, in which improvements in environmental quality and economic growth coexist (Lin and Zheng, 2016). Achterkamp and Vos (2006, p. 530) define sustainable innovation as: *"the outcome of the innovation process somehow displays sustainability"*. Steiner (2008, p. 596-597) refer to sustainable innovations as innovations that help *''sustainable development from an economic, ecological and social point of view''*. Both definitions are broad in the sense that they don't describe sustainability or sustainable development in itself.

In literature, sustainability is often described through the Sustainable Development Goals (SDGs), as developed by the United Nations. In 2015, the United Nations came up with 17 goals (SDGs) to reach sustainable development (United Nations, 2020.). However, without the systematic support of businesses, society will not achieve these goals (Hockerts and Wüstenhagen, 2010; Nawaz and Koç, 2018). Sustainable development requires both sustainable innovation and sustainable entrepreneurs or intrapreneurs that put these sustainable innovations at the core of their business (Schaltegger and Wagner, 2011).

Little (2005, p. 3) defines sustainability-driven innovation as: *"the creation of new market space, products and services or processes driven by social, environmental or sustainability issues*". Charter and Clark (2007, p. 9) state that sustainable innovation is: *"a process where sustainability considerations (environmental, social, financial) are integrated into company systems from idea generation through to research and development (R&D) and commercialization. This applies to products, services and technologies, as well as new business and organisation models".* According to Newton (2003, p. 5), sustainable oriented innovations refer to innovations that ensure *''a social structure can be maintained profitably and indefinitely, without degrading the systems on which it depends"* (as cited in Trischler et al., 2020). In general, most literature defines sustainable innovation in the same way as regular innovation, adding a different purpose and direction, namely: environmental and social considerations (Bos-Brouwers, 2009). Just like regular innovations, while sustainable innovations are often still manufacturer-driven, firms are starting to realize the importance of involving end-users in the process (Schot et al., 2016). The reason for this is that they are *"critical to accelerate the rate of innovative solutions penetrating the market"* (Sopjani et al., 2018, p. 2).

One alternative that helps the shift towards sustainable development is the CE (Adams et al., 2015). The CE is defined as a closed-loop, restorative and regenerative economic system (Bocken et al., 2016), maximizing the value of material resources while minimizing overall resource use, gas emissions, waste and pollution (Geissdoerfer et al., 2017). As mentioned previously, no definitions were found for CI. Ranta et al. (2019) look at several forms of innovation, such as product innovation, and define multiple these through CE literature. Although their research focusses on the value creation of CI practices, the definitions used are also relevant to this study. An overview of the definitions can be found in Table 2.

At the micro-level, research regarding the CE mainly focuses on the analysis of CIs, the circular business model and the implementation of different circular-related practices (Aranda-Usón et al., 2019). Looking at CE while combining multiple levels (e.g. organisational and macro), research includes the supply chain system effects on CE (Tseng et al., 2020). As this research will focus on CI within SMEs, the focus will be on the micro-level, so product innovation as a circular-related practice. Research shows a positive correlation between CI and business performance, especially in terms of business innovation

(Mura et al., 2020). Firm size and the percentage of total turnover devoted to R&D may become crucial factors in the development of sustainable innovations (Bassi and Dias, 2019). This implies that in the future, SMEs might experience more disadvantages related to CI than larger organizations will.

Table 2: Different innovation forms and how they enable value creation in the CE (Ranta et al., 2019)

Innovation form	As discussed in the innovation literature	As exemplified in the CE literature
Product	Products that are perceived as meaningfully new, novel, original, or unique. (Henard & Szymanski, 2001; Wang & Ahmed, 2004)	More durable products, products that are refurbished or recycled, or products that significantly reduce use of materials (Bocken et al., 2016)
Process	"Introduction of new production methods, new management approaches, and new technology that can be used to improve production and management processes." (Wang & Ahmed, 2004, p. 304)	Processes that prevent the generation of waste by facilitating value in products to be maintained or increased. For example, recycling (Ghisellini et al., 2016), remanufacturing (Lieder & Rashid, 2016), and product take-back processes (Lewandowski, 2016)
Service	"New services have been introduced to the market, or existing services have been significantly improved or important changes have been made to their basic characteristics, intangible components, or desired purposes." (Santamaría, Jésus Nieto, & Miles, 2012, pp. 148–149)	Services allow products and materials to maintain their value for longer, or increase the value creation potential of a single product. For example, maintenance services or sharing services (Spring & Araujo, 2017; Tukker, 2015)
Business model	"Business-model innovation occurs when a firm adopts a novel approach to commercializing its underlying assets" (Gambardella & McGahan, 2010, p. 263)	New ways for firms to offer and capture value from reduced sales of new products and materials, for example, pricing products as services with payments through monthly fees. (Goyal, Esposito, & Kapoor, 2018; Ranta, Aarikka-Stenroos, & Mäkinen, 2018)

What most research has in common is that it supports the use of CI as it helps to obtain environmental protection while also sustaining economic development (Guohui and Yunfeng, 2011; Rabta, 2020; Tseng et al., 2020; Ranta et al., 2019; Ghisellini et al., 2016). According to the OECD (2009[a]), sustainable innovation can not only be environmentally motivated but can also be a side-effect of other purposes (e.g. decreasing production costs). CI, in this research, is partly based on the definition provided by Bocken et al. (2016) and is defined as: *''perceived changes to the physical product, that aim to make already existing products become circular, or introductions of completely new circular*

products. Circularity means: more durable products, products that are refurbished or recycled, or products that significantly reduce the use of materials.''

2.2.1 Strategies, practices and methods of circular innovation

In general, the circular practice most used by SMEs is recycling or reusing or reselling waste (54.4% of European SMEs) (Bassi and Dias, 2019). However, this is not the only way in which organisations can add to circularity. CI can be used as a business opportunity, for example, by manufacturing companies (that create CIs to be used by other organisations and consumers) (Blomsma et al., 2019). At the micro-level, where circular models are implemented by individual actors, several methods are used (de Jesus et al., 2018). These methods include (1) cleaner production; (2) new business models, selling services instead of products; (3) eco-design (increased functionality, modular parts, enabling reuse of parts, refurbishment, etcetera); and (4) de-materialisation (internet, packaging) (de Jesus et al., 2018).

Kristensen and Mosgaard (2020) researched nine CE categories that emerged, at the micro-level, from data-driven coding. This means that organisations, and thus SMEs, can use these categories as circular practices. These categories are:

- Recycling – *''Recycled content in new or remanufactured products and potential to recycle materials after use of products''*;
- Remanufacturing – *''Remanufacturing of products or components through work done and addition of new or used product parts, components etc. Refurbishment and recondition are included in this category''*;
- Reuse – *''Reuse of whole product with no or minor adaptations and/or work, or reuse of components/modules in a new product''*;
- Resource-efficiency – *''Traditional resource-efficiency; optimising resource use in products''*;
- Disassembly – *''Disassembly of products to enable other CE strategies. This category includes disassembly sequence, tools, time, work flow etcetera''*;
- Lifetime extension – *''Lifetime extension through considerations of durability and use of products, including repair of products''*;
- Waste management – *''Different waste management strategies, including zero waste, waste generation, linear flow (virgin materials) and unrecoverable waste from production''*;
- End-of-life management – *''Methods of comparing different end-of-life management options such as recycling, reuse and disposal''*;
- Multidimensional indicators – *''Indicators that combine different parameters and measures, which demonstrates the diversity of CE''*.

Blomsma et al. (2019) looked into CE strategies, used explicitly by manufacturers. There are plenty of CE strategies that manufacturers can use in their daily operations. To continue their activities, businesses

need to create and capture value. CI strategies should, therefore, also generate and capture value. Blomsma et al. (2019) used the Circular Strategies Scanner, as developed by Potting et al. (2017). This Circular Strategies Scanner is a framework that visualises CE strategies and the value that they capture. Blomsma et al. (2019) adapted the framework for manufacturers and summarised the results into a table, showing the drivers, strategies, definitions and examples of circular strategies. They divided the strategies into Reinvent (refuse), Rethink & reconfigure (revolution and replace), Restore, reduce & avoid and Recirculate. The complete overview, including examples, can be found in Appendix 1, Table A1. This table will not be used for this research. However, it does help to understand the micro-level practices better.

2.3 Sustainable and circular innovation barriers

Even though SMEs are increasingly aware of the benefits of CIs (Rizos et al., 2016), the policies, and thus practices, in place have only been adopted by a small number of firms (Bassi and Dias, 2019; Mura et al., 2020). An explanation for the low adoption rate of these policies and practices could be that most companies experience barriers at all four socio-technical levels (the market level, the institutional and value chain level, the organisational level and the employee level) (Guldmann and Huulgaard, 2020). Although no definition of innovation barriers was found, some words that often come up in relation to barriers are: '*disadvantage*', '*constraint*', '*lack of*' (e.g. Freel, 2012), and '*prevents*' (e.g. Fisher, 1979).

Some scholars have looked at sustainable business model innovation from an organisational design perspective, and found barriers on three levels: the institutional, the strategic and the operational (Bocken and Geradts, 2019). Gupta and Barua (2018) defined seven, more specific, categories of barriers to green, sustainable innovation that SMEs experience. These seven barriers are (1) managerial, organisational and human resource-related barriers, (2) technological and green resource-related barriers, (3) financial and economic barriers, (4) poor external partnership and stakeholders engagement, (5) lack of government support for green initiatives, (6) market and customer-related barriers, and (7) insufficient knowledge and information regarding green practices. Furthermore, SMEs might lack technical skills (Rizos et al., 2016; Galvão et al., 2018).

The most significant barrier seems to be the lack of financial resources that SMEs experience (as mentioned in research by Rizos et al., 2016; Galvão et al., 2018; Meijer et al., 2019; Kaufmann and Tödtling, 2002; Rahbauer et al., 2018). Additionally, the majority of SMEs does not think CIs would increase their profits and competitiveness (Ormazabal et al., 2018). Financial barriers to green, sustainable, innovation for SMEs specifically include the lack of access to government subsidies and financial incentives (Cecere et al., 2018; Hojnik and Ruzzier, 2016). Public funds, such as subsidies are somewhat complementary to other funds and access to public funds are effective in improving a firm's ability to introduce eco-innovations, or green innovations (Cecere et al., 2018). However, research

shows that regional and national funding could be simplified in order to reduce administrative burdens and make them more accessible to SMEs (Cecere et al., 2018).

2.3.1 Circular innovation barriers

Literature states that sustainable innovation barriers are quite identical to CI barriers (Guldmann and Huulgaard, 2020). Tura et al. (2019) defined six categories of CE barriers, based on existing literature. These categories and the belonging barriers are mentioned in Table 3.

Table 3: Framework of CE barriers (adjusted from Tura et al., 2019).

Categories	Barriers
Economic	• High costs and lack of financial capability and support • Lack of tools and methods to measure (long-term) benefits of CE projects.
Social	• Lack of social awareness and uncertainty of consumer responsiveness and demand • Lack of market mechanisms for recovery • Lack of clear incentives.
Political and institutional	• Complex and overlapping regulation • Lack of governmental support • Lack of CE know-how of political decision-makers.
Technological and informational	• Lack of information and knowledge • Lack of technologies and technical skills
Supply chain	• Lack of network support and partners • Strong industrial focus on linear models • Lack of collaboration and resources
Organisational factors.	• Incompatibility with existing (linear) operations and development targets • Silo thinking and fear of risks • Conflicts with existing business culture and lack of internal cooperation • Heavy organisational hierarchy and lack of management support • Lack of CE knowledge and skills

Besides these general categories of CI barriers, not much literature was found on the topic. For this research, CI barriers are defined as: '*factors that are of disadvantage to the CI practices of SMEs'*.

2.4 Government incentives for circular innovation

Firms often face capital constraints, especially in the early stage of sustainable product development, due to the high investment costs of R&D (which is necessary for innovation) and production equipment (Tsao et al., 2017). This R&D investment is associated with plenty of risks and a high possibility of failure (Dimos and Pugh, 2016; Ehie and Olibe, 2010). To fight this, governments have adopted subsidy policies and financial and fiscal arrangements that alleviate funding pressure and stimulate sustainable product development and consumption (Hall, 2000). Producer incentives include grants, low-interest loans, direct payments, tax exemptions, credit subsidies, government guarantees for procurement

contracts and research subsidies (UNEP, 2003; Whitley, 2013). For this research, all of these are included in the concept of GIs. Tax policies are frequently used to encourage or discourage certain activities (Hines and Park, 2019). In the scope of this study, this means that GIs are intended to promote CI practices while discouraging environmental unfriendly ones. Huergo and Moreno (2017) add that these aid programmes certify organisations, which reduces information asymmetries and helps them to face financial difficulties. Within the Netherlands, around 35% of innovative firms received public subsidies for R&D between 2008 and 2010 (OECD, 2013, as cited in Dimos and Pugh, 2016).

In literature, there is, however, a debate on the actual effectiveness of these incentives (Banai et al., 2019). Research states that, on the one hand, subsidies have been proven to facilitate R&D alliances (Grilli and Murtinu, 2018; Chapman et al., 2018) and can help to build strong financial portfolios (Zhang and Xu, 2018). It decreases the likelihood of firm exit (Zhang and Xu, 2018), and in some cases (but definitely not all) even positively affects the operating profit (Meuleman and De Maeseneire, 2012; Xu et al., 2020).

Moreover, the obtainment of external capital can ease the risk and expense of possible market failure and can improve expected profits from R&D (Dimos and Pugh, 2016). Often the output process of an R&D investment is enhanced through the support of government subsidies (Tsai and Liao, 2016). Lastly, government subsidies have a signalling effect that shows the high quality of the SME, which relates to financial protection by the government (Yan and Li, 2018). It stresses SME quality (e.g. by ligitimising them), which allows them to access long term external financing in the future (Meuleman and De Maeseneire, 2012

On the other hand, while the direct effect of subsidies is often positive, adverse effects can also be found. Subsidizing firms has, for example, a negative impact on the export propensity of non-subsidized firms, which possibly decreases the overall impact of all firms combined (Girma et al., 2020). Furthermore, government subsidies have a negative effect on firm's investment efficiency (the over- or underinvestment in projects) (Hu et al., 2019), and no effects of subsidies on labour productivity were found (Meuleman and De Maeseneire, 2012). This means that labour productivity does not necessarily improve.

2.4.1 Accessing and managing government incentives

Although barely any research was found about accessing and managing GIs, Cambridge Dictionary (2020) defines accessing as: *''to be able to use or obtain something such as a service''*. In the scope of this study, this means that accessing GIs means that SMEs can obtain the actual incentive. Therefore, the definition used in this research is: *"to be able to use or obtain GIs''.* Managing is defined as: ''*the control and organisation of something''* (Cambridge Dictionary, 2020), in which the 'something' is the

obtained government incentive. Therefore, the definition used in this research is: *"the control and organisation of obtained GIs".* This means that the requirements belonging to the incentive are met and that the finance is controlled, organized and used for the correct purposes.

These definitions are still quite vague and require a more profound understanding. Unfortunately, no research was found, meaning that the following description is not backed up by literature. The complete process of acquiring GIs involves both the obtainment and management of incentives. For this research, the obtainment is the moment in the process when organisations apply for an incentive up until the decision whether the application has been accepted or not. The management of incentives happens after the application has been successful, and the organisation has obtained the incentive.

2.4.2 Experienced barriers when accessing and managing government incentives

Unfortunately, no research was found regarding experienced barriers when accessing and managing GIs meant for innovation, certainly not for CI. One study, by Shlay et al. (2004), was found that looked into barriers to subsidies: why low-income families do not use child care subsidies. Although the topic of this research has nothing to do with CI, these barriers will be used as a starting point. According to Shlay et al. (2004), the barriers that low-income families experienced regarding subsidies for child-care are: families believed that they were ineligible for subsidies, families did not know about child care subsidies at all, families did not believe they needed help with paying for care, confusion and misinformation about subsidy regulations, the hassle associated with access to the system and re-certification process, the idea that subsidy use would interfere with their choice of care and the stigma related perceptions of child care subsidies.

Table 4: Translation of barriers as defined by Shlay et al. (2004)

Barriers as defined by Shlay (2004)	**Barriers to CI incentives**
1. Families believed that they were ineligible for subsidies	1. SMEs believe they are ineligible for incentives for CI
2. Families did not know about child care subsidies at all	2. SMEs are not aware of incentives for CI
3. Families did not believe they needed help with paying for care	3. SMEs do not believe they need help paying for CIs
4. Confusion and misinformation about subsidy regulations	4. Confusion and misinformation about circular incentive regulations
5. The hassle associated with access to the system and re-certification process	5. The (administrative) hassle associated with access to the CI incentive and the management of the CI incentive
6. The idea that subsidy use would interfere with choice of care	6. The idea that use of the incentive interferes with SMEs choice of CI practices
7. Stigma related perceptions of child care subsidies	7. Stigma related perceptions of CI incentives
	8. The process of obtaining a government incentive for CI takes up too long by which the market opportunity can be gone

Meijer et al. (2019) and Cecere et al. (2018) mention in their research that administrative burden is one of the barriers organisations experience when obtaining GIs. This relates to the hassle associated with

access to the system and the re-certification process. Furthermore, Meijer et al. (2019) mentioned that the process of applying for GIs is often time-consuming and that the obtainment of GIs is a long road that can easily take up to one and a half year, by which the market opportunity can be gone, which can be a barrier as well. The barriers as distinguished by Shlay et al. (2004) were translated to the context of CI. The results of this combined with the additional barriers as mentioned can be found in Table 4.

2.5 Conceptual framework

Existing research found that there are many perceived barriers for sustainable and CI, of which accessing and managing GIs is one. However, no study has looked further than this and has tried to explore what these barriers entail precisely. Antecedents have not yet been researched, nor has the relationship between concepts. Therefore, the conceptual model of this research was created, and is shown in Figure 1. As this research is very much explorative and relations are unclear, arrows and concept borders have been made dotted. The barriers are based on the barriers mentioned by Shlay et al. (2004), Meijer et al. (2019) and Cecere et al. (2018).

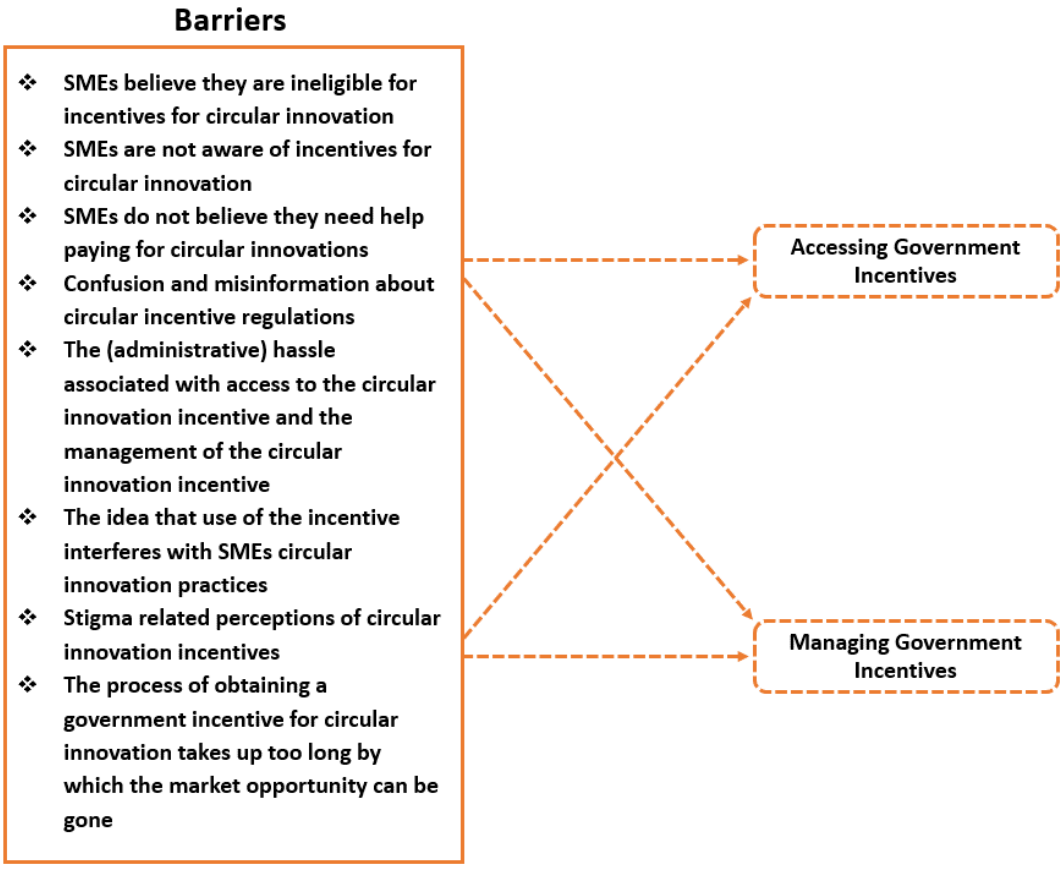

***Figure 1**: Conceptual Model*

Chapter 3. Methods

This chapter will outline the methodology of this research. It describes the research design and accompanying operationalisation. Furthermore, it will describe which methods were used to collect the data and how the collected data were analysed. A detailed description of this is necessary to ensure confirmability (Symon and Casell, 2012). Lastly, it describes the cases used for this study, including the selection criteria, and shows how research ethics were ensured.

3.1 Research design

This research makes use of a qualitative case study approach to study which barriers managers of Dutch SMEs experience throughout the process of obtaining subsidies for their CI practices. Qualitative research is suitable for investigating multiple causality (Symon and Casell, 2012), such as numerous barriers. It is also suitable for describing how several causes of a phenomenon are linked (Symon and Casell, 2012), meaning that the relation between barriers will be researched. It allows for exploration of detail and in-depth research (Curtis et al., 2000), which is necessary to obtain more information about the barriers and their underlying issues.

There are multiple reasons why a qualitative approach was used over a quantitative approach. First of all, this study is very much explorative. As both Creswell (2003) and Yin (2012) state, in exploratory research, qualitative research precedes quantitative research. Sarantakos (2005) states that exploratory studies are used to generate new ideas and opinions that could help to operationalise essential concepts in the study, and thus qualitative research is advised. Quantitative research usually starts with a specific theory and tests hypotheses that accompany this theory (Holton and Burnett, 2005). However, as barely any theory was found, this research is theory building rather than theory testing.

Furthermore, the complexity of this study asks for qualitative research rather than a quantitative one. Peshkin (1993) describes that studies about people, events and situations are characterized by more variables than anyone can identify, and thus qualitative research is preferred. This study relates to all three of the described factors: people (managers within organisations), events (the process of accessing and managing GIs) and situations (the barriers when obtaining GIs). Lastly, while quantitative research methods are particularly strong when studying large groups (Swanson and Holton, 2005), this study aims to look at a few organisations and thoroughly investigate these. Therefore, a qualitative approach was more appropriate in this case.

One of the most used qualitative research methodologies is a case study (Yazan, 2015). The choice to use a case study approach was made because this allows for a practical type of research in which a social phenomenon can be studied in its natural context (Creswell, 2013). As the goal of this research is to gain

insight into several barriers, it was essential to see these barriers in the natural context of the SMEs. Furthermore, a case study is interested in giving detailed descriptions of phenomena that occur in specific cases (Swanborn, 2010). As the aim of this study was to look for barriers, it was necessary to study these in the most detailed way possible. Case studies emphasize subjective experiences and the meanings they have for an individual (Starman, 2013), which is essential considering this study investigates managers, and thus people. To increase the transferability of the results, the decision was made to use a multiple case study approach over a single case study (as suggested by Yin, 2009). Also Symon and Casell (2012) state that transferability is ensured by using multiple cases and by providing enough detail about these specific cases. In this way, results can be used for similar contexts.

3.2 Operationalisation

As this study deals with subjective meanings, it is crucial to operationalise the main concepts used for this study. The study deals with five constructs: circular innovation, government incentives obtained, use of government incentives, experienced barriers when accessing government incentives and experienced barriers when managing government incentives. Furthermore, some control variables were taken into account. All concepts have extensively been discussed in Chapter 2, but an overview of the concepts relevant to this study is presented below. Results are also summarized and further explained in Table A2 in Appendix 2.

Circular product innovation

The dimensions innovation, product innovation, sustainable innovation and CI, micro-level, micro-level methods and micro-level categories/practices were combined to measure circular product innovation. Innovation refers to the changes, invention and novelty aspects of refined products (Based on Chandy and Tellis, 1998; Edwards-Schachter, 2018; and Schumpeter, 1934). The type of innovation, used for this study, is product innovation. The reason for this is that only manufacturers have been researched. Product innovation means that actual changes to the physical product have been made (Kim and Mauborgne, 2004). As CI is an aspect of sustainable innovation, it was essential to take this into account as well. Sustainable innovation includes a purpose and direction of environmental and social considerations (Bos-Brouwers, 2009). CI combines all of the above and maximizes the value of material resources while minimizing overall resource use, gas emissions, waste and pollution (Based on Geissdoerfer et al., 2017). This study measures CI at the micro-level, where circular models are implemented by individual actors (de Jesus et al., 2018). Examples of methods and categories/practices used at the micro-level are Cleaner production, New business model, Selling services instead of products, Eco-design, De-materialisation (de Jesus et al., 2018), Recycling, Remanufacturing, Reuse, Resource-efficiency, Disassembly, Lifetime extension, Waste management, End-of-life management and Multidimensional indicators (Kristensen and Mosgaard, 2020).

Government incentives obtained

The dimensions process of obtaining GIs and types of GIs were combined to measure GIs obtained. No literature was found regarding the process of obtaining GIs. Therefore, interviews will give an insight into the process of obtaining government incentives. for CI. UNEP (2003) and Whitley (2013) state that government incentives can exist of grants, low-interest loans, direct payments, tax exemptions, credit subsidies, government guarantees for procurement contracts and research subsidies. The types of GIs obtained were measured through the questions: which government incentives are available for CI? And which GIs did organisation obtain?

Use of government incentives

The use of government incentives is measured through the dimensions accessing and managing. Accessing GIs was measured by looking at whether an SME was able to use a government incentive (based on Cambridge Dictionary, 2020). It and looks at the process where SMEs gather information about GIs for CI, up until the decision if the application has been accepted or not. This was measured through interviews with SMEs and experts. Furthermore, it measures the number of government incentives an organisation has applied for (based on Bishop, 1998), but not necessarily obtained. Managing GIs measures the control and organisation of GIs (based on the Cambridge Dictionary, 2020). It looks at the process after the application for the incentive turns out to be successful, when the organisation has obtained the incentive. This means that the requirements belonging to the incentive are met and that the finance is controlled, organised and used for the correct purposes. The process and requirements for managing incentives were unclear and were measured through interviews with SMEs and experts. Managing government incentives is also measured through the number of government incentives actually obtained.

Experienced barriers when accessing government incentives

The possible barriers, as discussed in Chapter 2, are divided between accessing and managing incentives. The dimensions barrier, expected eligibility, information available, necessity of incentive, administrative hassle associated with accessing incentives, time involved and other (based on Shlay, 2004; Meijer et al., 2019; Cecere et al.,2018) were combined to measure experienced barriers when accessing GIs. A barrier is described with words like ‘disadvantage’, ‘constraint’, ‘lack of’ and ‘prevents’ (Freel, 2012; Fisher, 1979). Experiencing barriers when accessing government incentive, therefore, means that something is preventing the SME from accessing, thus obtaining, the incentive. The barrier other was included as this research is explorative, so new barriers might arise from the interviews with SMEs and experts.

Experienced barriers when managing government incentives

The dimensions barrier, administrative hassle associated with the management of the incentive, stigma related perceptions and other (based on Shlay, 2004; Meijer et al., 2019; Cecere et al.,2018) were combined to measure experienced barriers when managing GIs. A barrier is described with words like 'disadvantage', 'constraint', 'lack of' and 'prevents' (Freel, 2012; Fisher, 1979). Experiencing barriers when managing government incentive, therefore, means that something is preventing the SME from managing the incentive correctly. The barrier other was included as this research is explorative, so new barriers might arise from the interviews with SMEs and experts.

Control variables

For this research, the variables that will be controlled for are: organisational size, industry type, and successfulness of obtaining GIs. According to the OECD (2005), an SME exists of a maximum of 250 employees. Furthermore, the manufacturing industry exists of several other industries. The type of industry that cases are operating in will be taken into account. Lastly, organisations who successfully obtained government incentives might experience different barriers than organisations who were unsuccessful. This will therefore also be taken into account.

3.3 Case selection

This research is based on semi-structured interviews, with managers of SMEs. These managers are involved in obtaining GIs for CI. To ensure credibility, triangulation of data was used, as advised by Symon and Casell (2012). This means that additional data from sources such as websites were analysed as well. In total, five interviews were conducted at four SMEs. Ideally, two informants per case would have been interviewed as this supports credibility. However, in most cases, the organisations were rather small and/or only one manager had been involved in the process of obtaining GIs. In that case, only one informant per case was interviewed. Only at Paper pack, two informants were interviewed. At Plastic pack two informants were supposed to be interviewed, but unfortunately, one got cancelled at the last minute and there was not enough time to reschedule the interview to a later moment in time. Furthermore, at SusVal and Boonstoppel, two expert informants were interviewed; so four in total. An overview of the number of informants used and the role of the informant in the organisation is shown in Table 5.

Unfortunately, this research was carried out during the 2020 COVID-19 outbreak, which caused time to be more limited than it already was. It also came with other restraints, such as social distancing, making it more challenging to research more cases. The COVID-19 crisis pushed the created planning for this research quite a bit. This means that interviews were done in a period that included holidays, such as the Dutch 'Kingsday' and the May holiday. This made it even more challenging to research more cases as managers were often not available for an interview during the holidays.

Table 5: informants per organisation

Anonymized organisation	Role within the organisation	Informant code
1. Plastic pack	Director Innovation & Development	Plastic 1
2. Paper pack	CEO	Paper 1
	Controller	Paper 2
3. Bio pack	Founder/CEO	Bio 1
4. KnitCo	CEO/Owner	KnitCo 1
5. SusVal	CEO	SusVal 1
	Program manager	SusVal 2
6. Boonstoppel	Innovation Consultant	Boonstoppel 1
	Innovation Consultant	Boonstoppel 2

The cases were selected in a way that variance was both minimized and maximized. Yet, as not much was known about the researched barriers, the ultimate goal was to minimalize the variation between cases. This means that the choice was made to use a relatively homogenous group of cases. Cases were similar in a way that they were all SMEs working with CI, operating in the manufacturing industry. Still, a variance was sought on some aspects. Most cases were operating in the packaging industry, with one exception: KnitCo. The number of employees differs per case, although SMEs cannot exceed the number of 250 employees. During the interview with Plastic pack, it became apparent that they exceed this number. Therefore, this case was used to compare the other cases to. This provided insight into the differences and similarities of smaller and larger organisations. Table 6 shows which cases were selected and what the selection criteria for each case were.

Table 6: selected cases and selection criteria per case

Organisation	Plastic pack	Paper pack	Bio pack	KnitCo
Industry	Packaging	Packaging	Packaging	Clothing
Description	Sustainable plastic packaging	Carton packaging	Sustainable packaging	Clothing and lifestyle products for babies and baby rooms
Employees	>250	70	9	15
CI practices	Bio-plastics. Multiple products regarding alternatives for caps, closures, lids, etc.	End of life cycle food packaging; use of recycled material; creation of products that are recyclable after use	Creation of compostable foil; bioplastics	Baby clothing and lifestyle products from used/recycled material; cradle-to-cradle line
Government incentive	WBSO, EIA	WBSO, SLIM, Praktijkleren, MIT	WBSO, European projects	WBSO, prepare to start, branch projects
Successfulness of obtaining government incentive	Yes	WBSO, MIT & Praktijkleren: Yes SLIM: No	Yes	Yes

Selection criteria

Cases were selected based on the following selection criteria: case organisations consisted of less than 250 employees to match SME criterium (except for Plastic pack), cases were all operating in the

manufacturing industry, cases were involved in some type of CI practice, cases had at least tried to obtain a government incentive for their CI practices, and cases were available for an interview in the period that the study was carried out.

Plastic pack

Plastic pack is an innovative plastic packaging manufacturer. Their innovations include caps and closers, roll-ons and stick and jars and bottles. They create packages for the personal care, food and beverage and home care markets. Plastic pack employs over 250 people within the Netherlands, and successfully obtained the WBSO.

Paper pack

Paper pack creates packages out of carton. This means that they try to find sustainable solutions for plastic use. Innovations include, for example, the creation of a carton package in which cherry tomatoes can be sold. They are involved in several circular practices, such as the use of recycled carton. Paper pack employs around 70 people and has successfully obtained WBSO, SLIM and praktijkleren incentives, but has been unsuccessfully regarding the SLIM incentive.

Bio pack

Bio pack is an organisation involved in sustainable packages, made from bioplastic. Over the last ten years, they have been innovating in order to create better sustainable packaging solutions. Their innovations include compostable potato chips bags and compostable foils. Bio pack employs around nine people and has successfully obtained WBSO, and some European subsidy projects.

KnitCo

KnitCo is a family company that has been operating in the knitting industry for the past 30 years. They are one of the biggest lifestyle brands for babies. Their innovations include baby products, knitted from used jeans. They employ around 15 people and have successfully obtained WBSO, prepare to start and some subsidy projects organised by their branch organisation. However, KnitCo is the only organisation that is no longer using government incentives.

Extra organisations – expert interviews

Boonstoppel Subsidie Advies B.V.

Boonstoppel is a subsidy consultancy firm, located in Druten. They assist SMEs with the obtainment of GIs. They mainly focus on innovative organisations and sustainability. Before the other interviews were held, a manager from Boonstoppel provided an overview of possible barriers via e-mail. This list can be found in Appendix 3. These barriers were incorporated into the interviews with managers of SMEs to test whether or not they were experienced. Furthermore, interviews were held with employees from

Boonstoppel to get acquainted with the types of GIs available, and the process of obtaining these incentives.

SusVal

SusVal is a community for organisations operating in, or wanting to operate in the CE. They focus on organisations located in the eastern part of the Netherlands and assist them with anything they might need. Two experts, working at SusVal, were interviewed to gain an insight into possible barriers. These experts were also used to check the list provided by the manager from Boonstoppel. These results can be found in Appendix 3. The barriers were critically analysed and compared with the results of the interviews with SMEs before incorporating them into the results section.

3.4 Data collection

For this research, several interviews were held. As this research was done during the COVID-19 crisis, all interviews were held via Skype, as it was not possible nor allowed, to meet managers in person. Not doing interviews in person has some adverse side effects. Some informants did not have a webcam available during the interview. This made it impossible to read body language (which can tell a lot). Even if interviews included imaging, reading body language was still more difficult. In an ideal scenario, the interviews would have been held in real life, but unfortunately, this was not possible.

The interviews were semi-structured, meaning that a question list was created, leaving enough space for new input. Semi-structured interviews give more detailed information as it tries to explain the phenomenon from the position of the participants (Sofaer, 1999). This can result in new, valuable perspectives (Symon and Cassell, 2012). Yin (2017) also mentions that open-ended research questions lead to the use of an explanation-building technique, which involves thorough explanations. Before these interviews were conducted, a list of possible experienced barriers was accessed. These potential barriers were described by one of the managers of Boonstoppel and can be found in Appendix 3. This list was also checked and extended during the expert interview with SusVal. This list, together with the literature from Chapter 2 was input for the case interviews, and ensured that all relevant topics were addressed.

Based on the advice Miller et al. (1997) and Huber and Power (1985) give for retrospective studies, participants were asked first to provide a general overview of their business and the CI they are involved in. After they were asked to describe the barriers that they experienced. The interviews were all in Dutch, the mother language of all participants. An overview of the question lists for the different types of interviews can be found in Appendix 4. The first interviews focused more on the experienced barriers. During these interviews it became apparent that the role of the intermediary was an important aspect. The final interviews, with Plastic 1 and Paper 2, were therefore more focused on gaining an insight into the role of the intermediary.

This research uses a protocol to guide data collection, preserves a chain of evidence and triangulates data from different sources, as suggested by Yin (2012). To ensure credibility, this research follows the advice of Symon and Casell (2012) and makes use of member checking, and progressive subjectivity (through a research diary). To ensure dependability, it is essential to describe the research process in detail. The process was also described in the research diary, which can be found in Appendix 5.

3.5 Data analysis

The interviews were recorded and transcribed verbatim. These transcripts can be found in Appendix 6. After, they were sent to the participants in order to check with them if the interviews were perceived in the correct way and if they agreed with everything they said. This peer debriefing was used to ensure credibility (Symon and Casell, 2012). The interviews were analysed one by one (as suggested by Miles and Huberman, 1994) and then compared, to identify common patterns (as suggested by Yin, 2017). To analyse the data and compare patterns, a template analysis was used. The decision for a template analysis was made because it balances both flexibility and structure. King and Brooks (2017) describe the steps that were followed, which can be found in Appendix 7. Some a priori themes, as used for Figure 1: Conceptual Model, were defined. Most of the analysis was, however, based on unpredicted patterns. The outcome of interest, the perceived barriers when obtaining CI incentives, had already happened at the time of researching. Therefore, the aim was to build an explanation for these barriers. The template analysis carried out can be found in Appendix 7. This includes an insight into the coding process, the process of clustering codes, and the templates produced. An insight into the template changes is provided as well. When writing the results, quotes were translated from Dutch to English. These quotes can be found in Appendix 8.

3.6 Research ethics

Symon and Cassell (2012) state that it is essential to handle data sensitively when doing qualitative research. For this study, several ways to ensure that research ethics have been taken into account. Firstly, permission was asked for conducting research at the involved organisations, and participants were asked whether they agreed to participate in the study voluntarily. Permission was also asked for recording the interview. To ensure the privacy of the informants, all participants and organisations were mentioned anonymously, through fictional names. Transcripts included every pronunciation of the informant so that hesitations were made clear and the transcripts were a literal version of the interview. Lastly, the interview transcripts were sent back to participants so that they had the opportunity to further explain the meaning of things they said, or even withdraw statements.

Chapter 4. Results

In this chapter, the results of both the expert interviews and case studies are discussed. The results will be discussed according to the template analysis, which can be found in Appendix 6.

4.1 Government incentives for circular innovation

Expert interviews with two innovation consultants working at Boonstoppel were used to gain an understanding of the existing GIs for CI. According to both Boonstoppel consultants, incentives for CI are equal to incentives for regular innovation. Table 7 shows an overview of the existing innovation incentives relevant for product innovation.

Table 7: innovation incentives available

Innovation incentive	Type of incentive	Explanation	Source
WBSO	Fiscal arrangement	Organisations who are involved in R&D projects have to pay less income tax. An advantage of around 35%.	Interview informants Boonstoppel/RVO (2020)
MIT: Feasibility study	Subsidy	To research technological and economic risks of an innovation project. A maximum of €20.000 (50% of eligible costs)	Interview informants Boonstoppel/RVO (2020)
MIT: knowledge voucher	Subsidy	Voucher specifically meant for SMEs, to have their innovation question researched by an external organisation. Maximum of €3.750 (40% of total costs)	RVO (2020)
MIT: R&D collaboration	Subsidy	The collaboration of multiple SMEs who together develop products, processes or services. The small subsidy is between €50.000 and €200.000 and the big subsidy is between €200.000 and €350.000, to be divided between organisations (35% of eligible costs)	RVO (2020)
Innovation credit	Loan	Organisations involved in new product development or clinical development can obtain a loan. The maximum for product development is €10 million. For clinical development, the maximum is €5 million	RVO (2020)
INTERREG (only partly within the scope of this research; European incentive, not national)	Subsidy	For organisations, researchers and governments to collaborate in sustainable projects, on an international level. Several levels, but for level A (BE-NL) alone the Dutch government received a total of €309 million for a period of 6 years	Interview informants Boonstoppel/ RVO (2020)

Both consultants named the WBSO and the MIT: Feasibility study as the most common examples of innovation incentives. According to both Boonstoppel consultants, no incentives are available for CI specifically. However, as sustainability is currently an important topic, organisations who incorporate this in their innovation can often score extra points when the application is reviewed. One Boonstoppel consultant states: *''so that [WBSO] is in general facilitating innovation projects. Not necessarily*

circular projects, although they are included in this'' (Boonstoppel 2). The WBSO looks at all innovation activities of an organisation together. The controller of paper pack, who is involved in the administrative operations, states: *''per topic, you have several hours per year, and the goal is to have matched the total amount of hours by the end of the year. And which one it is exactly… for example, if you don't match the number of hours for one topic, but you have too many hours at another topic… it is about the total of that year. If we ask for a thousand hours per year and we have 1100 in the end with all our projects combined it is fine''* (Paper 2).

According to one consultant from Boonstoppel, some incentives are meant explicitly for the CE: *''there are other opportunities. For example, the other day a subsidy arrangement for circular chains was established''* (Boonstoppel 2). However, this incentive looks at the complete supply chain and consortiums, which is not the micro-level that this research focuses on. Boonstoppel 2 further describes that there is a difference between incentives for innovation and incentives for investments. From the interviews and the website of the RVO, it became clear that there are many incentives for organisations that want to invest in sustainable materials or that want to upgrade their factory in a way that less energy is needed. These investment incentives are also less relevant to this research. This means that the incentives used for this research are general innovation incentives. From the interviews, it appeared that it was, therefore, more difficult for the researched SMEs to differentiate between incentives for regular innovation and incentives for CI, as the process and thus the barriers were the same.

4.1.1 The process of obtaining government incentives for circular innovation

The process of obtaining GIs was divided into several steps, based on expert interviews with consultants from Boonstoppel. As the firm interviews highlighted the importance of the intermediary, the role of the intermediary and the role of the SME will be taken into account at every step. Table A3 in Appendix 9 visualizes the process of obtaining GIs.

Obtaining information about government incentives

All firm informants researched state that they use an intermediary to obtain information about GIs and merely have to provide information about the activities they are (planning on) carrying out. According to both Boonstoppel consultants, the required information for the process of obtaining GIs is often knowledge that the intermediary already has: *''many of the subsidy arrangements have been existing for years, so to study and fully understand all ins and outs of the essential national incentives kind of belongs to the work training process''* (Boonstoppel 1). Boonstoppel 1 states that it is also possible that the intermediary does not immediately know which incentive matches the information provided by the managers of an organisation. In that case, they can search for additional information. Boonstoppel consultants obtain this information through subsidy news providers or websites from government bodies responsible for GIs. According to Boonstoppel, it is also possible that intermediaries have an a priori

idea about which incentive matches the information provided by the SME, but need to search for specific requirements or additional information to judge whether the incentives matches the project. In summary: *''so we know where to search and often it is based on knowledge and experience that we already possess''* (Boonstoppel 1). In this step, the intermediary provides the required information based on what matches the SME's innovation activities: *''we do that based on an interview [with the manager of the SME] (...). So you check what the purpose of the innovation is or how does it work, what does it exist of, which components, how do you go about it, what is the process''* (Boonstoppel 2).

Go/no-go decision

Boonstoppel 1 mentions that based on the information provided by the manager of the SME, the intermediary judges if a project is worth the effort. Boonstoppel 1 explains that this decision is based on whether the project matches the incentive requirements. The intermediary also makes a financial consideration: *''if it is only a few thousand euros, yeah often the effort that you have to put in does not outweigh the incentive that you receive''* (Boonstoppel 1). Boonstoppel 1 elaborates that this does include not only the effort that the intermediary has to put in, but also the effort that an SME will have to put it after the incentive has been obtained, such as additional reports that have to be written. Furthermore, from the expert interview with Boonstoppel 1, it became apparent that the intermediary judges the feasibility in regards to time, such as deadlines. Lastly, the intermediary looks at possible technical difficulties such as the willingness of project partners.

Administrative requirements

From both expert interviews, it appeared that once a go decision is made, the intermediary writes the project plan and arranges the necessary documents: *''that information, we transfer that to a concept version… of a subsidy application''* (Boonstoppel 2). Both Boonstoppel consultants state that the manager of the SME provides the required information and reviews the parts written by the intermediary. Sometimes the manager writes along: *''sometimes, there are clients that insist on writing parts of the plan themselves (...). Sometimes when it is not possible, time-wise, because they come up with things last minute (...). Then they simply have to write a part of the project plan themselves''* (Boonstoppel 1). Both consultants, however, state that generally the role of the manager of the SME is to only provide information and review the project plan.

Finish application

Both Boonstoppel consultants explain that once the project plan is finished and reviewed by the client, the intermediary submits the application, including the necessary additional documents. The government or subsidy provider reviews the application while the manager of the SME and intermediary wait for the decision. If the government has questions about the project plan or proposal, the intermediary will try to

answer these questions. Sometimes they need additional information from the manager of the SME to do so. The intermediary updates the manager and discusses the process with them.

Go/no-go decision

Both Boonstoppel consultants state that the government or subsidy provider decides on the proposed incentive project. If the application or proposal is granted, it means that the SME will receive the incentive. If the application or proposal is rejected, the intermediary can lodge a written appeal of objection. However, according to Boonstoppel 1, they will only do this in the case they think they stand a chance at winning the procedure.

Managing government incentive

From both interviews, it appeared that once the approval has been formalised in a decision and the incentive has been obtained, the SME receives the money. Both Boonstoppel consultants explain that sometimes SMEs receive the incentive in advance, occasionally the SME receives the incentive in several parts. According to Boonstoppel 1, this depends on the type of incentive and the amount of money involved. Then, the managers of the SME will always have to meet the administrative requirements of the incentive: *''and you don't get an incentive without keeping track of the administration, so it is essential to discuss right from the start how the SME will have to go about it and what they have to do if they have any questions''* (Boonstoppel 2). The intermediary is unable to do this for them: *''we check if we can start the project administration together, but we are not able to do it for them. They will have to administrate the required documents themselves. We can provide them with some tools, how they can arrange it, keeping track of the administration''* (Boonstoppel 1). The consultants from Boonstoppel provide the manager of the SME with a guideline for the specific incentive. Boonstoppel 2 states that sometimes the government audits the administration. There are roughly two forms of audits: standard audits and investigations. Routine audits are at random, while investigations are performed when the government or subsidy provider has considerable concerns about the integrity of the organisation or project and expects to find irregularities. All contact goes through the intermediary, and the intermediary can prepare the manager of the SME for an audit or inspection. Lastly, some incentives require interim reports to be written during the project. The intermediary writes these reports for the SME.

Finishing the government incentive project

Both Boonstoppel consultants state that after the project is completed, the intermediary writes the final report. The manager of the SME provides the required information such as the timesheets and technical documents. The government judges this report and decides whether the SME will receive the amount of money that is left. The intermediary stays involved until the final amount of money is provided.

4.2 Circular innovation

CI exists of the CI practices carried out by the researched firms and the motivation to participate in CI.

4.2.1 Circular innovation practices

From their website and the interview, it appeared that Bio pack develops and produces exclusively sustainable packaging solutions that are either compostable according to the European norm, or bio-based. This means that their packaging solutions are recyclable and/or biologically degradable, and thus circular. The CEO and owner of Bio pack explains that to produce these packages, they work with bioplastics. To the CEO, innovation is: *"changing an existing product into a more sustainable product. And sustainable, in our opinion, is made from renewable resources, as little impact on the environment as possible and where possible and whenever it adds value compostable''* (Bio 1). This implies that all of their innovations are CIs.

From Paper pack's website and the interviews with their CEO and controller, it appears that they create packages out of carton. The CEO of Paper pack mentions that they do not see themself as a carton packaging supplier or developer, but more as an: *"employment firm with people and machines, that provides solutions for when people lack production capacity because of machine failure or because they don't have the proper machinery available''* (Informant 1). From the interviews, it appeared that they don't develop new products but are merely a service provider. Both informants state that they founded a sister firm called CreaPer, located at the same location, operating in the same group. Informant 1 is the owner of this firm as well, and informant 2 does the administration for CreaPer. Both informants state that this sister firm does develop new, innovative packaging solutions made from carton. CreaPer works together with a freelance product designer and develops products like a drinking cup made out of carton and a plastic bag, that consumers can separate so that the cup is 100% recyclable. Furthermore, they have developed a strawberry container made out of carton that includes specific mechanisms so that the strawberries do not get bruised. Their CI practices are mainly focussed on the recycling of their products.

The CEO of KnitCo states that their firm uses recycled yarn that has been produced by another firm, which they use for products like blankets. The CEO states that they have developed a cradle to cradle line, for which they use ecologically responsible products, meaning: *"so everything that is regenerated''* (KnitCo 1). The interview showed that they aim for local, European production for their products. However, circularity does not seem to be one of their priorities: *"I am honest, at this moment in time it has stopped due to corona. Because everything is closed and you don't really have the time for it. You have to focus on other things''* (KnitCo 1).

The last firm researched is Plastic pack. This is the only firm that is still involved in regular plastic packages. According to their innovation and development manager, this means that they are very much affected by the current public opinion about plastic: *"when you look back a year, before we were busy with corona, you saw a lot about the plastic soup in the news, the pollution due to plastic. And you can imagine that for our branch, the plastics processing industry, that was an annoying period. That doesn't mean that those themes aren't rightfully mentioned on the agenda''* (Plastic 1). Their innovation and development manager states that they've been looking into the use of biobased materials and recycled plastics, but in reality, this is only a small part of their business. During the interview, it appeared that with regular plastic, they are focussing more on using less material, making the product lighter. Furthermore, the informant showed some innovations that make it easier to recycle the products and that make sure that less plastic gets lost. Examples of this are that they created an innovative lid. The seal that proves first-time use gets stuck in the lid instead of customers pealing it off and then losing the small part of the plastic. They also created a cap that includes specific seams. If customers use a knife on this seam, the lid will burst, making it easier to separate the plastic cap from the rest of the product.

Table 8 shows a summary of circular practices for each firm researched

Table 8: circular practice per researched firm

Firm	Practices based on literature	Examples
Bio pack	Recycling; resource-efficiency; waste management; end-of-life management	Packages made out of bio plastics; recyclable and/or biologically degradable packages.
Paper pack & CreaPer	Recycling; reuse; waste management; end-of-life management	Recyclable drinking cup made out of carton; new carton strawberry container containing a specific mechanism that does not bruise the fruit
KnitCo	Recycling; end-of-life management	Products made out of recycled yarn
Plastic pack	Recycling; reuse; resource-efficiency; lifetime extension; waste management; end-of-life management	Biobased/recycled plastics; using less material; plastic that can easily be separated from the rest of the product, making it easier to recycle; mechanisms that make sure no plastic falls off and gets lost; plastic that can be used several times

4.2.2 Motivation to participate in circular innovation

During the interviews, it became apparent that all firm's researched have a different motivation to participate in circular innovation. Table 9 provides an overview of motivation per researched firm.

Table 9: motivation to participate in circular innovation

Firm	Motivation
Bio pack	Internal; Founder's personal feelings towards environmental problems
Paper pack; CreaPer	External; Business opportunity
KnitCo	External; Business opportunity
Plastic pack	Internal and external; customer demand; manager's personal feelings

Bio 1 mentions that the motivation to work sustainably is very much personal. During the interview, it became apparent that the firm was founded because of the owner's personal feelings towards environmental problems. According to the owner, it goes further than motivation only: *"it even goes further. It really is a way of life''* (Bio 1). The owner of Bio pack mentions that everyone working at their firm becomes infected by their sustainability attitude, meaning that the motivation to work sustainably is interwoven throughout the entire firm. However, this might also be because the owner selects people in that way. This, unfortunately, wasn't specified during the interview.

The interview with Paper 1, CEO of Paper pack, showed that circularity, to him, is a business opportunity: *"we jump in, in a business way, on a piece of the market for carton. And a piece market antipathy against plastic. (...) we believe that there is a market for innovative carton. That is the underlying thought. That is the main driver''* (Paper 1). When asked whether they also have a motivation based on being responsible or sustainable Paper 1 stated: *"for Paper pack that is not the motivation. For the sister firm, CreaPer, yes. CreaPer presents itself as an anti-plastic firm that is focused on replacing unsustainable packages as much as possible''* (Paper 1). However, as the CEO of both firms is the same person, this implies that this motivation is more about how CreaPer is positioned in the market. Both informants mention that Paper pack does not necessarily have an environmental motivation. Employees are not that interested in sustainability and see working with carton simply as their job. Paper 2 states: *"well I think that especially most people in production just see it as their job. And if they are conscious about the fact that they are working with carton, I don't know. I don't know. And if they are conscious about the environment, I also don't know''* (Paper 2).

Just like Paper pack, KnitCo also appears to have a more economically driven motivation to participate in CI: *"because we, A, believe in it, that that [circularity] is going to be the future. Of course the commerce. We want to be one of the first movers''* (KnitCo 1). As mentioned before, KnitCo 1 explains that as soon as a situation like corona happens, they don't have the time to focus on sustainability anymore. They see that there is increasing market demand for circular solutions: *"so there are for example many, whenever we are at international fairs, then there are many stores, that we used to call 'geitenwollen winkels' (tree-hugging stores/greenies). But nowadays that is not the case anymore, 'geitenwollensokken winkels', they have a demand for it [circularity]. The consumer is slowly becoming more open to it. They want to spend a little more on it. The awareness it there''* (KnitCo 1).

For Plastic pack the motivation to participate in CIs appears to be both external and internal. The innovation and development manager mentions that they mainly develop what their customer needs and that their customers are also more interested in sustainability. They also have an intrinsic motivation: *"at our firm you also find people who are, above average, who do think that you should handle plastic in a sustainable way. In the end, we are for an important part responsible somewhere in the chain, whether*

we want it or not, for that pollution. And that is not why our company was founded. Trying to create good packaging, that protects products, in a smart way. Bringing it to the customer in a good way and in that way allowing the customer to use it in an efficient way…'' (Plastic 1). However, this was stated by the innovation and development manager, who might be a bit biased, as innovation nowadays often includes sustainability, and who does not have an operational job.

4.3 Experienced barriers when accessing government incentives

During the interviews, it became apparent that there is a difference in experienced barriers for accessing GIs and managing them. Most barriers are experienced when accessing a GI. However, this is also the moment that intermediaries are most active and influence the experienced barriers. This implies that firms experience fewer barriers when they use an intermediary. This is illustrated by the following quotes: *"no [we don't experience barriers] because it is neatly arranged by Boonstoppel. We are merely telling our story, about what we are currently doing, and Boonstoppel transfers that to a government incentive application''* (Paper 2), and: *"no that is the advantage right, when you outsource it you don't have that burden''* (Plastic 1).

However, one overlapping theme for all experienced barriers is that firms are simply not that interested in GIs, meaning that they are not willing to put time and effort into this. Informants mentioned that they don't think that the costs outweigh the benefits. With these costs, informants talk about the hassle involved, which implies that they do experience barriers. Bio 1 illustrates the interest of Bio pack in GIs through the following quote: *"and if we then get some subsidy now and then it is a nice bonus, but it is not the main activity of Bio pack. Not even a sub activity. It is more like a sub sub sub SUB activity, that is taken into account last''* (Bio 1). KnitCo 1 states: *"yeah it [GIs] distracts''* (KnitCo 1). KnitCo and Bio pack are relatively small companies. Bio pack has nine employees, while KnitCo only has 15. This might be a reason for the experienced hassle.

Plastic pack, the largest firm of all, is also the firm that feels like they profit most from GIs: *"per year, I think, we have €2.5 ton that we get to our disposal to innovate. And then I am only talking about WBSO. Well, that is a few FTE's''* (Plastic 1). During the interviews, it became apparent that they are also most interested in obtaining government incentives and see this as a higher priority. The reason that the smaller researched firms do get involved in GIs, is that they use an intermediary that somewhat pushes them and does the application for them. Unfortunately, none of the investigated firms was unable to obtain any type of GIs. Paper pack managed to obtain the WBSO and the MIT: Feasibility study. They were unable to obtain some non-innovation incentives. However, the interviews with Paper 1 and Paper 2 showed that this did not affect the barriers that they experience.

4.3.1 Expectations regarding the chance of success

Paper 1 stated during the interview that GIs are sometimes perceived as a lottery: *"then I think, then I would choose to be like okay never mind because you have to put so much time and energy in it and the outcome is often not a victory. Sometimes it is simply a lottery. Then I wouldn't 1,2,3 try to translate the complete process. So the administration''* (Paper 1). This, however, depends on which incentive a firm tries to obtain. According to consultants from Boonstoppel, the WBSO, for example, has a larger success rate than an MIT: Feasibility study. Paper pack is the only firm that has obtained this MIT subsidy, which might be the reason that the informants of Paper pack are the only ones who experience expectations regarding chance as a barrier. All informants stated that they base their expectations regarding chance on the information that their intermediary provides. The intermediary is the one who tells them whether or not they have a chance.

Proposition 1a: *the manager's expectations regarding chance of success is a barrier to access to GIs*
Proposition 1b: *the type of incentive influences the manager's expectations regarding chance of success*

4.3.2 Expectations regarding eligibility

During the expert interview with informants from SusVal, SusVal 2 mentioned it is sometimes difficult for organisations to match the requirements of an incentive: *"for some subsidy programmes there are requirement that are nearly impossible to match or to even be eligible for''* (Respondent 2, SusVal). KnitCo states: *"yeah you really have to come up with a project in the right way to be able to write down all the hours''* (KnitCo 1). KnitCo mentions that this has to do with the innovativeness of their activities. As they are a fashion and lifestyle firm, their new products take way less time to be developed than, for example, a firm that is developing a new sorting machine. Looking at the proposed definition for innovation, KnitCo might indeed be the least innovative firm. All four firms researched state that the intermediary that they use decides whether they are eligible and that whenever an intermediary introduces an incentive, it always means that they are eligible for it.

Proposition 2a: *the manager's expectations regarding eligibility is a barrier to access to GIs*
Proposition 2b: *the innovativeness of the firm influences the manager's expectations regarding eligibility*

4.3.3 Information available

During the interviews, it became apparent that none of the informants is actively involved in the obtainment of information about GIs. All informants mention that they are unaware of the incentives available for their firm. Both the CEO (Paper 1) and controller (Paper 2) of Paper pack state that they deliberately make the consideration not to track all the opportunities and not to obtain knowledge about requirements and availability of incentives. They state that they rely on intermediaries for this, as they are better informed. Paper 1 and Paper 2 mention that they would need additional or different employees to obtain the necessary information about incentives. When asked what kind of employees they would

need for this, Paper 2 stated: *"people who are working with that [GIs]. And who know what is happening and what is available on the subsidy market''* (Paper 2). At Plastic pack, they also make a conscious decision to use an intermediary and outsource their government incentive practices: *"what he [the intermediary] does is keep on scanning the world for subsidy options, and actively show us if they see that there are subsidy possibilities (…)''* (Plastic 1). Paper pack and Plastic pack are both slightly bigger firms. Paper pack exists of around 70 employees, and during the interview with Plastic pack it turned out that they are officially not an SME as they have over 250 employees within the Netherlands alone. All informants of these two firms mentioned during the interviews that they would be able to hire employees specifically for GIs, but that using an intermediary is more effective and financially advantageous.

The CEO's of Bio pack and KnitCo both stated that the lack of information has more to do with the lack of time that they experience: *"if you grow 40% per year, you are barely able to train your people in the correct way, if you develop new products, how much time do you think is left to look into subsidy applications?''* (Bio 1), and: *''are we looking for subsidies? Would be nice, but we actually don't have the time to do so as a firm''* (KnitCo 1). These two firms are relatively small. The CEO of Bio pack mentioned that he does not want to hire additional people, even though he thinks that they could earn back their salary through the incentives obtained. The reason that he does not wish to this is that it is not the mission of the firm. From the interview, it appeared that he wants to be perceived as a sustainable firm, not as one that is focusing on obtaining GIs. KnitCo is currently not involved in any government incentive. The CEO of KnitCo mentions that the reason that they do not have the time is because of their growth and the number of other business activities they are carrying out.

Proposition 3a: *the information available is a barrier to access to GIs*
Proposition 3b: *time available influences the information available*
Proposition 3c: *the relation between time available and information available is influenced by the personnel available, growth of the firm, the number of other business activities and mission of the firm*

4.3.4 Knowledge and capabilities within the firm

For three out of four researched firms, namely: Paper pack, Bio pack and KnitCo, the lack of knowledge and capabilities within the firm was an experienced barrier. The following quotes illustrate this: *"yeah look, we are simply an operational company. Maybe that with the right knowledge and expertise, yeah even if it is writing something. We are really a production company. So that knowledge is… is only moderately present in those areas''* (Paper 1) and: *''no. No, at least I don't [have enough knowledge to write up a project plan]''* (Bio 1). As an explanation for the limited knowledge, the CEO of Paper pack states that they are too small for that. This could be true, considering that Plastic pack (the largest firm) does believe they have enough knowledge within the company: *"it [obtaining GIs] is a trick. If a subsidy bureau can do it, so can we''* (Plastic 1). Paper 2, Bio1 and KnitCo mention that the underlying reason

for the lack of capabilities and knowledge is the type of employees available. The following quotes illustrate this: *"we don't have the people for that, within our firm, to check and keep track of which incentives there are''* (Paper 2), and: *"they [the intermediary] do have the people for that, and the capacity and the knowledge (…) they are specialized in that''* (Bio 1). During the expert interview with SusVal, the employees, and thus lack of knowledge, of a firm was also mentioned as an underlying reason for difficulties with the administration: *"a firm usually doesn't have many people that can write a project plan''* (SusVal 2).

Educational level

The informants of both Bio pack and KnitCo mention their educational level as a reason for the lack of knowledge within the company. The managers stated that they 'only' finished their MBO level education: *"I simply did the 'middelbaar ondernemersschool' (MBO)''* (Bio 1). Later on in the interview, he added: *''Willem is sitting next to me, and Willem did do Saxion (HBO), so I have higher expectations of him than of myself, but yes maybe Willem can do it''* (Bio 1). KnitCo 1 states that if a manager is higher educated, they might find the administrative requirements easier. Both firms are relatively small, meaning that firm size might influence the educational level as well. However, this has not been researched.

Proposition 4a: *knowledge and capabilities within the organisation is a barrier to access to GIs*
Proposition 4b: *knowledge and capabilities within the organisation is influenced by educational level and firm size*

4.3.5 Need for incentive

All informants stated that their firm does not depend on the government incentive for their innovation practices. The CEO of Paper pack illustrates this by stating: *"in general, no I don't think we had a project like (…) that the innovation project depends on the subsidy. Not that''* (Paper 1). Paper pack's controller, who is more involved in the administrative activities or the firm, on the other hand, mentions that when you look at multiple years, they probably do depend on the incentives. The CEO of Bio pack indicates the lack of need for the incentive as well: *"to us, a subsidy is a nice side effect, but it is not a goal in itself. For many firms, it is the goal. For us, we do the job that we have to do no matter what, and that we receive a subsidy for it is nice, but it is not a goal in itself''* (Bio 1). Moreover, Bio 1 mentions that they would work exactly in the same way if they wouldn't receive a government incentive for it. KnitCo does currently not receive any GIs, and their CEO mentions that they also don't necessarily need it.

During the interview with Plastic 1, it became apparent that Plastic pack is more interested in obtaining GIs than the smaller firms are. Their reason for this is that by using a government incentive they can compete with their competitors and keep the price of their products lower. The amount of money that

they receive is significant. For WBSO alone, they receive €2.5 ton per year. As all their competitors are receiving incentives as well, they need this extra money to be able to compete, price-wise. This information indicates that for larger firms, with more employees, the incentive that they receive is higher and has more impact, which in turn means that they are more interested in obtaining them.

Proposition 5a: *the need for the government incentive is a barrier to access to GIs*
Proposition 5b: *firm size influences the need for the government incentive*

4.3.6 Administration

During the interviews, all researched firms named administration as a barrier for accessing GIs. Therefore, this is probably the most significant barrier experienced. As mentioned earlier, the lack of knowledge and capabilities within the firm is one underlying reason for the perceived administrative burden. Furthermore, the informants from Paper pack, Bio pack and KnitCo named the amount of time it takes to write up the application as an experienced barriers. As mentioned before, the personnel available, growth of the firm, the number of other business activities and mission of the firm influence time. The CEO of KnitCo illustrates this by discussing one of their suppliers: *"that is what I mean, that is a firm existing of 800 people. And there are simply 4 or 5 people who are only applying for GIs''* (KnitCo 1). The CEO of Paper pack states: *"yeah it is busy, it is a process that you don't do every day. And then we are only a relatively small firm with 70 people, mainly production, with our knowledge to create the application, you need to have time for that''* (Paper 1). This indicates that this is a barrier that larger firms do not experience. This might be true, considering the innovation and development manager of Plastic pack mentioned that they could employ people that would only work on GIs, but consciously choose not to do this.

Firm size might be overshadowed by the fact that managers of SMEs don't find GIs that interesting. Bio pack states: *"it [having issues with the administrative part] is personal right. You simply have to make time for it''* (Bio 1). The expert interview with informants from SusVal showed that the hassle accompanying the incentive, writing reports and applying for incentives, is a major barrier: *"Like in the Achterhoek, there are many firms that just don't feel like doing that [the administrative hassle]. They simply say: alright, we'll do this ourselves. We'll simply just put some money together and forget about the subsidies. Good for you, but we are not getting involved in that''* (Respondent 2).

Proposition 6a: *administrative burden is a barrier to access to GIs*
Proposition 6c: *time available influences the experienced administrative burden*

4.4 Experienced barriers when managing government incentives

The interviews showed that once a government incentive has been obtained, managers only experience one barrier, namely: administration. The CEO of Bio pack, for example, mentions: *"the complete*

administrative part of the subsidy, that is the thing that I sometimes have difficulties with'' (Bio 1). For the CEO of KnitCo, the reason to quit the WBSO was that there was too much administration involved in the management of it: *"yeah, because…, well yeah just the hassle of paper and the keeping track of the administrative hassle. For us as a firm that wasn't... yeah. It had too much impact''* (KnitCo 1). The CEO of Bio pack mentions that it costs him too much time, which is why he was contemplating quitting the WBSO: *"at a certain moment you are afraid that you do a lot, and you also do what you wrote down you would, that your administrative tasks stay behind. That you can show the result, but cannot support it with hard data. And therefore, I had intentions to quit last year''* (Bio 1).

Only two firms researched did not experience this barrier, or experienced it less. These firms are Paper pack and Plastic pack, the largest firms researched. Informants of both firms stated that they found a structured way to handle the administrative burden. The CEO of Paper pack states: *"for managing it [GIs], it is making sure that your documentation and registration is in order. Especially for WBSO, keeping track of the hour administration''*(Paper 1). Their way of coping with this is by making one of the employees responsible for keeping track of the hours. That employee should make sure that his colleagues write down the hours they spend on innovating every week. This might, however, not be possible if they would have been smaller. Plastic pack states that they don't experience any barriers, because of the role of the intermediary, at all: *"if I can talk for myself, we have a short meeting twice a year. A meeting that costs me, well I think half a day every half a year. And those meetings are always a lot of fun''* (Plastic 1). Informants of these firms are, however, working at the management level, which could mean that they are simply less involved in keeping track of the administration.

Proposition 7a: *administrative burden is a barrier to the management of GIs*
Proposition 7b: *firm size influences the experienced administrative burden*

4.4.1 Administration

All informants, except the innovation and development manager from Plastic 1, mention that the administrative hassle is the main reason why they experience difficulties with managing GIs. There are several underlying reasons for the experienced administrative hassle.

Time available

The first underlying reason is the time available. The informants from Bio pack and KnitCo both mentioned that they did not feel like they have enough time to keep track of the hours spend on innovation. The following quote illustrates this: *"yeah, because you still had to… in the agenda's you had to search back for things. Or catch up, or make up to make sure it was correct. (…) because then you didn't do it for a month or two. Then you had to clear half a day for that, to completely relive it''* (KnitCo 1). KnitCo 1 stated that they wanted to be extremely accurate with the administrative

requirements. The CEO of Bio pack, also one of the smaller firms, did also mention that he does not have enough time to keep track of the administrative requirements. However, he has a more casual attitude towards administration. During the interview he mentioned: *"yeah we should be doing that, but you are also limited because of time. Look, I am working 60 hours per week already, to add 4 hours to that… it is also just laziness, I admit that. It is only sitting down for 10 minutes each day to see what have you been doing, but I am not doing that''* (Bio 1). The informants of larger firms, Plastic pack and Paper pack, seem to have fewer problems with their available time. This might be because the informants are not involved in the administration and make someone else responsible for it.

Just like during the accessing phase of obtaining the government incentive, available time is influenced by firm growth, lack of personnel and the number of other business activities. The CEO of KnitCo mentions: *"but in the end, for us as a firm that is such an administrative hassle. And the firm was in such a motion towards growth that we stopped at a certain moment. Because to us, it was not possible to keep track. Because we had to do that ourselves and we had other things to do''* (KnitCo 1). Although it wasn't researched, the growth of the firm might be influenced by firm size, as smaller firms can grow quicker.

All informants mentioned that within their firm, they don't have the right people for obtaining GIs. The informants from Paper pack and Plastic pack, the larger firms, don't see hiring an employee for this as a good investment. This is illustrated by the following quotes: *"no it's not worth it. It is not worth the investment''* (Paper 1), and: *"two things. For a part it is easier. Because we don't have to train someone within the company for that, hire someone. And I think that therefore, in the end, it is more effective and better that that expertise is clustered in that kind of bureau that is only working with that, than if we would for example clear half an FTE that does other things half of the time and is not continuously involved in that world''* (Plastic 1). For the CEO of KnitCo, a smaller firm, the required personnel is different. The CEO of KnitCo mentioned that they need an administrative person within the firm to keep track of these requirements. In a larger firm, there might be departments dedicated to only administration. The CEO of KnitCo is the only informant who mentioned the number of other business activities they partake in: *"as a smaller company you are merely an entrepreneur that that does the consultation straight at the workplace. And you are busy with a lot of things at the same time''* (KnitCo 1). This could also be influenced by firm size, as larger firms often have several departments, with more specialized tasks.

Proposition 8a: *time available influences the experienced administrative burden*
Proposition 8b: *personnel available, the growth of the firm and the number of other business activities of a firm influence time available*
Proposition 8c: *firm size influences the relation between personnel available, growth of the firm and the number of other business activities of a firm and time available*

Structuredness

According to informants from Paper pack, KnitCo and Bio Pack, another underlying reason for the experienced administrative barrier is the structuredness of the firm. The CEO of KnitCo states: *"because you have to ask other people, things are often evaluated at the workplace. During the work process. And I think that this is where the problem lies''* (KnitCo 1). The informant from Plastic pack did not mention structuredness during the interview. However, their website shows that they have several departments that are specialized in a particular topic, which could mean that they indeed work in a more structured way. For smaller firms, especially like KnitCo that only exists of 15 people and Bio pack that only exists of 9 people, their organisational structure might not exist of several departments. The CEO of KnitCo mentioned during the interview that people within their firm do indeed work for the different brands and execute several tasks. Furthermore, he states that currently they have grown and have an administrative and HR department, which, according to the CEO of KnitCo, would make it easier to be involved in GIs: *"if you now take the next step, where we are now, then you could have someone do it for you. Then you can pass it [the hour administration, for example] on; then it is being administrated for you. Then it is already easier''* (KnitCo 1).

The CEO of paper pack mentions: *"that [finding out how many hours you really spent on something] is difficult because you are often doing things in between other activities''* (Paper 1). However, the CEO does not have to be personally involved in this. The second informant of Paper pack, their controller is more involved in the administrative requirements. During the interview, it became apparent that Paper pack makes one of the employees responsible for keeping track of the hour administration during the course of that specific year. This might not have been possible if they were a smaller firm.

Proposition 9a: *structuredness of the firm influences administrative burden*
Proposition 9b: *firm size influences the structuredness of a firm*

4.5 Role intermediary

During the interviews and analysis is became apparent that the role of the intermediary is crucial. All firms researched use some sort of intermediary when applying for GIs. SusVal states: *"usually it is a third party that arranges these kinds of things [the application for the incentive]. Some organisations have that themselves, and sometimes it is an educational institution doing a subsidy trajectory looking for organisations to participate. And then it is the educational, eh does it [the application]. It is rarely the case that firms write along in those kinds of things. Usually, it is a third party who does it''* (Informant 2). Firms that do apply for the incentive by themselves: *"accidentally have someone within the firm who can do it''* (SusVal, Informant 2), with which they mean someone that knows how to write a project plan. According to SusVal, firms usually don't have many people that can write a project plan within the firm, nor do they have the motivation to apply.

Informants from Paper pack, Bio pack, and Knitco mention that without an intermediary, they wouldn't have partaken in the process of obtaining a government incentive. Paper 1 states: *"look, we luckily have that agreement with that designer who does it all, but otherwise we wouldn't have.. I think. Look, WBSO we would have. That is just, well with help from Boonstoppel that is an easily manageable process. But you do need some people and knowledge to do so''* (Paper 1). With this, they stress the necessity of using an intermediary in combination with experienced barriers regarding personnel and knowledge. The only firm that does not state this explicitly is Plastic pack. However, they consciously choose to work with an intermediary and see this as outsourcing.

The role of the manager of an SME in the process is often more passive. All informants interviewed state that the part they play in the process of obtaining GIs for CI is mainly as an information provider. Paper 1 states: *"I am present at every quarterly meeting with Lucas, with Boonstoppel. There we decide how many hours we expect to need for something. And also by making a choice what we do and do not involve in the WBSO, so that''* (Paper 1). Also when Paper pack uses another intermediary, they have this more passive role. In that case, they work together with a product designer who creates the application for larger incentives such as the MIT Feasibility study.

4.5.1 Type of intermediary

During the interviews, it became apparent that all researched firms make use of an intermediary in the process of obtaining GIs. These intermediaries take away some of the experienced barriers. The following quote illustrates this: *"is it difficult? I wouldn't know. You'd have to ask Boonstoppel''* (Bio 1). Several intermediaries came up during the interviews.

Branch organisation

The CEO of KnitCo mentioned that their branch organisation, Modint, has asked them to participate in joint venture projects, several times before: *"yes that is through the Modint. And so they know that we are open to it''* (KnitCo 1).

Commercial firms

All firms researched used a commercial firm to apply for GIs. According to the informants, these commercial firms earn their money this way: *"let's be real, it is a revenue model from Boonstoppel. You pay 12% of what you receive [from the incentive] to them. It is their revenue model, but for both sides it is attractive''* (Bio 1). The innovation and development manager of Plastic pack states the same: *"and I think that they make great money out of us. That 15%, at least I assume that's what they take, that that is well-earned money. But the system works, and they are a trustworthy and good partner. So for us, it is the right way''* (Plastic 1)

An individual

Paper pack works together with a product designer, who is actively involved in the process of obtaining GIs. The CEO of Paper pack states: *"that is more initiated by him [the designer]. He has more of a background in that. He then also takes care of the documentation, so he makes sure that it [the application] stands out. He is also the one generally taking care of the patent application''* (Paper 1).

University/research institutions

The CEO of Bio pack states that they often participate in subsidy projects, initiated by a university or research institution: *"that is a Wageningen University (…) or that are organisations specialized in this. Such as research institutions. They usually ask you to participate''* (Bio 1). During the interview, it became apparent that these are often larger projects, including several parties that are involved in sustainable packaging.

Valley organisations

During the expert interview with SusVal, it became apparent that they sometimes initiate projects, but only do this if the projects are big an if several different parties are involved. For smaller projects, they mainly connect the organisation with another intermediary: *"so yeah, the first place where can we bring them to, we usually know. The actual writing of such an application is only something we do when it consists of a huge cluster that is operating in cluster activities. But actually, besides that, we don't assist in writing the application''* (SusVal 2).

4.5.2 Activities intermediary

Acquisition and persuasion of the managers of an SME

According to the innovation consultants at Boonstoppel, firms either come to them, or they initiate contact with the firms. The CEO of KnitCo also mentions that often intermediaries contacted them: *" (…) but before that, there have been three or four other subsidy bureaus that came and visited, because of course you are being called quite a lot regarding that [GIs], at least we had that for a while''* (KnitCo 1). Not only do intermediaries have to carry out acquisition activities, the CEO of Bio pack even states that the intermediary that they use had to convince and persuade them not to quit the WBSO incentive. The following quotes illustrate this: *"I actually had intentions to quit [WBSO] last year, and then I ran into Boonstoppel at a bio Netherlands congress, and they told me 'ah Patrick, you have to do it! It is low-hanging fruit'. And then I let myself be convinced''* (Bio 1), and: *"to be honest, they just kept coming. Like: 'Patrick, you are missing out on money, you are missing out on money. You have to do it, you have to do it'. And well yes, a conversation is always possible''* (Bio 1).

Influence on the manager's expectations regarding chance of success and eligibility

During the interviews, all informants mentioned that they decide upon the chance of obtaining the incentive and their eligibility together with the intermediary. The CEO of Paper pack even suggests that when the intermediary proposes an incentive possibility, they already know that they are eligible: *"the moment he proposes it [to apply for the incentive], the chance is already existing''* (Paper 1). The CEO of KnitCo also mentions that other intermediaries did not think that their activities were innovative enough for GIs until the intermediary that they used got into contact with them. This intermediary convinced them that they would be eligible for incentives: *"Boonstoppel convinced us that we stood a chance, because we had bureaus [intermediaries] here before and they were like, yea. They immediately disengaged again because they saw that it was not a large pot of money. But Boonstoppel did put time and energy in it. And they did do it'' (*KnitCo 1).

Proposition 9: *the experienced barrier expectations regarding chance and eligibility is influenced by the use of an intermediary*

Find organisations to participate in trajectory

As mentioned before, during the interview with the CEO of Bio pack, the CEO of KnitCo and the experts of SusVal, branch organisations, universities/knowledge institutes and valley organisations sometimes initiate larger projects for which they look for organisations to participate. The following quotes illustrate this: *"we often get asked for European subsidy projects, because we are innovating quite a lot ourselves we often get asked for subsidies''* (Bio 1), and: *"by the way, we are currently also involved in a subsidy, something with textile. We were approached for that by the Modint''* (KnitCo 1).

Administration

All informants mention that the intermediary does most of, if not all, of the administration when accessing GIs. The following quotes illustrate this: *"and then they wrote a new report, and I started with WBSO again''* (Bio 1), *"there is no danger in it [the administrative requirements] to us because he [the designer/intermediary] does it for us. So yeah, in general, he writes up the whole application and sometimes we have to add something. Sometimes there is some information coming from us. Whenever that is a machine technical question, with an investment involved, then we, of course, have to deliver information. (…) so we deliver that information. And the biggest part of the administrative burden is with him''* (Paper 1), *"the application was not difficult, but of course, Boonstoppel did it. They make a story out of it. So with that, they take something off your plate''* (KnitCo 1), and: *"the annoying part is the writing of the proposals, and that is the part that Boonstoppel does''* (Plastic 1). However, all informants talk about the accessing phase, and not about the managing stage of obtaining the incentive.

The informants of the researched SMEs, Paper pack, Bio pack, and KnitCo, mention that without the intermediary taking care of the administration, they would probably not obtain incentives: *"especially if you are creating some bigger applications, it needs to be translated one way or the other. With the correct structure and text. And we are lucky that we have the partnership with the designer, that is what makes it possible for us. I don't know if I would do it the moment I didn't have that partnership''* (Paper 1), and: *''yeah, that [writing up the project plan] would be a no-go for us''* (KnitCo 1). The CEO of Bio pack states that the reason that they don't want to be the applicant in the process is because of the amount of work it involves: *"we are never the applicant in that process, never. Because I also see the terrible amount of work that you have to do to keep up with those European subsidy projects''* (Bio 1).

Proposition 10: *the experienced barrier administrative burden influenced by the use of an intermediary*

Provision of information

During the interviews, all informants mentioned that they do not possess the required information, nor are they interested in getting more actively involved in the obtainment of GIs. Apart from the CEO of KnitCo, as they are currently not receiving GIs, all informants state that they rely on the intermediary for obtaining the information. The following quote illustrates this: *"he follows that. He follows all opportunities that exist. So he knows exactly which subsidies are available, which requirements are in place, which roads to take. And, of course, he is also so deeply involved in the project that he knows okay this is what's going on right now, that matches this subsidy opportunity. That knowledge, we simply don't have that. And we consciously make that consideration as well. And he does make it''* (Paper 1).

During the interviews, it became apparent that for all researched firms, the intermediary judges if the firm is eligible for a particular incentive, what the requirements are, and if the SME has a chance of obtaining the incentive. The following quote illustrates this: *"yes the designer knows that 9 out of 10 times. Maybe 10 out of 10 times these days. (…) but we make it [the judgement about chances] together with him. Generally, he is that good that at the moment he proposes it [the incentive option], the chance is already there. The selection phase takes place before he comes to us. In case that there is no chance or little chance, he also doesn't put any energy into it. So then we get the question, I already know that if he comes with a question I can say yes''* (Paper 1).

Proposition 11: *the experienced barrier information available is influenced by the use of an intermediary*

4.6 Conceptual framework

The propositions are illustrated in the proposed conceptual model below, in Figure 2.

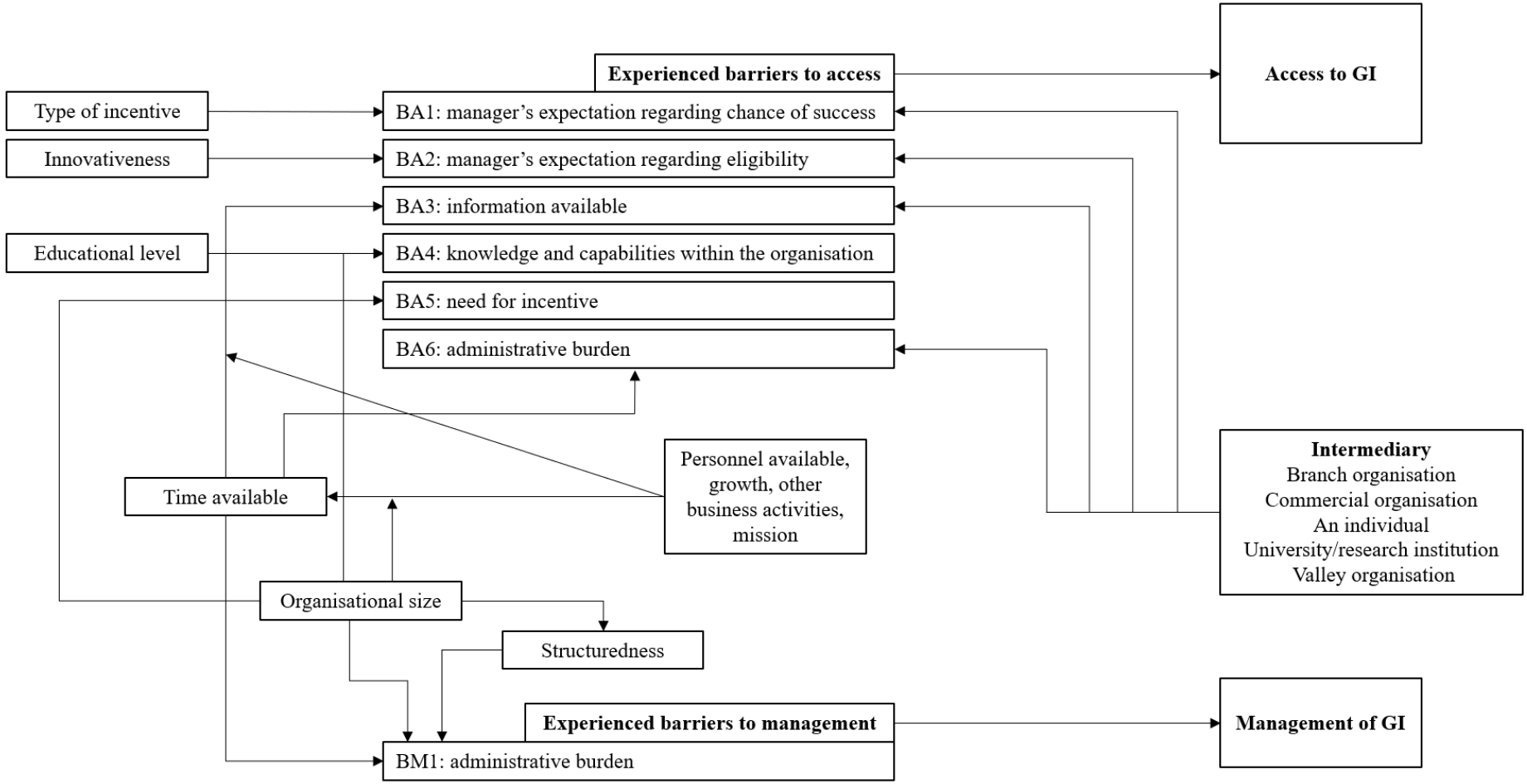

***Figure 2**: Proposed conceptual model*

Chapter 5. Conclusion and discussion

5.1 Conclusion

The purpose of this research was to understand the process of obtaining GIs for CI and the barriers that managers of Dutch SMEs experience throughout this process. The research question of this study was therefore: *what are the barriers that managers of Dutch SMEs experience when accessing and managing national GIs for CI?* To answer this research question, five managers from four Dutch manufacturers were interviewed. Additionally, two experts working at an intermediary that assists SMEs in the process of obtaining GIs for CI were interviewed, and two experts working for SusVal, an organisation operating as a valley bureau, focused on assisting organisations in becoming more circular. The main findings that resulted from these interviews will be discussed in this chapter.

5.1.1 Government incentives for circular innovation and the process of obtaining them

Experts from Boonstoppel discussed that there are no specific GIs for CIs at the micro level. For circular product innovation, SMEs can use general government incentives. The firm interviews showed that SMEs don't differ between types of government incentives. Six innovation incentives were mentioned: the WBSO, MIT: Feasibility study, MIT: R&D collaboration, innovation credit and INTERREG. Furthermore, the expert interviews with informants from Boonstoppel were used to define the process of obtaining GIs. This process was divided into accessing GIs and managing GIs. Accessing GIs exists of the steps: obtaining information, go/no-go decision (by intermediary), administrative requirements, submit application and go/no-go decision (by government). Managing GIs exists of the steps managing the government incentive and finishing the government incentive project.

5.1.2 Barriers when accessing government incentives

Most of the barriers are experienced when accessing GIs. Although all barriers are very much intertwined, they will be discussed as separately as possible. The first two defined barriers were, although confirmed during the expert interviews, only experienced by one firm. This should be taken into account when interpreting the results. The **first** experienced barrier is the manager's expectations regarding chance of success. Depending on the type of GI, if managers feel like the outcome of the process of obtaining GIs is a lottery, they experience the chance of success as a barrier to access to GIs. The **second** experienced barrier is the manager's expectations regarding eligibility. This barrier is influenced by the innovativeness of the firm. When firms are less innovative, managers feel like they are less eligible experience their expectations regarding eligibility as a barrier to access to GIs. The **third** experienced barrier has to do with the available information. The managers of the researched firms all mentioned that they don't have the required information, making it less likely that they access GIs. The biggest reason for not having the information is because managers don't have time to look into the available information. This is influenced by the personnel available, the growth of the firm (less growth

means more time), the number of other business activities (less activities means more time) and the mission of the firm. The **fourth** experienced barrier is the knowledge and capabilities within the firm. Informants from all firms, except for Plastic pack, mention that they don't have the necessary knowledge and capabilities to access GIs. As this was mentioned by the smaller firms, firm size influences this. Furthermore, Bio pack and KnitCo mention their educational level as a reason for the lack of knowledge within the company. The **fifth** experienced barrier is the lack of need for the incentive. All firms are not dependent on the GI, which makes it barrier to access to GIs as it restraints them from accessing GIs. Plastic pack seems to be the firm benefiting most from the incentive. This implies that firm size influences the need for the government incentive. The **sixth**, and biggest experienced barrier is the administrative burden. All informants mentioned this barrier. The administrative burden is influenced by time available. The more time managers have available, the less likely it is that administration is experienced as a burden.

5.1.3 Barriers when managing government incentives

The only barrier experienced when managing GIs is the administrative burden. SMEs need to keep track of, for example, their hours, which they often find difficult. One of their reasons for this is that they don't have the time available, or don't prioritize this administration. Administrative burden as a barrier to the management of GIs is influenced by firm size. Larger firms seem to have less difficulties with the administrative requirements. Furthermore, administrative burden is influenced by time available, which is influenced by personnel available, the growth of the firm and the number of other business activities of a firm. Lastly, the administrative burden is influenced by the structuredness of the firm. The more structured a firm works, the less administrative burden managers experience. Firm size influences the level of structuredness. Larger firms work in a more structured way than smaller firms.

5.1.4 Role of the intermediary

During the interviews, it became apparent that SMEs are not that interested in GIs. This means that they are not willing to put time and effort into this. Therefore, all firms value the use of an intermediary highly. The types of intermediaries that SMEs use are: branch organisations, a commercial organisation, an individual such as a product designer, a university/research institution or a valley organisation. Activities that this intermediary partakes in are: the acquisition and persuasion of the managers of an SME, influence the manager's expectations regarding chance and eligibility, finding organisations to participate in incentive trajectory, taking care of the administrative requirements and the provision of information for the manager of the SME (including judging the requirements of incentive and convincing managers of SMEs that they have a shot). Therefore, use of an intermediary influences the following experienced barriers to accessing GIs: the manager's expectations regarding chance and eligibility, the information available, and the administrative burden. During the expert interviews with a commercial intermediary it became clear that they are most active during the process of accessing GIs.

The role of the SME at this point is mainly to provide the intermediary with the necessary information. When managing the government incentive, the SME takes on a more prominent role. They are then responsible for keeping track of the administrative requirements.

5.2 Discussion

5.2.1 Implications of this research

Theoretical implications

Previous research on barriers to GIs for CI was limited. Meijer et al. (2019) proposed some barriers, namely that the process of obtaining GIs is time-consuming (including too many administrative activities), perceived to be unfair and that accessing incentives can take too long. Also Cecere et al. (2018) state that GIs for sustainable innovation could be simplified in order to reduce the administrative burden and make them more accessible to SMEs. The results of the undertaken study showed that SMEs do, indeed, experience barriers when accessing and managing government incentives. The administrative burden is proposed to be the most significant barrier for both accessing and managing incentives. For managing GIs, it is also the only experienced barrier. None of the researched firms mentioned that the process is unfair or that the Dutch government favours early-stage innovations; however, the process is sometimes experienced as a lottery. As only one firm has mentioned this, at this moment in time, it is unsure whether this is the case or if that specific firm is an exception.

Shlay et al. (2004) studied barriers to subsidies meant for families to help pay for child care. These barriers were translated so that they could be used in this study. Most of the barriers found by Shlay et al. (2004) have been confirmed by this study. Managers of SMEs might believe that they are ineligible for incentives, might not be aware of their existence, might not believe they need the incentive, experience too much administrative hassle and are unsure of the regulations for GIs. The barriers that were not confirmed were the stigma related perceptions regarding CI incentives and the idea that the incentive interferes with the SMEs CI practices. Incentives do interfere with the other activities that an SME is involved in. Informants mentioned that having to keep up with the administrative requirements distracts from their business activities. However, this is not equal to the barrier mentioned by Shlay (2004), that the use of a subsidy interferes with the choice of CI practices. The results of the undertaken study show that experienced barriers to obtaining GI are almost equal to obtaining barriers for child care subsidies. This implies that the same barriers exist no matter the purpose or target group of the incentive.

This study adds to the existing literature by highlighting the importance of the use of an intermediary. In 2016, the ministry of economic affairs researched that 72% of the MIT applications and 82% of the WBSO applications goes through an intermediary (Financieel Dagblad, 2016). According to (Polzin et al., 2016), the use of an innovation intermediary has been proven to accelerate the diffusion and commercialisation of (eco-)innovation. While the undertaken study has not looked into the effect of GIs

on CI, all informants mentioned that without the use of an intermediary, they would not try to access GIs. Using an intermediary is a way of outsourcing some business activities. Barthélemy (2003, p. 87) define outsourcing as: *''turning over all or part of an organisational activity to an outside vendor."* Research on outsourcing states that managers who are not in favour of outsourcing do not see a benefit from it or perceive too many risks related to its use (Espino-Rodríguez and Ramírez-Fierro, 2018). This study proposes that the perceived benefits depend on firm size. Managers of smaller firms experience outsourcing more as an inconvenience and a costly activity, while larger firms might find it financially beneficial and more effective.

The government uses financial measures to stimulate CI. However, this study discovered that SMEs might be more willing to participate in sustainability and circularity because of consumer demand and public opinion. As Lin and Zheng (2016) stated, organisations are slowly starting to shift to activities that improve environmental quality while sustaining economic growth. During the interviews, it became apparent that for some firms, the motivation to undertake circularity practices is mainly because of market demand. Some managers might see sustainable or circular innovation as a chance to improve economic growth. This is inconsistent with the statement by Schaltegger and Wagner (2011), who state that sustainable development requires both sustainable innovation and sustainable entrepreneurs or intrapreneurs that put these sustainable innovations at the core of their business. It is also inconsistent with studies about CI barriers. Tura et al. (2019), for example, state that firms that are operating in the CE experience a lack of social awareness and uncertainty of consumer responsiveness and demand. According to the informants interviewed, market demand might be one of the most significant stimulants for CI.

Although no previous definition for CI was found, firms wanting to work with the CE at a micro level can partake in several practices. Kristensen and Mosgaard (2020) for example name nine CE categories that emerge at the micro-level, namely: recycling, remanufacturing, reuse, resource-efficiency, disassembly, lifetime extension, waste management, end-of-life management and multidimensional indicators. In this study, firms engaged most in recycling, reuse, resource-efficiency and end-of-life management. This is consistent with the research of Bassi and Dias (2019), who state that the circular practice most used by SMEs is recycling or reusing or reselling waste. Not only did informants mention that their firm is involved in, for example, recycling, the informants operating in the packaging industry were also involved in developing innovative ways in which their products can be recycled better.

Managerial implications

This paper also has some critical managerial implications. First of all, it provides an overview of the process of obtaining GIs for CI and innovation in general. In this process, the role of the SME, as well as the intermediary and the government, have been explained. As many SMEs make use of an

intermediary, it might be relevant to understand what this process entails. Also, the proposed barriers give an insight into the role of the intermediary, which will help SMEs understand their role in the process. Secondly, the proposed barriers provide an insight into the required activities an SME has to partake in when obtaining GIs. This might help them to form better decisions about if this is what they want or not. Lastly, this research might be relevant to firms wishing to participate in the CE. It could help them to understand what they can do on a micro-level. Furthermore, there are some barriers to GIs specifically meant for the CE. SMEs that wish to participate in the CE should keep these in mind when they want to obtain GIs.

5.2.2 Limitations of this research and suggestions for future research

This research has several limitations. Firstly, whereas the research aimed to discover the barriers that managers of Dutch SMEs experience in the obtainment of GIs for CI, only four firms have been researched. Of these four firms, one turned out to be too big to match the criteria to be an SME. This number is too small to draw convincing conclusions. Three out of four firms were operating in the packaging industry, while the manufacturing industry exists of far more than just this. This might be an explanation as to why the results were quite similar for all firms. Therefore, it is recommended to conduct quantitative research. As mentioned before, in explorative research, qualitative research often precedes quantitative research. A bigger scale quantitative research will help to understand the proposed barriers and their relation better. The results of the quantitative research can help to conclude whether the proposed barriers can be confirmed.

Secondly, this study did not take firm size into account properly. SMEs can still very much differ in size, from only a few up until 250 employees. The results of this study implied that firm size makes a difference when it comes to experienced barriers. Larger firms seem to have fewer difficulties with keeping track of the administrative requirements and are more consciously aware that using an intermediary is merely a type of outsourcing. However, not enough research has been done to actually conclude this. Therefore, future research should take into account the firm size.

Thirdly, all firms researched were accessed through an intermediary. This could be an explanation as to why the role of the intermediary is so important. Further research could focus more on the role of the intermediary in the process. It would be interesting to understand better why there is such a need for intermediaries. It would also be interesting to compare firms that used an intermediary to firms that did not, to understand experienced barriers better.

Lastly, none of the investigated firms were unable to obtain any type of GI. This could have an effect on the results of this study. Firms that have not been able to obtain GIs might, for example, experience

different barriers. Future research should aim to also look at firms that have not been able to obtain GIs. The results should be compared to the results of firms that did manage to obtain GIs.

There are some additional suggestions for future research. First of all, SMEs do not differentiate between their innovation practices. This means that they view CI, as defined in this research, the same as other types of innovation. This would mean that financial incentives are not the best way for the Dutch government to stimulate CI. Research should, therefore, focus more on the underlying reason to participate in CI. The results of this research show that market demand and public opinion might be bigger stimulants. Mura et al. (2020) also state that firms implementing CE practices perceive them as a business opportunity rather than as a cost. However, higher costs are the main barrier to the CE for early adopters. This would imply that financial incentives might be a relevant stimulation to the CE if they were used in a different way than they are now. Future research could give insights into what SMEs need and how they are stimulated appropriately to produce CIs.

Furthermore, during the interviews, it became apparent that while GIs for CI are equal to GIs for regular innovation, there are some specific GIs for the CE. This CE mainly focuses on the complete supply chain. research could look into the role of the intermediary, the type of the intermediary and the barriers experienced in the process of obtaining these incentives. As SusVal mentioned in this study, organisations that apply for CE incentives experience additional barrier, such as more uncertainty about partners.

References

Achterkamp, M. C., & Vos, J. F. (2006). A framework for making sense of sustainable innovation through stakeholder involvement. *International Journal of Environmental Technology and Management*, *6*(6), 525. doi:10.1504/ijetm.2006.011895

Adams, R., Jeanrenaud, S., Bessant, J., Denyer, D., & Overy, P. (2015). Sustainability-oriented Innovation: A Systematic Review. *International Journal of Management Reviews*, *18*(2), 180-205. doi:10.1111/ijmr.12068

Amabile, T. M. (1988). A Model of Creativity and Innovation in Organizations. *Research in Organizational Behavior*, *10*, 123-167.

Anastasiades, K., Blom, J., Buyle, M., & Audenaert, A. (2020). Translating the CE to bridge construction: Lessons learnt from a critical literature review. *Renewable and Sustainable Energy Reviews*, *117*, 109522. doi:10.1016/j.rser.2019.109522

Aranda-Usón, A., Portillo-Tarragona, P., Scarpellini, S., & Llena-Macarulla, F. (2020). The progressive adoption of a CE by businesses for cleaner production: An approach from a regional study in Spain. *Journal of Cleaner Production*, *247*, 119648. doi:10.1016/j.jclepro.2019.119648

Arranz, N., Arroyabe, M., Li, J., & De Arroyabe, J. F. (2019). An integrated model of organisational innovation and firm performance: Generation, persistence and complementarity. *Journal of Business Research*, *105*, 270-282. doi:10.1016/j.jbusres.2019.08.018

Atuahene-Gima, K., & Murray, J. Y. (2007). Exploratory and Exploitative Learning in New Product Development: A Social Capital Perspective on New Technology Ventures in China. *Journal of International Marketing*, *15*(2), 1-29. doi:10.1509/jimk.15.2.1

Banai, Á., Lang, P., Nagy, G., & Stancsics, M. (2020). Waste of money or growth opportunity: The causal effect of EU subsidies on Hungarian SMEs. *Economic Systems*, 100742. doi:10.1016/j.ecosys.2020.100742

Banerjee, R., & Gupta, K. (2019). The effect of environmentally sustainable practices on firm R&D: International evidence. *Economic Modelling*, *78*, 262-274. doi:10.1016/j.econmod.2018.09.024

Barthélemy, J. (2003). The seven deadly sins of outsourcing. *Academy of Management Perspectives*, *17*(2), 87-98. https://doi.org/10.5465/ame.2003.10025203

Bassi, F., & Dias, J. G. (2019). The use of CE practices in SMEs across the EU. *Resources, Conservation and Recycling*, *146*, 523-533. doi:10.1016/j.resconrec.2019.03.019

Bilbao-Osorio, B., & Rodriguez-Pose, A. (2004). From R&D to Innovation and Economic Growth in the EU. *Growth and Change*, *35*(4), 434-455. doi:10.1111/j.1468-2257.2004.00256.x

Blomsma, F., Pieroni, M., Kravchenko, M., Pigosso, D. C., Hildenbrand, J., Kristinsdottir, A. R., McAloone, T. C. (2019). Developing a circular strategies framework for manufacturing

companies to support CE-oriented innovation. *Journal of Cleaner Production*, *241*, 118-271. doi:10.1016/j.jclepro.2019.118271

Bocken, N. M., & Geradts, T. H. (2019). Barriers and drivers to sustainable business model innovation: Organization design and dynamic capabilities. *Long Range Planning*, 101-950. doi:10.1016/j.lrp.2019.101950

Bocken, N. M., De Pauw, I., Bakker, C., & Van der Grinten, B. (2016). Product design and business model strategies for a CE. *Journal of Industrial and Production Engineering*, *33*(5), 308-320. doi:10.1080/21681015.2016.117212

Bos-Brouwers, H. E. (2009). Corporate sustainability and innovation in SMEs: evidence of themes and activities in practice. *Business Strategy and the Environment*, n/a-n/a. doi:10.1002/bse.652

Cambridge Dictionary. (n.d.). *Access | meaning in the Cambridge English dictionary*. Cambridge Dictionary | English Dictionary, Translations & Thesaurus. Retrieved May 10, 2020, from https://dictionary.cambridge.org/dictionary/english/access?q=accessing

Cambridge Dictionary. (n.d.). *Management | meaning in the Cambridge English dictionary*. Cambridge Dictionary | English Dictionary, Translations & Thesaurus. Retrieved May 10, 2020, from https://dictionary.cambridge.org/dictionary/english/management

Cecere, G., Corrocher, N., & Mancusi, M. L. (2018). Financial constraints and public funding of eco-innovation: empirical evidence from European SMEs. *Small Business Economics*, *54*(1), 285-302. doi:10.1007/s11187-018-0090-9

Ceschin, F., & Gaziulusoy, I. (2016). Evolution of design for sustainability: From product design to design for system innovations and transitions. *Design Studies*, *47*, 118-163. doi:10.1016/j.destud.2016.09.002

Chandy, R. K., & Tellis, G. J. (1998). Organizing for Radical Product Innovation: The Overlooked Role of Willingness to Cannibalize. *Journal of Marketing Research*, *35*(4), 474. doi:10.2307/3152166

Chapman, G., Lucena, A., & Afcha, S. (2018). R&D subsidies & external collaborative breadth: Differential gains and the role of collaboration experience. *Research Policy*, *47*(3), 623-636. doi:10.1016/j.respol.2018.01.009

Charfeddine, L., & Kahia, M. (2019). Impact of renewable energy consumption and financial development on CO2 emissions and economic growth in the MENA region: A panel vector autoregressive (PVAR) analysis. *Renewable Energy*, *139*, 198-213. doi:10.1016/j.renene.2019.01.010

Charter, M., & Clark, T. (2007). Sustainable Innovation. *The Centre for Sustainable Design*. https://pdfs.semanticscholar.org/ae24/3e7bb1d2d0fffdb1f629a5dd3dab856e6d37.pdf?_ga=2.4610867.1256347482.1592653471-204351237.1592653471

Clarkson, J., & Eckert, C. (2010). *Design Process Improvement: A review of current practice*. Berlin, Germany: Springer Science & Business Media.

Cohen, W. M., & Levinthal, D. A. (1989). Innovation and Learning: The Two Faces of R & D. *The Economic Journal*, *99*(397), 569. doi:10.2307/2233763

Cooper, R. G., & Kleinschmidt, E. J. (1995). Benchmarking the Firm's Critical Success Factors in New Product Development. *Journal of Product Innovation Management*, *12*(5), 374-391. doi:10.1111/1540-5885.1250374

Creswell, J. W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks, CA: SAGE.

Creswell, J. W. (2013). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Thousand Oaks, CA: SAGE.

Curtis, S., Gesler, W., Smith, G., & Washburn, S. (2000). Approaches to sampling and case selection in qualitative research: examples in the geography of health. *Social Science & Medicine*, *50*(7-8), 1001-1014. doi:10.1016/s0277-9536(99)00350-0

de Jesus, A., Antunes, P., Santos, R., & Mendonça, S. (2018). Eco-innovation in the transition to a CE: An analytical literature review. *Journal of Cleaner Production*, *172*, 2999-3018. https://doi.org/10.1016/j.jclepro.2017.11.111

Dewar, R. D., & Dutton, J. E. (1986). The Adoption of Radical and Incremental Innovations: An Empirical Analysis. *Management Science*, *32*(11), 1422-1433. doi:10.1287/mnsc.32.11.1422

Dimos, C., & Pugh, G. (2016). The effectiveness of R&D subsidies: A meta-regression analysis of the evaluation literature. *Research Policy*, *45*(4), 797-815. doi:10.1016/j.respol.2016.01.002

Dosi, G. (1982). Technological paradigms and technological trajectories. *Research Policy*, *11*(3), 147-162. doi:10.1016/0048-7333(82)90016-6

Edwards-Schachter, M. (2018). The nature and variety of innovation. *International Journal of Innovation Studies*, *2*(2), 65-79. doi:10.1016/j.ijis.2018.08.004

Ehie, I. C., & Olibe, K. (2010). The effect of R&D investment on firm value: An examination of US manufacturing and service industries. *International Journal of Production Economics*, *128*(1), 127-135. doi:10.1016/j.ijpe.2010.06.005

Espino-Rodríguez, T. F., & Ramírez-Fierro, J. C. (2018). Managers' attitudes toward hotel outsourcing in a tourist destination. An approach from the benefits and risks perspective. *Tourism Management Perspectives*, *26*, 143-152. https://doi.org/10.1016/j.tmp.2017.10.003

Esposito, M., Tse, T., & Soufani, K. (2018). Introducing a CE: New thinking with new managerial and policy implications. *California Management Review*, *60*(3), 5-19. https://doi.org/10.1177/0008125618764691

Filipe, S. F., Grammatikos, T., & Michala, D. (2016). Forecasting distress in European SME portfolios. *Journal of Banking & Finance*, *64*, 112-135. doi:10.1016/j.jbankfin.2015.12.007

Financieel Dagblad. (2016, February 1). *VVD: Te veel subsidie lekt naar tussenpersonen*. FD.nl. Retrieved June 9, 2020, from https://fd.nl/economie-politiek/1137707/vvd-teveel-subsidie-lekt-naar-tussenpersonen

Fiol, C. M., & Lyles, M. A. (1985). Organizational Learning. *The Academy of Management Review*, *10*(4), 803. doi:10.2307/258048

Fisher, F. M. (1979). "Diagnosing Monopoly." Quarterly Review of Economics and Business. *The Journal of Reprints for Antitrust Law and Economics*, *19*(2), 7-33.

Freel, M. S. (2000). Barriers to Product Innovation in Small Manufacturing Firms. *International Small Business Journal: Researching Entrepreneurship*, *18*(2), 60-80. doi:10.1177/0266242600182003

Gault, F. (2018). Defining and measuring innovation in all sectors of the economy. *Research Policy*, *47*(3), 617-622. doi:10.1016/j.respol.2018.01.007

Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The CE – A new sustainability paradigm? *Journal of Cleaner Production*, *143*, 757-768. doi:10.1016/j.jclepro.2016.12.048

Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on CE: the expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, *114*, 11-32. doi:10.1016/j.jclepro.2015.09.007

Girma, S., Görg, H., & Stepanok, I. (2020). Subsidies, spillovers and exports. *Economics Letters*, *186*, 108840. doi:10.1016/j.econlet.2019.108840

Griffith, R., Huergo, E., Mairesse, J., & Peters, B. (2006). Innovation and Productivity across Four European Countries. doi:10.3386/w12722

Grilli, L., & Murtinu, S. (2018). Selective Subsidies, Entrepreneurial Founders' Human Capital, and Access to R&D Alliances. *Research Policy*, *47*, 1945-1963. doi:10.2139/ssrn.2592408

Guldmann, E., & Huulgaard, R. D. (2020). Barriers to circular business model innovation: A multiple-case study. *Journal of Cleaner Production*, *243*, 118160. doi:10.1016/j.jclepro.2019.118160

Guohui, S., & Yunfeng, L. (2012). The Effect of Reinforcing the Concept of CE in West China Environmental Protection and Economic Development. *Procedia Environmental Sciences*, *12*, 785-792. doi:10.1016/j.proenv.2012.01.349

Gupta, H., & Barua, M. K. (2018). A framework to overcome barriers to green innovation in SMEs using BWM and Fuzzy TOPSIS. *Science of The Total Environment*, *633*, 122-139. doi:10.1016/j.scitotenv.2018.03.173

Hall, B. H., Lotti, F., & Mairesse, J. (2013). Evidence on the impact of R&D and ICT investments on innovation and productivity in Italian firms. *Economics of Innovation and New Technology*, *22*(3), 300-328. doi:10.1080/10438599.2012.708134

Hall, J. (2000). Environmental Supply Chain Dynamics. *Greening the Supply Chain*, 233-249. doi:10.1007/1-84628-299-3_13

Hayter, R., & Clapp, A. (2020). Towards a collaborative (public-private partnership) approach to research and development in Canada's forest sector: an innovation system perspective. *Forest Policy and Economics*, *113*, 102119. doi:10.1016/j.forpol.2020.102119

He, Z., & Wong, P. (2004). Exploration vs. Exploitation: An Empirical Test of the Ambidexterity Hypothesis. *Organization Science*, *15*(4), 481-494. doi:10.1287/orsc.1040.0078

Hillebrand, B., Kemp, R. G., & Nijssen, E. J. (2011). Customer orientation and future market focus in NSD. *Journal of Service Management*, *22*(1), 67-84. doi:10.1108/09564231111106929

Hines, J. R., & Park, J. (2019). Investment ramifications of distortionary tax subsidies. *Journal of Public Economics*, *172*, 36-51. doi:10.1016/j.jpubeco.2018.11.002

Hippel, E. V. (2005). *Democratizing Innovation*. Cambridge, MA: MIT Press. https://web.mit.edu/evhippel/www/books/DI/DemocInn.pdf

Hockerts, K., & Wüstenhagen, R. (2010). Greening Goliaths versus emerging Davids — Theorizing about the role of incumbents and new entrants in sustainable entrepreneurship. *Journal of Business Venturing*, *25*(5), 481-492. doi:10.1016/j.jbusvent.2009.07.005

Hojnik, J., & Ruzzier, M. (2016). Drivers of and barriers to eco-innovation: a case study. *International Journal of Sustainable Economy*, *8*(4), 273. doi:10.1504/ijse.2016.079433

Huber, G. P., & Power, D. J. (1985). Retrospective reports of strategic-level managers: Guidelines for increasing their accuracy. *Strategic Management Journal*, *6*(2), 171-180. doi:10.1002/smj.4250060206

Huergo, E., & Moreno, L. (2017). Subsidies or loans? Evaluating the impact of R&D support programmes. *Research Policy*, *46*(7), 1198-1214. doi:10.1016/j.respol.2017.05.006 Innovation_High_Ground_report_03.pdf

Kaiser, U. (2002). Measuring knowledge spillovers in manufacturing and services: an empirical assessment of alternative approaches. *Research Policy*, *31*(1), 125-144. doi:10.1016/s0048-7333(00)00159-1

Kakaomerlioglu, D. C., & Carlsson, B. (1999). Manufacturing In Decline? A Matter Of Definition. *Economics of Innovation and New Technology*, *8*(3), 175-196. doi:10.1080/10438599900000008

Kaufmann, A., & Tödtling, F. (2002). How effective is innovation support for SMEs? An analysis of the region of Upper Austria. *Technovation*, *22*(3), 147-159. doi:10.1016/s0166-4972(00)00081-x

Kim, W. C., & Mauborgne, R. (2004). Value Innovation: The Strategic Logic of High Growth. *Harvard Business Review*. Retrieved from https://hbr.org/2004/07/value-innovation-the-strategic-logic-of-high-growth

King, N., & Brooks, J. M. (2017). *Template Analysis for Business and Management Students*. Thousand Oaks, CA: SAGE.

Krishnan, V., & Ulrich, K. T. (2001). Product Development Decisions: A Review of the Literature. *Management Science*, *47*(1), 1-21. doi:10.1287/mnsc.47.1.1.10668

Kristensen, H. S., & Mosgaard, M. A. (2020). A review of micro level indicators for a CE – moving away from the three dimensions of sustainability? *Journal of Cleaner Production*, *243*, 118531. https://doi.org/10.1016/j.jclepro.2019.118531

Lach, S., & Sauer, R. M. (2002). R&D, Subsidies and Productivity. *SSRN Electronic Journal*. doi:10.2139/ssrn.296051

Lin, B. C., & Zheng, S. (2016). A new direction in environmental economics. *Journal of Economic Surveys*, *30*(3), 397-402. doi:10.1111/joes.12166

Little, A. D. (2005). How Leading Companies are Using Sustainability-Driven Innovation to Win Tomorrow's Customers. https://www.adlittle.com/sites/default/files/viewpoints/ADL_

Mairesse, J., & Mohnen, P. (2005). The Importance of R&D for Innovation: A Reassessment Using French Survey Data. doi:10.3386/w10897

Malek, J., & Desai, T. N. (2020). A systematic literature review to map literature focus of sustainable manufacturing. *Journal of Cleaner Production*, *256*, 120345. doi:10.1016/j.jclepro.2020.120345

March, J. G. (1991). Exploration and Exploitation in Organizational Learning. *Organization Science*, *2*(1), 71-87. doi:10.1287/orsc.2.1.71

McCarthy, I. P., Tsinopoulos, C., Allen, P., & Rose-Anderssen, C. (2006). New Product Development as a Complex Adaptive System of Decisions. *Journal of Product Innovation Management*, *23*(5), 437-456. doi:10.1111/j.1540-5885.2006.00215.x

Meijer, L., Huijben, J., Van Boxstael, A., & Romme, A. (2019). Barriers and drivers for technology commercialization by SMEs in the Dutch sustainable energy sector. *Renewable and Sustainable Energy Reviews*, *112*, 114-126. doi:10.1016/j.rser.2019.05.050

Meuleman, M., & De Maeseneire, W. (2012). Do R&D subsidies affect SMEs' access to external financing? *Research Policy*, *41*(3), 580-591. doi:10.1016/j.respol.2012.01.001

Miles, M. B., Huberman, A. M., Huberman, M. A., & Huberman, P. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. Thousand Oaks, CA: SAGE.

Miller, C. C., Cardinal, L. B., & Glick, W. H. (1997). Retrospective Reports In Organizational Research: A Re-examination Of Recent Evidence. *Academy of Management Journal*, *40*(1), 189-204. doi:10.5465/257026

Mura, M., Longo, M., & Zanni, S. (2020). CE in Italian SMEs: A multi-method study. *Journal of Cleaner Production*, *245*, 118821. doi:10.1016/j.jclepro.2019.118821

Nawaz, W., & Koç, M. (2018). Development of a systematic framework for sustainability management of organizations. *Journal of Cleaner Production*, *171*, 1255-1274. doi:10.1016/j.jclepro.2017.10.011

Neto, J. C., Filipe, J. A., & Caleiro, A. B. (2019). Creativity and innovation: A contribution of behavioral economics. *International Journal of Innovation Studies*, *3*(1), 12-21. doi:10.1016/j.ijis.2019.06.003

OECD. (2005). *OECD SME and Entrepreneurship Outlook 2005*. Paris, France: OECD Publishing.

OECD. (2009[a]). *Eco-Innovation in Industry Enabling Green Growth: Enabling Green Growth*. Paris, France: OECD Publishing.

OECD. (2009[b]). *Innovation in Firms A Microeconomic Perspective: A Microeconomic Perspective*. Paris, France: OECD Publishing.

OECD. (n.d.[a]). Defining innovation. Retrieved March 14, 2020, from https://www.oecd.org/site/innovationstrategy/defininginnovation.htm

OECD. (n.d.[b]). Research and development (R&D). Retrieved March 14, 2020, from https://www.oecd-ilibrary.org/industry-and-services/research-and-development-r-d/indicator-group/english_09614029-en

Ormazabal, M., Prieto-Sandoval, V., Puga-Leal, R., & Jaca, C. (2018). CE in Spanish SMEs: Challenges and opportunities. *Journal of Cleaner Production*, *185*, 157-167. doi:10.1016/j.jclepro.2018.03.031

Peshkin, A. (1993). The Goodness of Qualitative Research. *Educational Researcher*, *22*(2), 23-29. doi:10.3102/0013189x022002023

Peterson Bishop, A. (1998). Logins and bailouts: Measuring access, use, and success in digital libraries. *The Journal of Electronic Publishing, 4(2). https://doi.org/10.3998/3336431.0004.207*

Pihkala, T., Ylinenpaa, H., & Vesalainen, J. (2002). Innovation barriers amongst clusters of European SMEs. *International Journal of Entrepreneurship and Innovation Management*, *2*(6), 520. doi:10.1504/ijeim.2002.000499

Polzin, F. (2017). Mobilizing private finance for low-carbon innovation – A systematic review of barriers and solutions. *Renewable and Sustainable Energy Reviews*, *77*, 525-535. doi:10.1016/j.rser.2017.04.007

Rabta, B. (2020). An Economic Order Quantity inventory model for a product with a CE indicator. *Computers & Industrial Engineering*, *140*, 106215. doi:10.1016/j.cie.2019.106215

Rahbauer, S., Menapace, L., Menrad, K., & Lang, H. (2018). Determinants for the adoption of green electricity by German SMEs – An empirical examination. *Energy Policy*, *123*, 533-543. doi:10.1016/j.enpol.2018.09.033

Ranta, V., Keränen, J., & Aarikka-Stenroos, L. (2019). How B2B suppliers articulate customer value propositions in the CE: Four innovation-driven value creation logics. *Industrial Marketing Management*. doi:10.1016/j.indmarman.2019.10.007

Reid, M., & Brady, E. (2012). Improving firm performance through NPD: The role of market orientation, NPD orientation and the NPD process. *Australasian Marketing Journal (AMJ)*, *20*(4), 235-241. doi:10.1016/j.ausmj.2012.05.011

Repo, P., Anttonen, M., Mykkänen, J., & Lammi, M. (2018). Lack of Congruence between European Citizen Perspectives and Policies on CE. *European Journal of Sustainable Development*, *7*(1), 249-264. doi:10.14207/ejsd.2018.v7n1p249

Rijksdienst voor Ondernemend Nederland. (2020). *Subsidie- en financieringswijzer*. Rijksdienst voor Ondernemend Nederland. Retrieved June 16, 2020, from https://www.rvo.nl/subsidie-en-financieringswijzer

Rijksoverheid. (2016). *Nederland circulair in 2050*. Retrieved from http://rijksoverheid.nl/circulaire-economie

Rijksoverheid. (2019, July 10). ? 80 miljoen extra voor circulaire economie. Retrieved January 31, 2020, from https://www.rijksoverheid.nl/actueel/nieuws/2019/07/10/%E2%82%AC-80-miljoen-extra-voor-circulaire-economie

Rijksoverheid. (n.d.[a]). Nederland circulair in 2050. Retrieved January 31, 2020, from https://www.rijksoverheid.nl/onderwerpen/circulaire-economie/nederland-circulair-in-2050

Rijksoverheid. (n.d.[b]). Noodzaak van circulaire economie. Retrieved January 31, 2020, from https://www.rijksoverheid.nl/onderwerpen/circulaire-economie/noodzaak-van-circulaire-economie

Rizos, V., Behrens, A., Van der Gaast, W., Hofman, E., Ioannou, A., Kafyeke, T., … Topi, C. (2016). Implementation of CE Business Models by Small and Medium-Sized Enterprises (SMEs): Barriers and Enablers. *Sustainability*, *8*(11), 1212. doi:10.3390/su8111212

Sandberg, B., & Aarikka-Stenroos, L. (2014). What makes it so difficult? A systematic review on barriers to radical innovation. *Industrial Marketing Management*, *43*(8), 1293-1305. doi:10.1016/j.indmarman.2014.08.003

Sarantakos, S. (2005). *Social Research*. London, United Kingdom: Palgrave Macmillan. https://www.macmillanihe.com/resources/sample-chapters/9780230295322_sample.pdf

Schaltegger, S., & Wagner, M. (2011). Sustainable entrepreneurship and sustainability innovation: categories and interactions. *Business Strategy and the Environment*, *20*(4), 222-237. doi:10.1002/bse.682

Schot, J., Kanger, L., & Verbong, G. (2016). The roles of users in shaping transitions to new energy systems. *Nature Energy*, *1*(5). doi:10.1038/nenergy.2016.54

Schumpeter, J. A. (1934). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. New Brunswick, NJ: Transaction Publishers.

Shlay, A. B., Weinraub, M., Harmon, M., & Tran, H. (2004). Barriers to subsidies: Why low-income families do not use child care subsidies. *Social Science Research*, *33*(1), 134-157. https://doi.org/10.1016/s0049-089x(03)00042-5

Singh, S. K., Gupta, S., Busso, D., & Kamboj, S. (2019). Top management knowledge value, knowledge sharing practices, open innovation and organizational performance. *Journal of Business Research*. doi:10.1016/j.jbusres.2019.04.040

Sofaer, S. (1999). Qualitative methods: what are they and why use them? *Health services research*, *34*, 1101.

Sopjani, L., Stier, J. J., Ritzén, S., Hesselgren, M., & Georén, P. (2019). Involving users and user roles in the transition to sustainable mobility systems: The case of light electric vehicle sharing in Sweden. *Transportation Research Part D: Transport and Environment*, *71*, 207-221. doi:10.1016/j.trd.2018.12.011

Souder, W. E., & Chakrabarti, A. K. (1978). The R&D/marketing interface: Results from an empirical study of innovation projects. *IEEE Transactions on Engineering Management*, *EM-25*(4), 88-93. doi:10.1109/tem.1978.6447302

Stahl, B. C., Chatfield, K., Ten Holter, C., & Brem, A. (2019). Ethics in corporate research and development: can responsible research and innovation approaches aid sustainability? *Journal of Cleaner Production*, *239*, 118044. doi:10.1016/j.jclepro.2019.118044

Starman, A. B. (2013). The case study as a type of qualitative research. *Journal of Contemporary Educational Studies*, *1*, 23-43.

Steiner, G. (2008). Supporting sustainable innovation through stakeholder management: a systems view. *International Journal of Innovation and Learning*, *5*(6), 595. doi:10.1504/ijil.2008.019143

Swanborn, P. (2010). *Case Study Research: What, Why and How?* London, UK: SAGE publications Ltd. doi:10.4135/9781526485168

Swanson, R. A., & Holton, E. F. (2005). *Research in Organizations: Foundations and Methods in Inquiry*. Oakland, CA: Berrett-Koehler Publishers.

Symon, G., & Cassell, C. (2012). *Qualitative Organizational Research: Core Methods and Current Challenges*. Thousand Oaks, CA: SAGE.

Terán-Yépez, E., Marín-Carrillo, G. M., Casado-Belmonte, M. D., & Capobianco-Uriarte, M. D. (2020). Sustainable entrepreneurship: Review of its evolution and new trends. *Journal of Cleaner Production*, *252*, 119742. doi:10.1016/j.jclepro.2019.119742

Tiwari, R., & Buse, S. (2007). Barriers to Innovation in SMEs: Can the Internationalization of R&D Mitigate Their Effects? *Proceedings of the First European Conference on Knowledge for Growth: Role and Dynamics of Corporate R&D*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1583446

Trischler, J., Johnson, M., & Kristensson, P. (2020). A service ecosystem perspective on the diffusion of sustainability-oriented user innovations. *Journal of Business Research*. doi:10.1016/j.jbusres.2020.01.011

Tsai, K., & Liao, Y. (2016). Sustainability Strategy and Eco-Innovation: A Moderation Model. *Business Strategy and the Environment*, *26*(4), 426-437. doi:10.1002/bse.1926

Tsao, Y., Lee, P., Chen, C., & Liao, Z. (2017). Sustainable newsvendor models under trade credit. *Journal of Cleaner Production*, *141*, 1478-1491. doi:10.1016/j.jclepro.2016.09.228

Tseng, M., Chiu, A. S., Liu, G., & Jantaralolica, T. (2020). CE enables sustainable consumption and production in multi-level supply chain system. *Resources, Conservation and Recycling*, *154*, 104601. doi:10.1016/j.resconrec.2019.104601

Tura, N., Hanski, J., Ahola, T., Ståhle, M., Piiparinen, S., & Valkokari, P. (2019). Unlocking circular business: A framework of barriers and drivers. *Journal of Cleaner Production*, *212*, 90-98. doi:10.1016/j.jclepro.2018.11.202

United Nations Environment Programme (UNEP). (2003). Energy subsidies: Lessons learned in assessing their impact and designing policy reforms. UNEP/Earthprint. http://wedocs.unep.org/bitstream/handle/20.500.11822/8079/-Energy%20Subsidies_%20Lessons%20Learned%20in%20Assessing%20their%20Impact%20and%20Designing%20Policy%20Reforms-20031126.pdf?sequence=2&isAllowed=y

United Nations. (2020). *Sustainable Development Knowledge Platform*. Retrieved February 25, 2020, from https://sustainabledevelopment.un.org/

Van de Ven, A. H. (1986). Central Problems in the Management of Innovation. *Management Science*, *32*(5), 590-607. doi:10.1287/mnsc.32.5.590

Wang, Q., & Zhang, F. (2020). Does increasing investment in research and development promote economic growth decoupling from carbon emission growth? An empirical analysis of BRICS countries. *Journal of Cleaner Production*, *252*, 119853. doi:10.1016/j.jclepro.2019.119853

Weelwright, S. C., & Clark, K. B. (1992). Creating product plans to focus product development. *Harvard Business Review*. Retrieved from https://hbr.org/1992/03/creating-project-plans-to-focus-product-development

Whitley, S. (2013). Time to change the game: Fossil fuel subsidies and climate. London: Overseas Development Institute. https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8668.pdf

Xu, L., Zhang, Q., Wang, K., & Shi, X. (2020). Subsidies, loans, and companies' performance: evidence from China's photovoltaic industry. *Applied Energy*, *260*, 114280. doi:10.1016/j.apenergy.2019.114280

Yan, Z., & Li, Y. (2018). Signaling through government subsidy: Certification or endorsement. *Finance Research Letters*, *25*, 90-95. doi:10.1016/j.frl.2017.10.007

Yazan, B., & De Vasconcelos, T. D. (2016). Three Approaches to Case Study Methods in Education: Yin, Merriam, and Stake. *Revista Meta: Avaliação*, *8*(22), 149. doi:10.22347/2175-2753v8i22.1038

Yin, R. K. (2009). *Case Study Research: Design and Methods*. Thousand Oaks, CA: SAGE.

Yin, R. K. (2012). Case study methods. *APA handbook of research methods in psychology*, *2*, 141-155. doi:10.1037/13620-009

Yin, R. K. (2017). *Case Study Research and Applications: Design and Methods*. Thousand Oaks, CA: SAGE Publications.

Zhang, D., & Xu, G. (2018). Does Government Subsidy Affect Firm Survival? Evidence from Chinese Manufacturing Firms. *Emerging Markets Finance and Trade*, *55*(11), 2628-2651. doi:10.1080/1540496x.2018.1530655

Appendices

Appendices will not be provided for this public version.