Utrecht University

Towards a circular economy: decision making of managers in uncertain investment situations

An interdisciplinary study into factors that influence managers' decision making regarding investment in circularity

Master thesis

Yuri Herder

6012590

June 29th 2018

Sociology: Contemporary Social Problems

Faculty of Social and Behavioural Sciences

Utrecht University

Supervisor: prof. dr. ir. Vincent Buskens

Second reader: prof. dr. Arnout van de Rijt

Acknowledgements

I would like to thank my family and friends for all the support they have given me during both my bachelor and master studies. Furthermore, there are several people I would like to express my gratitude to.

First, ABN AMRO for providing me with an internship at the Sustainable Banking department. I learned a lot during my time here and I had excellent supervision on both my internship and thesis activities. I would like to thank Lea Zeemans and Tjeerd Krumpelman for giving me the opportunity to work for this department. Also, I would like to thank Jan Raes for the supervision and the knowledge about sustainability and circularity over the last five months and Hein Brekelmans for helping me out with several thesis- and internship-related aspects. I owe a lot to Iris Mekers and Peter Mulder for giving me the opportunity to work with them on a research project, which provided the data I needed for this thesis. And lastly, I would hereby like to thank the entire Sustainable Banking department for teaching me and showing me very much about different environmental, social and ethical sustainability aspects.

Secondly, I would like to thank my thesis supervisor Vincent Buskens, who taught me a lot and helped me out during the process of this thesis in my late study years. Furthermore, I would like to express my gratitude to my fellow students Jorik Weustink, Floris Bots, Marnix Heijsman, Arjan Houwers, Issie Smith, Esther Pluijmen and Lotte Boersen and the master's coordinators Stefan Soeparman and Joram Pach for the support during this master's year.

Abstract

This study examined factors that influence managers' decision making regarding investment in circularity. All of the surveyed managers were (co-)responsible for financial business within their organisations, that are based in the Netherlands. In the fight against resource exhaustion it is of major importance, that organisations invest in new business models that are based on circularity rather than on linearity of resources. As a baseline assumption of this study managers are expected to be less likely to invest in circularity as these kinds of investments are expected to have lower or even negative benefits. At the same time, as this is not a fixed outcome and the investments could be profitable as well, managers' decisions are affected by several influences in the decision making process towards investment. Through this study – based on multidisciplinary theories - new insights are presented regarding these influences. By finding hurdles and opportunities, influential actors, like financial institutions, are provided with information. Consequently, they come to understand how to approach organisations with regard to investments in circularity. In this way, this study forms a contribution to the transition towards a circular economy and also to the fight against resource exhaustion. A linear regression analysis examining 349 Dutch managers has found five factors to be positively or negatively influencing managers' decision making with regard to investment in circularity. Financial risk perception, attitudes towards environmental concerns in general and the extent to which managers are influenceable, have been found to be hurdles for managers' decision making. Subjective norms on investment in circularity from outside the organisation and the perception of opportunities have been found to be opportunities for managers' decision making. Also, alternative explanations for theoretically hypothesised mechanisms are elaborated on extensively.

Key words: circular economy, transition, managers, decision making, boundedly rational, investment behaviour, circularity, sustainability, risk, opportunity, resources, attitudes, norms, social influence, environment

1. Introduction 4
1.1 Urgency and Dutch government policy 4
1.2 Managers in situations of incomplete information 5
1.3 Social science explanations in environmental research 6
1.3.1 Organisational behaviour 6
1.3.2 Individual behaviour within organisations 6
1.3.3 Multidisciplinary social theories for understanding environmental behaviour 7
1.4 Research questions 8
1.5 Scientific relevance 9
1.6 Societal relevance 9
2. Understanding circular investment behaviour - theories and hypotheses 10
2.1 Risk seekingness and perceived financial risk 10
2.2 Attitudes towards behaviour 11
2.3 Subjective norms and social influence 12
2.4 Perceived behavioural control 13
3. Methods 10
3.1 Data 14
3.3 Operationalisation 15
3.2.1 Dependent variable 15
3.2.2 Independent variables 16
3.3 Control variable 18
3.4 Assumptions linear regression 19
4. Results 20
4.1 Risk and investment in circularity 21
4.2 Attitudes and investment in circularity 22
4.3 Subjective norms, influenceability and investment in circularity 22
4.4 Perceived control and investment in circularity 23
5. Conclusion 23
6. Discussion 25
7. Policy recommendations 28
7.1 Introduce risk-sharing products 28
7.2 Enable knowledge sharing 29
References 31
Appendix 35
Appendix A - Survey 35

1. Introduction

1.1 Urgency and Dutch government policy

Policies following neoclassical economic models were in great extent responsible for the exponential economic growth since World War II and has brought the Western world its prosperity (Daly, 2005). However, these models and the related policies did not account for the limits of this world. The models assume an unconstrained world. Now, after these years of economic growth constraints are in sight and certain resources are becoming exhausted (Daly, 2005). Problems illustrating the limits of nature are over-production, over-population and global warming: the other side of the coin of economic growth. The 'full' world splits the path to economic growth into another path to ecological collapse. This does not only endanger the level of prosperity and well-being that has been strived for. Worse, it jeopardises the survival of humankind. Transition to an economy based on more realistic models is necessary to reverse this sinister trajectory (Daly, 2005). According to Daly, the economy should be focused on 'qualitative development, as opposed to quantitative growth, and the interdependence of the human economy and global ecosphere'.

In line with Daly's notion of urge about the limits of nature, the Dutch government developed a nationwide program to reach a completely circular economy in 2050 (Rijksoverheid, 2016). First, it is important to mention that there is a difference between circularity and sustainability. These two definitions will be used repeatedly in this research and do overlap but are not the same. This research recognises sustainable business management as an overarching concept with a positive impact on people, planet and profit. This entails an organisation with a healthy profit, treating people honest and as equals, while preserving the environment and its natural resources (World Commission on Environment and Development, 1987). Circularity is a component of sustainability and focuses mainly on preserving the world's natural resources (Lacy & Rutqvist, 2016).

Circular economy is defined by Lacy and Rutqvist (2016) as following: an alternative model decoupling growth from scarce resource use, allowing economic development within natural resource limits of our planet and allowing companies to innovate their services and products to enable customers and users to do 'more with less'. Businesses play an important role in the economy and thus can in great extent contribute to the transition towards a circular economy. The following five circular business models have been developed in order to determine whether companies have circular operations or not: circular inputs as raw material for products, resource recovery out of disposed products or by-products, product lifespan extension by repairing, upgrading and reselling, sharing platforms that enable increased utilization rate of products by enabling shared access and leasing products as a service (Lacy & Rutqvist, 2016). If companies are using one or more of the five business models presented above, their businesses can be considered

circular provided that the overall environmental impact of the following components is positive: (1) CO2 emission reduction; (2) less waste production; (3) less material use; (4) less energy use; (5) less water use (MacArthur, 2013).

1.2 Managers in situations of incomplete information

In this study, managers instead of organisations will be researched to be able to survey more individuals in many different social environments. Cordano and Frieze (2000) also successfully studied managers in the past in a similar research, which showed that individuals within organisations can bring critical ideas and deliver effort necessary for improvements like circular investments (Starik & Rands, 1995). The focus will lie on managers whose responsibilities directly influence the environmental performance of their organisations. While considering investing in a circular business model, managers have limited information about the outcome of the investment. Managers do not know if the investment in the end will be profitable. In this situation of incomplete information there are several factors that can influence decision making of managers (Simon, 1955).

First of all, in these situations of an uncertain outcome of investment there is risk involved. According to several studies about risk, nearly everyone but committed gamblers would rather invest in certainty than in something with a possible risky outcome that has similar expected value (Keys & Schwartz, 2007; Simonsohn, 2009). The tendency to prefer certainty to a risky investment is called risk aversion (Kahneman & Tversky, 2013). A major implication of risk aversion is that people tend to avoid innovation (e.g. investment in circularity). Instead, organisations stick with a strategy that has worked in the past that minimises risk but promotes stagnation of business. In this study it will be examined to what extent risk aversion can be expected to be a hurdle for investment in circularity.

Besides risk, there are other factors that influence managers' decision making in situations of incomplete information. Managers could be affected by their attitudes towards investment in circularity in their decision making (Ajzen, 1991). Furthermore, perceived performance expectations of relevant others in- and outside the organisation could play a significant role (Ajzen, 1991). In uncertain situations social influence could be decisive for managers on how to behave (Friedkin & Johnsen, 1991). Finally, perceived resources and opportunities for investing in circularity could influence the behaviour of managers (Ajzen, 1991). It could be easier for the managers to invest due to the existence of many resources and opportunities, even though the outcome of the investment will be hard to predict.

1.3 Social science explanations in environmental research

1.3.1 Organisational behaviour

Previous research about the impact of organisations on the natural environment mainly focuses on organisational (Lawrence & Morell, 1995; Lober, 1996; Sarkis, Gonzalez-Torre & Adenso-Diaz, 2010; Shelton, 1994), strategic (Aragón-Correa, 1998; Stead & Stead, 1995; Delmas & Toffel, 2008; Branzei et al., 2004), interorganisational (Clair, Milliman, & Mitroff, 1995; Turcotte, 1995), regulatory (Getz, 1993), and sustainability perspectives (Hart, 1997; Shrivastava, 1995). Sociological aspects within the varying results of these different disciplines will be briefly described.

Organisational research found training on the relationship between stakeholder pressures and environmental practices in the automotive sector to have a mediating effect. Organisations would only adopt environmental practices if training programs were in effect: if there would be enough knowledge about these practices (Sarkis, Gonzalez-Torre & Adenso-Diaz, 2010). Furthermore, research showed that communication barriers between business managers and environmental managers are the principal impediment for strategic environmental management initiatives. This means that the environmental manager fails to communicate the business benefits to the business managers (Shelton, 1994).

Different strategic studies found that top-down influences are stronger than bottom-up influences in early stages of green strategy formation: the interpretation of benefits by executives determines the process of this formation (Branzei et al., 2004). Studies also showed a dependency between organisational structure and the formation of environmental strategies. Differences in managers' receptivity to external environmental pressures emerge because organisations channel these pressures through different organizational functions, such as legal affairs and marketing departments (Delmas & Toffel, 2008).

Interorganisational research taught us that governments, businesses and public interest groups need to work together to increase incentives for environmental practices. These incentives would lower barriers to greater source reduction and other environmental management methods (Turcotte, 1995).

Finally, sustainability scholars researched how large organisations could use the power they have to positively impact the earth's ecosystem. The conclusion was that organisations should integrate environmental sustainability into the logics of the organisation. Sustainability should be an integral aspect of the organisation according to these studies (Hart, 1997; Shrivastava, 1995).

1.3.2 Individual behaviour within organisations

Research into drivers of managers for making environmentally responsible decisions has only been conducted several times (Cordano & Frieze, 2000; Marshall, Cordano & Silverman, 2005; González-Benito & González-Benito, 2006). Cordano and Frieze (2000) applied Ajzen's theory of planned behaviour to

understand pollution prevention preferences of environmental managers within organisations. This study found a moderate positive effect from pollution prevention attitudes, subjective norms on environmental regulation and past source reduction activity on environmental managers' preferences to implement source reduction activities. A negative effect was found for behavioural control. This effect was believed to exist, due to the frustration of environmental managers with low control, to have even greater intention than managers with high behavioural control. In this case limited authority, in terms of the organisations environmental performance of the managers, has increased the desire of source reduction activity in the future. The most important findings of this research suggest communication barriers within organisations, like presented above. Whereas overall positive attitudes towards pollution prevention were found, subjective norms (i.e. the social pressure of relevant others) were not found to be exceeding the regulatory norms. Therefore, environmental managers were unable to communicate the positive economic merits of pollution prevention to business managers, consequently making implementations of environmental activities by these business managers unlikely.

Marshall, Cordano and Silverman (2005) researched drivers of environmental behaviour in the US Wine Industry. In an early stage of environmental transition in the wine industry, the study found managerial attitudes and norms, existing regulations, employer welfare and competitive pressures to be all strong drivers of proactive environmental behaviour. However, it is noted that drivers vary in relevance and relative importance, suggesting a consideration of the relationship between drivers of environmentalism and the stage of an industry's environmental transformation.

Lastly, González-Benito and González-Benito (2006) studied factors that determine implementation of environmental practices in the area of logistics management. They found that pressures of non-governmental stakeholders perceived by firms explain the implementation of environmental practices in logistics together with values and beliefs of managers. Part of this effect is channelled through the influence of the values in the perception of environmental pressure.

1.3.3 Multidisciplinary social theories for understanding environmental behaviour

As stated in the previous section, social science provides several explanations for (not) performing environmental behaviour. The influential effect of training, communication barriers, top-down influences, receptivity to external environmental pressures and norms, illustrate that *group processes* have a major impact on environmental behaviour. Sociological, social psychological and economic theories are thus important for understanding this kind of behaviour.

However, multidisciplinary elaboration of these theories on this subject still has to occur. Furthermore, previous studies did not deal with influences in situations of incomplete information as such. This study will apply the multidisciplinary theories to environmental behaviour particularly with regard to

investment in circularity. In the following section, research questions will be introduced that will provide new insights regarding factors that influence the performance of environmental behaviour.

1.4 Research questions

The goal of this research is to identify hurdles and opportunities that managers face in the uncertain process of investing in circularity and to provide policy recommendations to respond to influences within this process. The research question this study will try to answer is the following:

Which factors influence managers' decision making regarding investing in circularity?

In order to answer the research question, three facilitating questions have been formulated: a descriptive, an explanatory and a policy recommendation question.

The first, descriptive, question looks at influences in the process towards investing in circularity (i.e. the studied behaviour). This question will be broadly formulated in order to cover all determining concepts: 'What do factors that influence investing in circularity look like?' The answer of this question will provide a description of influences. The explanatory question aims at comprehending mechanisms between these influences. This second question will be concerned with explaining how these influences are able to determine the studied behaviour: 'How do these components determine managers' behaviour to invest in circularity?' Finally, the policy recommendation question will be examined in order to provide influential actors, like financial institutions, with information to understand how to approach organisations with regard to investments in circularity.

This study considers financial institutions particularly influential, as they are the starting point of every investment. If an organisation considers investing in circularity, it consults a financial institution to discuss financing possibilities. Therefore, these institutions could play a major role in the decision making process of managers. By identifying factors that influence managers' decision making, policy recommendations regarding these factors could be provided and financial institutions could be informed on how to respond to these influences. This will make it easier for these institutions to steer their clients towards circular business models and reach their own organisational goals regarding this subject. The policy recommendation question will be the following: 'How to help and motivate managers in the process of investing in circularity within their organisations?' Answering this question can have a positive impact on circularity targets of all involved organisations.

1.5 Scientific relevance

Besides rather general research into organisational behaviour with regard to the natural environment, more relevant studies about drivers of environmentally responsible decisions have been conducted. However, most of the latter studies have focused primarily on a psychological perspective. The distinctiveness of this study is the more interdisciplinary perspective on similar behaviour. The influences that play part in the decision making process of managers with regard to investments with uncertain outcomes will be examined in greater depth. To elaborate on Ajzen's (1991) rather psychological theory, sociological and socio-economic theories are used to understand decision making behaviour with regard to investments in circularity.

None of the existing literature discusses investment behaviour in such an interdisciplinary way. This study contributes to academic literature by providing insights about determinants of circularity investment behaviour substantiated by psychological, sociological and socio-economic theories. The interdisciplinary-boundedly rational decision theories (Simon, 1955) that will be used are; the theory of planned behaviour (Ajzen, 1991), social influence network theory (Friedkin & Johnsen, 1990) and expected utility theory (Bernoulli, 1954; Kahneman & Tversky, 2013). Together these theories will synergically provide an understanding of social behaviour of managers in situations of incomplete information.

1.6 Societal relevance

The question of societal relevance of this research has been raised in the urgency paragraph of this chapter. Exhaustion of natural resources, which illustrates the limits of the world, has to be countered in order for humankind to survive on this planet. From a societal point of view, learning about influential factors in the decision making process of individuals in organisations will have impact on the environmental performance of businesses.

In this study, environmental performance of businesses will be specifically focused on managers' investment in circularity. As stated in the first chapter, the transition to a circular economy is a major solution to the exhaustion of natural resources. This transition allows economic development within natural resource limits of our planet. Moreover, it allows companies to innovate their services and products to eventually enable customers and users to do 'more with less'. Hence, the transition towards circularity in terms of investments in circular business models has the potential to be impactful and will therefore be an evident focus point within environmental behaviour.

When influential actors are informed by this research and enabled to respond to hurdles and opportunities regarding investment in circularity, more investments in circular business models will follow. Consequently, many organisations will invest in circularity according to Lacy and Rutqvist (2016). This

will contribute in reaching the Dutch government's goal of a completely circular economy in 2050. In the end, this will mitigate the exhaustion of ecological nature as described by Daly (2005) and provide qualitative development of the Dutch economy.

2. Understanding circular investment behaviour - theories and hypotheses

This section applies several relevant theories to considerations of managers towards uncertain circular investment. Theories about boundedly rational decision making (Simon, 1955; 1972) will be used as guidelines for understanding these considerations. In this manner, these theories provide insights about how individuals make decisions in situations where they do not possess complete information about the outcomes of these decisions (Simon, 1955; 1972; 1991; 1997).

As a baseline assumption it is expected that managers are less likely to invest in circularity as these kinds of investments have lower or even negative expected benefits. However, as this is not a fixed outcome and the investments could be profitable as well, it is expected that managers' decisions are affected by several influences in the decision making process towards investment (Simon, 1955; 1972). This chapter will derive expectations of this process from different theories of decision making.

Firstly, differences in perceptions of the probability of financial loss related to an individual's tendency for risk-seeking behaviour, could determine the likelihood of investment in circularity. Secondly, attitudes towards investment in circularity could determine the likelihood of investment in circularity as well. Thirdly, subjective norms on investment in circularity (i.e. social influence) and compliance to these norms could influence managers' decision making regarding investment in circularity. And finally, perceived behavioural control in the form of resources and opportunities of managers could determine whether managers are likely to invest in circularity.

2.1 Risk seekingness and perceived financial risk

Consequences of actions that contain risks, depend on uncertain events such as client acceptance and operational implementation of an investment. Decision making in such situations of incomplete information about the outcome of the investment could be construed as the acceptance of a gamble. In many instances certainty is preferred over a gamble, even when gambles have higher expectations.

Expected utility theory (Bernoulli, 1954) describes the expectation of a monetary gamble as a weighted average where each possible outcome is weighted by its probability of occurrence. For example, an individual has the choice between having €100,- for sure or a 50/50 chance on €220,-. The weighted

average of this monetary gamble is 0.5 X 220 + 0.5 X 0 = €110,-. Although this expectation is higher than the assured gain, in most situations people prefer the assured gain to this gamble. This is called risk aversion. In general, the preference for an assured outcome to a gamble that has higher or equal expectation is called risk aversion. And the rejection of an assured outcome in favour of a gamble of lower or equal expectation is called risk seekingness (Kahneman & Tversky, 2013).

As investments in circularity are considered risky because they entail much uncertainty, it can be assumed that risk-seeking managers invest in circularity sooner than risk-averse managers. Also, if managers perceive the financial risk to be low, it can be assumed that managers invest in circularity sooner. If the perceived risk is very low, risk seekingness or aversion will hardly matter because there is hardly any risk involved. However, the stronger the risk perceived, the more reluctant risk-averse managers become to invest, while the risk is much less a concern to the less risk-averse or even risk-seeking managers. Therefore, it is expected that the effect of risk seekingness of the managers is especially prominent for investments that are perceived highly risky. The first three sub-hypotheses state what the role of financial risk is in the choice to invest in circularity.

H1a. The more risk-seeking managers are, the more likely they are to invest in circularity.

H1b. The higher the managers' financial risk perception, the less likely they are to invest in circularity.

H1c. The stronger the managers' perceived risk of an investment, the larger the effect of risk seekingness.

2.2 Attitudes towards behaviour

Besides the financial hurdles and opportunities towards investment in circularity that can influence decision making of managers with incomplete information about the outcome of the investment, there are also various possible non-financial, social hurdles and opportunities that are able to do this as well. The theory of planned behaviour (Ajzen, 1991) states that behaviour could be predicted by intention. In turn, intention is determined by three components: attitudes towards performing particular behaviour, subjective norms on behaviour and perceived behavioural control.

Attitudes towards performing an act concern the degree to which an individual has a favourable or unfavourable evaluation of the behaviour in question (Fishbein & Ajzen, 1975). According to the expectancy-value model of attitudes of Fishbein and Ajzen (1975), attitudes develop from the beliefs people hold about the object of the attitude. Beliefs, regarding the attitudes towards behaviour, are formed by association of behaviour with a particular outcome, or with some other attribute, such as the costs incurred by performing the behaviour. By linking the behaviour to these outcomes or attributes, it is valued positively

or negatively and the attitudes towards behaviour is automatically and simultaneously acquired. In this way, individuals have positive attitudes towards behaviour with desirable consequences and negative attitudes towards behaviour with undesirable consequences. If an individual links investing in circularity to long-term value creation and to the benefits for the environment, attitudes towards this behaviour will be positive as well. Vice versa, if an individual links investing in circularity to financial losses and having minor effect on reducing resource exhaustion, attitudes towards this behaviour will be negative.

Previous research has already shown that environmental attitudes can be used to predict environmental behaviour (Cordano & Frieze, 2000; Pooley & O'Connor, 2000; Balderjahn, 1988; Kaiser, Wölfing & Fuhrer, 1999; Conner & Armitage, 1998; Sutton, 1998). It can be expected that attitudes towards investment in circularity work in a similar way. Moreover, attitudes towards environmental concerns in general are also likely to be related to attitudes towards investment in circularity. Therefore, the following two hypotheses describe that both attitudes towards investment in circularity and attitudes towards environmental concerns in general can facilitate the investment in circularity.

H2a. The more positive managers' attitudes towards investment in circularity are, the more likely they are to invest in circularity.

H2b. The more positive managers' attitudes towards environmental concerns in general are, the more likely they are to invest in circularity.

2.3 Subjective norms and social influence

Subjective norms on behaviour are twofold: the influence of social pressure of relevant others that is perceived by an individual to perform or not perform in a certain way (*normative beliefs)* and compliance with these perceived expectations *(motivation to comply)* (Ajzen, 1991). Perceived social pressure and compliance to this pressure can influence decision making of managers in this situation of incomplete information about the outcome of the investment.

According to Friedkin and Johnsen (1990) social influence encompasses the mechanism where individuals weigh their opinions and opinions of relevant others on an issue (e.g. investment in circularity). The individual repetitively modifies his or her opinion until a settled opinion on the issue is formed: consensus. This mechanism fits within Ajzen's theory of planned behaviour (1991) as the opinion of relevant others (e.g. pressures) could be seen as normative beliefs and consensus could be seen as compliance. In a situation where managers are unsure whether to invest in circularity, the opinion of relevant others could inform their decision making.

Following both theories of Ajzen and Friedkin and Johnson the effect of social influence is expected to be stronger when individuals tend to be more influenceable by these opinions. In this case, consensus will be reached more easily as managers tend to comply to the perceived social pressures sooner. Whereas positive subjective norms on investment in circularity could mean an opportunity for the investment in circularity (Ajzen, 1991), previous research showed that negative subjective norms could mean a hurdle for environmental activity as well (Dieleman & de Hoo, 1993; Ashford, 1993). These studies showed that negative norms limited environmental management of organisations to regulatory compliance. Therefore, these norms potentially inhibited pro-environmental practices as these often exceeded regulatory practices. The following sub-hypotheses state that subjective norms on investment in circularity are a hurdle or opportunity for the investment in circularity and describe how the influenceability of managers affects this relationship.

H3a. The more managers believe that relevant others are positive/negative about investment in circularity, the more/less likely they are to invest in circularity.

H3b. The more influenceable managers are, the stronger the effect of subjective norms on the likelihood of managers' investing in circularity.

Note that there are other mechanisms than social influence that could contribute to the confirmation of these hypotheses. According to theories about norms and correlation in behaviour, social influence is not the only possible cause of this phenomenon. Mechanisms of homophily and external factors are able to contribute to correlation in behaviour. Homophily encompasses individuals' forming their networks based on similarities in behaviour (e.g. investment in circularity): 'similarity breeds connection' (McPherson, Smith-Lovin & Cook, 2001). External factors could explain similarities in behaviour when individuals are affected by the same external circumstances (e.g. providing a better world for their children) (Ackland, 2013). As this research uses Ajzen's starting point in explaining managers' investment behaviour, the hypotheses assume social influence as determinant of subjective norms. However, mechanisms of homophily and external factors should be noted as possible alternative explanations for the confirmation of the hypotheses. This point will be addressed in the discussion chapter.

2.4 Perceived behavioural control

Perceived behavioural control is defined as an individual's belief about how easy or difficult the performance of the behaviour will be (Ajzen, 1991). Perceived behavioural control consists of the perceptions of *opportunities* and *resources* with regard to a particular action. The perceived opportunities

and resources regarding investment in circularity can influence decision making of managers in this situation of incomplete information about the outcome of the investment.

Perceived behavioural control works in two ways according to the theory of planned behaviour. Firstly, it affects the intention of an individual combined with the attitudes towards the behaviour and subjective norms. Secondly, together with the intention it determines whether an individual has the ability to perform the behaviour. Perceived resources and opportunities provide additional information about the costs and benefits, and thus about the possible profitability of an investment. If resources and opportunities are perceived as high, this means the investment is estimated to be less costly than when these are perceived as low (Ajzen, 1991; Simon, 1955). This means that managers will invest sooner when provided with more opportunities and resources as these decrease the estimated costs of an investment. The existence of many opportunities in terms of autonomy or investment culture and high resources in terms of budget leads to more possibilities to invest, due to the reduced costs. The next sub-hypotheses describe the relation between perceived behavioural control and investment in circularity.

H4a. The more resources managers perceive to have, the more likely they are to invest in circularity.

H4b. The more opportunities managers perceive to have, the more likely they are to invest in circularity.

3. Methods

3.1 Data

In order to test the hypotheses formulated above, managers of different organisations across different sectors have been surveyed. In total, 349 managers were surveyed. The concepts were measured by a large survey commissioned by a Dutch financial institution and carried out by GfK, a professional market research agency (Appendix 1). GfK used Computer Assisted Web Interviewing sending out 550 invitations with a response of 69%. All of the surveyed managers were (co-)responsible for financial business within their organisations that are based in the Netherlands. The respondents were 57,4% male and 42,6% female, 18 until 77 year old, with an average age of 54 years old. 71% of the respondents do not have any children and the other 29% have one or two children. On several areas this study has been able to investigate a large diversity of financially responsible managers. Further details about the managers are shown in the tables below. Table 1 shows the sector division of the sampled managers. Table 2 shows the organisation size division in terms of annual turnover. Table 3 presents the extent to which managers characterised their organisation as active in sustainable business management.

Table 1. *Sector division of sampled managers* (*n* = 349)

Agriculture	Industry	Real Estate	Trade	Transport	Food	Business Services	Government, Education and Healthcare	Culture, Sport and Recreation
15	14	35	48	9	12	148	47	22

Table 2. *Annual turnover of organisation division of sampled managers* (*n* = 349)

Until €300k	Between €300k and €1m	Between €1m and €2.5m	Between €2.5m and €20m	€20m or more
206	95	29	6	12

Table 3. *Sustainable business management division of sampled managers* (*n* = 349)

Proactive	Active	Reactive	Not active
33	147	98	71

3.2 Operationalisation

3.2.1 Dependent variable

For this study influences are examined that determine the likelihood of managers investing in circularity. In this respect, 'investment in circularity' measures the extent to which the manager has invested in circularity. Respondents have been asked if they do or do not use one (or more) of the five circular business models. Afterwards, the answer to this question was combined with a question of overall environmental impact of this business model on five subjects. When the definition of investment in circularity of Lacy and Rutqvist (2016) as presented in the introduction is used, using one of the five circular business models with overall positive impact on five environmental aspects, 27% of the managers has invested in circularity and 73% of the managers has not. Thus, the results of the study show that overall managers are not likely to invest in circular business models.

The multiplication of the number of used business models and the number of impact subjects determine the extent to which a manager has invested in circularity (Min = 0, Max = 25). This operationalisation method has been chosen over the usage of a dichotomous variable (1 = investment, 0 = no investment), as the former is considered more informative. After creating this variable, a logarithm of investment in circularity has been created (Min = 0, Max = 3.26) as the initial variable contained outliers. Creating a logarithm was preferred to excluding the outliers, since the sample size would not be reduced and therefore data would be more representative. Methodological concerns with regard to the choice of a

continuous and a linear regression rather than a logistic regression will be elaborated on in the discussion section.

3.2.2 Independent variables

The first independent variable is 'risk seekingness'. Risk seekingness was measured by using the following method. An investment scenario was illustrated to the managers: they are able to invest €100.000,- with a 50% chance to lose this investment and a 50% chance to either earn it back or to make a profit. The question that was asked is what the minimal *earnings* would have to be to choose for the gamble. If this amount would be lower than €200.000,- (X .5 + 0 X .5 = €100,-), the manager is risk-seeking (62% of the managers in this sample), if this amount would equal €200.000,-, the manager is risk-neutral (12% of the managers in this sample) and if this amount would be higher than €200.000,-, the manager is risk-averse (26% of the managers in this sample). The following earning options were provided: €100.000,- (no profit), €150.000,- (€50.000,- profit), €200.000,- (€100.000,- profit), €250.000,- (€150.000,- profit), €300.000,- (€200.000,- profit) and more than €300.000,- (more than €200.000,- profit). After data collection, this variable was recoded in a way that the highest minimal earnings represent the lowest degree of risk seekingness (1) and the lowest minimal earnings represented the highest degree of risk seekingness (6). This method is chosen over using a dichotomous variable indicating risk-seeking or not as it is considered to be more informative. The mean of this variable is 4.4, which indicates that overall managers are risk-seeking. This is in line with the percentages presented above.

The second independent variable that was measured is 'perceived financial risk'. This variable was measured on a scale of applicability. The cost-benefit analysis of the respondent was surveyed through two statements on the extent to which the respondent perceives the cost of investment to be higher than the benefits. In this measure both long-term and short-term cost-benefit considerations were taken into account. Both questions were routed from a different question: 'How would you describe your organisation regarding sustainability?' If the managers indicated that they had invested in sustainability at least once, they were routed to the long-term risk-perception statement: 'I do invest in sustainability/circularity to save costs on long-term'. 278 managers were routed to this statement. If the managers indicated that they had never invested in sustainability, they were routed to the short-term risk-perception statement: 'I do not invest in sustainability/circularity because this is too costly on short-term'. 71 managers were routed to this statement. In order to make one risk perception variable while preserving all managers within the sample, the short-term risk perception of the 71 managers was added to the long-term risk-perception of the 278 managers. Methodological concerns with regard to this decision will be elaborated on in the discussion section. This variable shows the extent of risk perception of investment in sustainability/circularity from

low risk (1) to high risk (4). The mean of this variable is 2.63: towards high average risk perception of managers.

The third independent variable is an interaction variable. In a different model, the *moderation effect* of perceived financial risk on the relation between risk seekingness and investment in circularity will be tested. This variable is a multiplication of the two variables (risk seekingness and financial risk perception) above. To enable easier interpretation and meaningfulness of the main effect, both variables were centred before multiplying, by subtracting the means of each case.

The fourth independent variable is 'attitudes towards investment in circularity'. This variable was measured with a five-point Likert scale. A statement about investment in circularity was presented. The extent to which managers have positive (5) or negative (1) feelings towards investment in circularity, determined the attitudes towards this behaviour. The mean of this variable is 3.57. This means that on average managers tend to be positive about investment in circularity.

The fifth independent variable is 'attitudes towards environmental concerns in general'. This variable was measured with a combined six-point Likert scale. A question was asked about the extent to which respondents think it is important (Min = 1, Max = 6) that their bank undertakes sustainable activities on eight subjects (see Appendix 1). The mean of the eight items was calculated to obtain a degree of subjective importance of environmental concerns in general for respondents. This determines the attitudes towards these environmental concerns. Before combining the categories, correlation between the different categories was measured and found to be excellent ($\alpha = .919$). The mean of this variable is 3.71, this means that on average managers tend to be moderately positive about environmental concerns in general.

The sixth, seventh and eight independent variables that were measured, contain 'internal and external subjective norms on investment in circularity' and 'influenceability of managers' (Min = 1, Max = 4). These variables are respectively divided in normative beliefs (subjective norms) and motivation to comply (influenceability), as presented in the theory section above. Globally, scholars measure subjective norms by asking respondents to rate the extent to which 'important others' would approve or disapprove of their performance of a given behaviour. The best correspondence between global measures of subjective norms and belief-based measures is usually obtained by bipolar scoring of normative beliefs and unipolar scoring of motivation to comply (Ajzen & Fishbein, 1980). In this research normative beliefs were measured on a scale of bipolar applicability in terms of perceived pressures inside and outside the organisation with respective statements. Motivation to comply was measured on the same bipolar scale of applicability because of practical considerations within the survey. In the survey both subjective norms on investment in circularity inside and outside the organisations were measured. Afterwards it was found that it was not possible to combine both variables due to the lack of correlation ($\alpha = .514$, $r = .366$). Therefore, internal and external subjective norms on investment in circularity will be analysed separately. The means

of these variables are respectively 1.46 and 1.75. On average, managers perceive moderately low subjective norms on investment in circularity both inside and outside their organisations.

The ninth and tenth independent variables are interaction variables. Again, in a different model the *moderation effect* of influenceability on the relation between internal and external subjective norms on investment in circularity and investment in circularity will be tested. Due to the use of two measures for subjective norms (i.e. internal and external), there were two interaction variables calculated as well. These interaction variables are a multiplication of both kinds of subjective norms and influenceability presented above. To enable easier interpretation and meaningfulness of the main effects, variables were centred before multiplying by subtracting the means of each case.

Finally, the eleventh and twelfth independent variables that were measured, contain perceived behavioural control. Perceived behavioural control consists of perceived resources and perceived opportunities to invest in circularity (Min = 1, Max = 4). Managers were asked to which extent they perceive to have resources and opportunities to invest in circularity within their organisations. The means for these variables are respectively 2.78 and 2.67. This means that on average managers perceive to have moderately high behavioural control.

3.3 Control variable

For this study a control variable is included in order to assess the relationship between the dependent variable and the independent variables. The dichotomous variable ‘not sustainable’ is used because it indicates whether or not a manager’s organisation is interested in sustainability at all. This could be related to many other variables in the survey. Therefore, controlling for this variable will strengthen this analysis. It is based on the following question: ‘How would you describe your organisation with regard to sustainability?’ Managers could indicate that their organisations were proactive, active, reactive or not active with regard to sustainability. The first three options were coded ‘0’ and the latter option was coded ‘1’, as managers indicated their organisation as not active with regard to sustainability with this option. 20% of the managers have indicated that their organisation is not active with regard to sustainability and 80% of the managers indicated their organisation is.

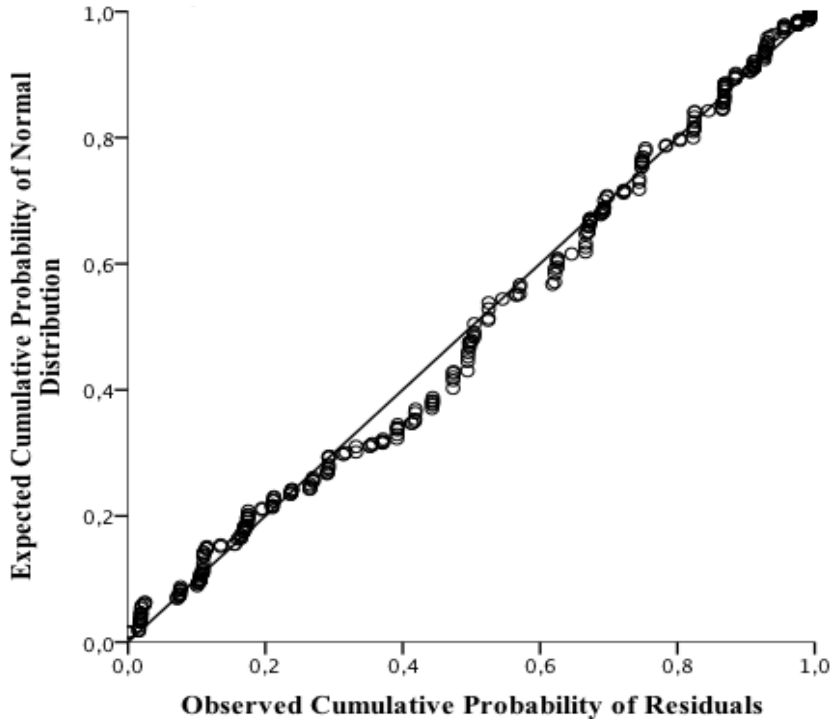
Table 4. *Descriptive statistics (n* = 349)

	Range	M	SD
Investment in circularity	0 – 3.26	.80	.82
Risk seekingness	1 – 6	4.36	1.65
Financial risk perception	1 – 4	2.63	1.07
Attitudes towards investment in circularity	1 – 5	3.57	.83
Attitudes towards environmental concerns in general	1 – 6	3.71	.80
Internal subjective norms	1 – 4	1.46	.71
External subjective norms	1 – 4	1.75	.90
Influenceability	1 – 4	2.21	.92
Perceived resources	1 – 4	2.78	.98
Perceived opportunities	1 – 4	2.67	.93
Risk seekingness * perceived financial risk	-4.61 – 5.48	-.22	1.89
Internal subjective norms * influenceability	-3.07 – 4.55	.02	.48
External subjective norms * influenceability	-2.71 – 4.02	-.07	.80
Not sustainable	0 – 1	.20	

3.4 Assumptions linear regression

To be able to perform a linear regression analysis several assumptions have to be met. Firstly, the relationship between the independent variables and the dependent variable needs to be linear. In addition, outlier effects will be considered. Figure 1 shows the residuals are reasonably normally distributed. This also means that the assumption of homoscedasticity is met. Outliers were present before transforming the initial dependent variable into a logarithm. A box plot shows that the transformation of this initial variable into the logarithm dependent variable had as a consequence that the outlier effect was no longer present.

Figure 1. *P-P plot testing normality of residuals*



Secondly, the independent variables do not show major multicollinearity. This means that the independent variables are not correlated too highly. This can be tested by using three criteria. A correlation matrix shows that none of the independent variables correlate strongly with each other. Overall there is no or weak correlation among the variables and the highest degree of correlation is only moderate (r = .51). Also, Tolerance (Min = .496) and Variance Inflation Factor (Max = 2.015) scores show that there is no multicollinearity present among independent variables.

4. Results

In chapter two, eight hypotheses were formulated based on several multidisciplinary theories. These hypotheses linked several factors to the circular investment behaviour of managers. Two linear regression analysis (n = 349) brought forward partial support for these hypotheses. The following paragraphs will discuss results of the analysis shown below. The results in table 5 show two models; a model in which only the main effects are included (model 1) and a model in which moderation effects are included as well (model 2). The independent variables in both linear regression models of investment in circularity explain 42% of the variance of the dependent variable. In both analysis, there is controlled for whether a manager's organisation is interested in sustainability at all.

Table 5. *Results linear regression of investment in circularity*

	Model 1	**Model 2**
Constant	1.23	1.22
Risk seekingness	.03	.04
Perceived financial risk	-.08*	-.07
Attitudes towards investment in circularity	.06	.05
Attitudes towards environmental concerns in general	-.17**	-.17**
Internal subjective norms	-.03	-.03
External subjective norms	.25**	.26**
Influenceability	-.38**	-.39**
Perceived resources	-.07	-.07
Perceived opportunities	.30**	.29**
Risk seekingness * perceived financial risk		.02
Internal subjective norms & influenceability		-.01
External subjective norms & influenceability		-.01
Not sustainable	-.60**	-.57**

R^2 = .42, * p <.05, **p<.001

4.1 Risk and investment in circularity

Model 1 (table 5) shows that there is no significant effect from risk seekingness on investment in circularity. When a manager is very risk-seeking or risk-averse, it does not necessarily mean that this manager is more or less likely to invest in circularity. The extent to which a manager is risk-seeking is not able to predict investment in circularity. This means H1a is not confirmed.

Furthermore, model 1 shows that financial risk perception has a significant negative effect on investment in circularity, t(348) = -2.17, p = .03. This means that the more a manager perceives an investment in circularity to contain high financial risk, the less likely investment in circularity. This confirms H1b.

Lastly, the linear regression analysis that included the moderation effect (model 2) shows that perceived financial risk does not affect the relationship between risk seekingness and investment in circularity. Risk seekingness of managers has no stronger link to investment in circularity when managers perceive investment in circularity as more risky. This means H1c is not confirmed.

4.2 Attitudes and investment in circularity

Model 1 shows the results of the tested effects on investment in circularity of attitudes towards investment in circularity and environmental concerns in general. Also, in chapter two a relation between both kinds of attitudes was assumed. This assumption was tested with a factor and reliability analysis. Results of these analysis show only a weak correlation between both. This implies that the relation with investment in circularity has to be investigated separately for both dimensions. Results of the linear regression analysis (table 5) show that attitudes towards investment in circularity have no significant effect on investment in circularity. Attitudes towards investment in circularity do not bring managers to actually invest in circularity. This means that H2a is not confirmed.

Meanwhile, attitudes towards environmental concerns in general have a significant negative effect on investment in circularity, $t(348) = -3.68$, $p < .001$. The more positive managers' attitudes towards environmental concerns in general, the less likely they are to invest in circularity. H2b assumes a positive relationship between both variables and therefore this hypothesis is rejected. This reverse effect contradicts with the theoretical expectations. This means that this relationship should be investigated further, which will be reflected upon more elaborately in the conclusion and discussion sections.

4.3 Subjective norms, influenceability and investment in circularity

First, with the linear regression analysis in model 1 (table 5) the effects of both internal and external subjective norms on the likelihood of managers' investing in circularity were tested. Results show that there is only a significant positive effect of external subjective norms on the likelihood of managers' investing in circularity, $t(348) = 5.50$, $p < .001$. This means H3a is only partially confirmed, as it is not possible to predict investment in circularity by means of internal subjective norms. The more a manager perceives norms on investment in circularity outside the organisation to be positive, the more likely investment in circularity.

The linear regression analysis in model 2 tested the moderation effect of influenceability on the effect of both internal and external subjective norms. Results show no significant effect of influenceability on the effect of both internal and external subjective norms on the likelihood of managers' investing in circularity. Both internal and external subjective norms do not have a stronger link to investment in circularity when managers are more influenceable. This means that H3b is not confirmed. However, results of the linear regression analysis in model 1 show a non-hypothesised significant negative direct effect of influenceability on investment in circularity, $t(348) = -7.26$, $p < .001$. Managers who are highly influenceable are less likely to invest in circularity. This is another effect that is not in line with theoretical expectations. This means that this relationship should be investigated further, which will be reflected upon more elaborately in the discussion section as well.

4.4 Perceived control and investment in circularity

Lastly, the effects of perceived resources and perceived opportunities on investment in circularity were tested. Results of the linear regression analysis in model 1 (table 5) show that there was no effect to be found for perceived resources on investment in circularity. This means that the extent to which a manager has the perception to have sufficient money and personnel to invest in circular business models, does not predict investment in circularity. This means H4a is not confirmed.

Meanwhile, perceived opportunities do have a significant positive effect on investment in circularity, $t(348) = 6.44$, $p < .001$. If managers perceive to have sufficient knowledge and time with regard to investing in circularity, they are more likely to invest. This means H4b is confirmed.

5. Conclusion

In this study the factors were examined that affect managers' decision making in situations of incomplete information (i.e. investment in circularity). It has provided insights that can answer the research questions as presented in chapter one.

First, the descriptive question: 'What do factors that influence investing in circularity look like?' A linear regression analysis examining 349 Dutch managers has found five factors to be positively or negatively influencing managers' decision making with regard to investment in circularity. Financial risk perception, attitudes towards environmental concerns in general and the extent to which managers are influenceable, have been found to be hurdles for managers' decision making. Subjective norms on investment in circularity from outside the organisation and the perception of opportunities regarding investment in circularity have been found to be opportunities for managers' decision making. The existence of different other effects on investment in circularity was tested, but not confirmed. The lack of determining these effects does not have as a consequence that the test is not informative, as reasons for not finding these effects are considered useful as well. In the discussion section the possible reasons for not finding the assumed effects will be examined in greater depth. Second, the explanatory question: 'How do these components determine managers' behaviour to invest in circularity?' The remainder of this section will elaborate on this question, answering the main research question as well: 'What factors influence managers' decision making regarding investing in circularity?' Third, the policy question will be answered in chapter seven by giving several policy recommendations.

Managers that perceive the risk of investment in circularity as high, are less likely to invest in it. This means that *financial risk perception* forms an obstacle for an organisation's transition towards circular business models. It is important to notice that the financial risk perception of investment in circularity is found to be significant and the perception of available resources for investment in circularity (e.g. capital,

staff) in an organisation is not. This could mean that in general managers might have the resources to invest in circularity, but the extent to which they are making use of these resources, depends on the degree of perceived financial risk of the investment. Taking away part of the financial risk perception could accelerate the transition towards a circular economy and could therefore be seen as an opportunity. With regard to risk, assumptions based on Bernoulli's expected utility theory (1954) stated that risk seekingness positively affects managers to perform risky investments in circular business models. However, results show that the extent to which a manager is risk-seeking, does not affect the likelihood of investment in circularity. This is even more unexpected given the found negative effect of financial risk perception of these investments, as stated above. Methodological and theoretical concerns with regard to this contradicting finding will be elaborated on in the discussion section.

Positive *attitudes towards environmental concerns in general* are negatively related to investment in circularity. This means that if a manager thinks positively about environmental concerns, this decreases the likelihood of investment in circularity. This finding suggests reverse causality: the more managers are *unable* to invest in circularity within their organisation, the more positive they are about environmental concerns in general. This line of reasoning can also be found in an earlier study of Cordano and Frieze (2000). This study presents that the *inability* of managers to perform pro-environmental practices in their organisation increases their desire to perform these practices. This is similar to the possible reverse causality effect found in the current study: not investing in circularity could possibly be caused by the *inability* to invest, which increases positive attitudes towards environmental concerns in general. Findings of both studies suggest that inability to perform, increases the desire to perform. However, this is merely a possible interpretation of the unexpected negative effect that was found and the discussion section will elaborate further on this unexpected finding. The results shown above show an effect of attitudes towards environmental concerns in general, however another assumed attitudinal effect has not been found. Based on Ajzen's theory of planned behaviour (1991), it was assumed that positive attitudes towards investment increase the likelihood of investment in circularity. However, this concept has not been found to be predictive for investment in circularity. Methodological and theoretical concerns with regard to these deviations from theory will be elaborated on in the discussion.

Perceived opportunities have a significant positive effect on investment in circularity. If managers perceive to have the opportunity, they are more likely to invest. Opportunities in terms of time and knowledge are strongly related to the investment in circularity and could therefore play a major role in the transition to circular business models within an organisation. Knowledge could be related to perceived financial risk as presented above: if managers have a lack of insight into the financial opportunities of investment in circularity, they could perceive the investment as highly risky even when it is not. Besides financial knowledge, technical insight into profitable circular business models could stimulate managers to

invest in these models. The found effect of perceived opportunities means only partial support for the assumed effects of behavioural control on investment in circularity based on Ajzen's theory of planned behaviour (1991). There was found no predictive effect of perceived resources on investment in circularity.

Positive *subjective norms on investment in circularity from outside a manager's organisation* increase the likelihood of managers investing in circularity. This means that positive subjective norms on investment in circularity propagated by managers in other companies, friends and family managers', increase the likelihood of investment in circularity. Subjective norms on investment in circularity inside a managers' organisation have not been found to be predictive for investment in circularity. These findings only partially support the assumed effects of subjective norms on the likelihood of managers' investing in circularity based on Ajzen's theory of planned behaviour (1991). However, the analysis also showed that influenceability has no effect on this relationship, meaning that it does not matter to what extent managers are influenceable when they are affected by these external subjective norms. It was also found that managers who are highly influenceable are less likely to invest in circularity, an unexpected direct negative effect of *influenceability*. As the positive effect of external subjective norms shows that managers do respond to social pressures from outside the organisation, this negative effect is even more unexpected. The hypothesised moderating effect of influenceability based on Friedkin and Johnsen's social influence network theory (1991) was not supported. Possible explanations, methodological and theoretical concerns for this unexpected, contradicting effect will be elaborated in the discussion section.

6. Discussion

In this study important factors have been brought forward that influence managers in risky investment situations related to circularity. The research on this target group was successful, due to the fact that data collection was carried out by a professional research agency. Collaboration with this agency enabled a large sample of 349 managers and useful substantive input about the questions formulated. Furthermore, the sampled managers were considered to be highly relevant for the commissioner of this research, as all of them deal with financial institutions in their profession. This is of importance, as financial institutions are able to make use of the insights provided, by approaching organisations in anticipated ways. In doing so, these institutions are able to take away hurdles and to respond to opportunities. Using the insights this study provided, the financial power that these institutions have, could make a substantial impact in the fight against resource exhaustion. It has to be noted that usually it is very difficult to reach a sample of managers of this size and relevance. While exploring possibilities to reach the desired sample, it has been found to be complex due to privacy, scope and sample diversity considerations. Collaboration with the GfK has been an efficient way to reach the desired sample while bypassing all of these concerns. Apart from the successful

investigation of the target group and substantial impact this study could have, some hypotheses were not confirmed, and some unanticipated relations were discovered.

First, no relationship could be found between attitudes towards investment in circularity and investment in circularity, where it was beforehand expected that a manager's attitudes and behaviour are in line. Descriptive statistics show that overall managers have positive attitudes towards investment in circularity. However, these managers work for organisations and their willingness to invest in circularity does not entail that the organisation is willing to do this as well. A mismatch between managerial attitudes and environmental values of organisations could be an explanation for not finding the assumed relationship. In future research, a measurement of attitudes towards circularity of more than one employee and the organisation as a whole (mission, vision and objectives) could be used to overcome this possible mismatch.

Second, there was found an unexpected effect as for the relationship between attitudes towards environmental concerns in general and investment in circularity. As mentioned in the conclusion section, it is possible that there is reverse causality between these variables: the inability of pursuing pro-environmental desires leads to more positive attitudes towards concerns that relate to these desires. However, this assumption is only based on an application of the findings on previous research. Because this assumption is not proven with substantial evidence, future research should investigate this mechanism more thoroughly. This could be done, for instance, with a longitudinal measurement of attitudes towards environmental concerns in general. In this way, differences in attitudes over time can be related to possible differences in investment behaviour of managers.

Third, after measurement of internal and external subjective norms on investment in circularity it was found to be impossible to combine both variables into one, as there was only weak correlation between these variables. Initially, subjective norms were used as a single concept in the theory and hypotheses section. However, due to practical reasons for the main commissioner of the research, this concept has been divided in two sub-concepts in the survey. To perform the analysis in the way initially desired, combining these separate variables in a single concept seemed most appropriate. When this was found to be impossible due to lack of correlation between both variables, hypothesis 3a had to be tested on an internal and external level rather than on subjective norms on investment in circularity in general. Although this method has not been in line with the theoretical framework presented in chapter two, measuring both kinds of subjective norms separately has proved to be appropriate. Both the lack of correlation and the differences in results indicate that internal and external subjective norms on investment in circularity measure something differently. However, comparison of the results of the used linear regression analysis with a logistic regression analysis shows that the subjective norms related results should be conceived with carefulness. This comparison was performed in order to assess the impact of choosing for the current analysis method on significant results. The results of a logistic regression analysis, with the dichotomous dependent variable

as described in the methods section, show a significant positive effect of internal subjective norms on the likelihood of managers' investing in circularity. This effect replaces the significant positive effect of external subjective norms. This means that, despite of the appropriateness and informativity of the current study, the results regarding subjective norms should be interpreted with caution.

Fourth, results showed a significant negative effect of financial risk perception but no significant effect of risk seekingness on investment in circularity. This is unexpected as both possible predictors concern risk being an influencing factor in decision making. This difference could be caused both by possible measurement errors of risk seekingness and financial risk perception. Using a hypothetical question to measure the extent to which a manager is risk-seeking is more straightforward but less appropriate than measuring an actual behavioural measure, such as an observation. Also, the question that was used to measure risk seekingness was rather complex. This means that managers could have lost interest while answering this question. Observation of managers taking actual risk would be an alternative way to measure this concept in future research. A possible measurement issue with regard to financial risk perception occurred in the survey: a survey routing-related concern. Through survey routing long-term risk perception (n = 278) and short-term risk perception (n = 71) were measured for different subsamples. In order to use the whole sample, both variables measuring financial risk perception in a different way were combined into one variable. Combining two different variables into one could have caused inappropriate measurement of financial risk perception in general. However, both variables relate to risk perception in the same way and therefore this should not be majorly implicating the results of the analysis. One indication for this is, that an analysis using only long-term risk perception (n = 278) led to the same significant effect as the analysis presented in chapter four. Despite the fact that it did not affect the results this time, future research should consider this survey-routing problem and try to prevent it from occurring. Solving this problem during this study has been time-inefficient.

Fifth, in this study an unexpected negative effect of influenceability was found. The more influenceable managers are, the less likely they are to invest in circularity. In addition, managers were found to be influenced to invest in circularity by people outside their organisation, but the extent to which they are influenceable does not affect this relationship. At the same time, both a negative effect of influenceability and a positive effect of external subjective norms on the likelihood of managers' investing in circularity were found. These findings are contradicting. A possible explanation for managers responding to social pressures without being influenceable could be a measurement issue. It is possible that managers gave a socially desirable answer to the question whether or not they consider themselves influenceable, as it was asked rather directly. Managers could have perceived this question as indicating that they do not have a 'backbone', which could trigger them to answer that they usually do not respond to social pressures, when in fact they do. Future research has to investigate the negative effect of influenceability. Furthermore, it has

to consider measurement issues, such as socially desirable answers. To avoid these measurement issues from occurring, influenceability could be measured by deducing it from multiple concepts rather than asking a direct question.

Last, a notion about alternative explanations for similarity in behaviour than social influence from the theory and hypotheses section will be briefly reflected upon. In this study it was found that managers are influenced by people outside their organisation. Therefore, based on findings of this study, there is no evidence that suggests a homophily mechanism, as this mechanism assumes like-mindedness rather than experience of social pressures.

7. Policy recommendations

In order to provide a practical application of this study's findings, the following policy question will be answered below: 'How to help and motivate managers in the process of investing in circularity within their organisations?' Based on the findings of this study, policy recommendations will be given to financial institutions to enable them to accelerate the transition to a circular economy in the fight against resource exhaustion. These recommendations are twofold: introduce risk-sharing products and enable knowledge sharing.

7.1 Introduce risk-sharing products

The first policy recommendation responds to the finding that the higher managers perceive financial risk, the less likely they are to invest in circularity. This finding indicates that financial institutions should introduce risk-mitigating products to lower the risk perception of managers. Financial institutions should start thinking about risk-sharing products for circular financing. With these risk-sharing products, institutions take on and market a share of the financial risk an organisation bears when investing in a circular business model. As the shape of this construction differs per sector, client and circular business model, it has to be given more thought.

This recommendation will provide an example of a risk-sharing product in the case of organisation A, a seller of chairs transiting to a product as a service business (leasing) model. In this example, organisation A has been selling chairs for years but considers transiting to leasing them as a necessary circular transition. Resources for chairs are exhausting and their linear model does not provide the organisation with sustainable competitive advantage any longer. However, the manager that has to decide to invest in this new 'product-as-a-service' business model has not invested in it yet. He generally perceives the financial risk of the investment as too high. The current linear business model delivers direct cash flow as customers pay for the chairs directly. Leasing the chairs for example for three years before taking the

chairs back would mean that organisation A receives small payments over those three years, which contains the risk that the customer can stop paying at any time.

This is where financial institutions should step in, taking over a share of the financial risk that organisation A has over the outstanding credit with customers who leased chairs. In this respect, it is of importance that a small part (+/- 10%) of the financial risk remains at organisation A. In this manner, organisation A has to feel obliged to select suitable candidates for leasing the chairs (e.g. people with an income). Subsequently, the financial institution and the organisation will have mutual dependence. The fee for that financial service can be calculated into the monthly price that organisation A asks for the lease. In this way, the risk financial perception of the decision making manager decreases and the likelihood of him or her investing increases.

7.2 Enable knowledge sharing

The second policy recommendation responds to this study's findings regarding knowledge and perceived social pressures increasing the likelihood that managers invest in circularity. These findings are an indication that financial institutions should enable knowledge sharing with regard to circular investment as this would increase investment in circularity. In addition, the findings show that managers respond to social pressures of people outside their organisation.

Presenting the managers with best practices of investments in circular business models are an example of the impact of a circular business model on an organisation in terms of possibilities and opportunities. Knowledge about these possibilities and opportunities could possibly take away high financial risk perception with regard to investment in circularity. As this kind of investment is relatively new, it could be a rather abstract concept for managers. Sector bankers within financial institutions could provide sector-specific best practices that make the circular business models more tangible and imaginable and therefore relevant for managers.

For example, a manager in a logistics company is not concerned with circularity as he or she thinks circularity is not relevant for his service-oriented sector. A financial institution could present this manager with a success story of another logistics company that has made major sustainable profit from its circular business model by repairing its trucks every other year with used truck-components instead of buying new ones. By doing this the logistics company also anticipated on future regulations that penalise exhaustion of resources for new trucks. In this way, the financial institution is able to make circular investment more relevant for this manager by letting knowledge inspire him or her to invest. This approach could also stimulate managers that are sceptical about circular business models to invest in these models. Using best practices could reframe this sceptical perception, by showing that these business models improve the long-term value creation of an organisation compared to linear business models.

Besides knowledge sharing with best practices, financial institutions could enable knowledge sharing by providing physical (meeting places) and digital circularity-oriented platforms, a place where managers can meet and share knowledge. Gain of knowledge about possibilities and opportunities in combination with the response to social pressures of these managers could increase investment in circularity of managers using these platforms. Since the financial institution owns the platform, it would be thought of first to finance the investment.

References

Ackland, R. (2013). *Web Social Science: Concepts, Data and Tools for Social Scientists in the Digital Age*. London: Sage.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179-211.

Ajzen, I., & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Aragón-Correa, J. A. (1998). Strategic Proactivity and Firm Approach to the Natural Environment. *Academy of Management Journal*, *41*(5), 556-567.

Ashford, N. A. (1993). Understanding Technological Responses of Industrial Firms to Environmental Problems: Implications for Government Policy. In J. Schot & K. Fischer (Eds.), *Environmental Strategies for Industry: International Perspectives on Research Needs and Policy Implications*: 277-310. Washington, DC: Island Press.

Balderjahn, I. (1988). Personality Variables and Environmental Attitudes as Predictors of Ecologically Responsible Consumption Patterns. *Journal of Business Research*, *17*(1), 51-56.

Bernoulli, D. (1954). Exposition of a New Theory on the Measurement of Risk. *Econometrica, 22*(1), 23-36.

Branzei, O., Ursacki-Bryant, T. J., Vertinsky, I., & Zhang, W. (2004). The Formation of Green Strategies in Chinese Firms: Matching Corporate Environmental Responses and Individual Principles. *Strategic Management Journal*, *25*(11), 1075-1095.

World Commission on Environment and Development. (1987). *Our Common Future*. Oxford: Oxford University Press.

Clair, J. A., Milliman, J., & Mitroff, I. I. (1995). Clash or Cooperation? Understanding Environmental Organizations and their Relationship to Business. In D. Collins & M. Starik (Eds.), *Research in Corporate Social Performance and Policy*: 163-194. Greenwich, CT: JAI Press.

Conner, M., & Armitage, C. J. (1998). Extending the Theory of Planned Behavior: A Review and Avenues for Further Research. *Journal of Applied Social Psychology*, *28*(15), 1429-1464.

Cordano, M., & Frieze, I. H. (2000). Pollution Reduction Preferences of US Environmental Managers: Applying Ajzen's Theory of Planned Behavior. *Academy of Management Journal*, *43*(4), 627-641.

Daly, H. E. (2005). Economics in a Full World. *Scientific American*, *293*(3), 100-107.

Delmas, M. A., & Toffel, M. W. (2008). Organizational Responses to Environmental Demands: Opening the Black Box. *Strategic Management Journal, 29*(10), 1027-1055.

Dieleman, H., & de Hoo, S. (1993). Towards a Tailor-Made Process of Pollution Prevention and Cleaner Production: Results and Implications of the PRISMA Project. In J. Schot & K. Fischer (Eds.), *Environmental Strategies for Industry: International Perspectives on Research Needs and Policy Implications*: 245-276. Washington, DC: Island Press.

Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.

Friedkin, N. E., & Johnsen, E. C. (1990). Social Influence and Opinions. *Journal of Mathematical Sociology*, *15*(3-4), 193-206.

Getz, K. A. (1993). Corporate Political Tactics in a Principal-Agent Context: An Investigation in Ozone Protection Policy. *Research in Corporate Social Performance and Policy*, *14*, 19-55.

González-Benito, J., & González-Benito, Ó. (2006). The Role of Stakeholder Pressure and Managerial Values in the Implementation of Environmental Logistics Practices. *International Journal of Production Research*, *44*(7), 1353-1373.

Hart, S. L. (1997). Beyond Greening: Strategies for a Sustainable World. *Harvard Business Review*, *75*(1), 66-77.

Kahneman, D., & Tversky, A. (2013). Choices, Values, and Frames. In *Handbook of the Fundamentals of Financial Decision Making: Part I*, 269-278.

Kaiser, F. G., Wölfing, S., & Fuhrer, U. (1999). Environmental Attitude and Ecological Behaviour. *Journal of Environmental Psychology*, *19*(1), 1-19.

Keys, D. J., & Schwartz, B. (2007). "Leaky" Rationality: How Research on Behavioral Decision Making Challenges Normative Standards of Rationality. *Perspectives on Psychological Science*, *2*(2), 162-180.

Lacy, P., & Rutqvist, J. (2016). *Waste to Wealth: The Circular Economy Advantage*. New York, NY: Springer.

Lawrence, A. T., & Morell, D. (1995). Leading-Edge Environmental Management: Motivation, Opportunity, Resources, and Process. *Research in Corporate Social Performance and Policy*, *1*, 99-127.

Lober, D. J. (1996). Evaluating the Environmental Performance of Corporate. *Journal of Managerial Issues*, 184-205.

MacArthur, E. (2013). Towards the Circular Economy. *Journal of Industrial Ecology*, 23-44.

Marshall, R. S., Cordano, M., & Silverman, M. (2005). Exploring Individual and Institutional Drivers of Proactive Environmentalism in the US Wine Industry. *Business Strategy and the Environment*, *14*(2), 92-109.

McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a Feather: Homophily in Social Networks. *Annual Review of Sociology*, *27*(1), 415-444.

Pooley, J. A., & O'Connor, M. (2000). Environmental Education and Attitudes: Emotions and Beliefs are What is Needed. *Environment and Behavior*, *32*(5), 711-723.

Rijksoverheid. (2016). *Nederland Circulair in 2050. In het Kort.* Den Haag: Rijksoverheid.

Sarkis, J., Gonzalez-Torre, P., & Adenso-Diaz, B. (2010). Stakeholder Pressure and the Adoption of Environmental Practices: The Mediating Effect of training. *Journal of Operations Management*, *28*(2), 163-176.

Shelton, R. (1994). Hitting the Green Wall: Why Corporate Programs Get Stalled. *Corporate Environmental Strategy*, *2*(2), 5-11.

Shrivastava, P. (1995). The Role of Corporations in Achieving Ecological Sustainability. *Academy of Management Review*, *20*(4), 936-960.

Simon, H. A. (1955). A Behavioral Model of Rational Choice. *The Quarterly Journal of Economics*, *69*(1), 99-118.

Simon, H. A. (1991). Bounded Rationality and Organizational Learning. *Organization Science*, *2*(1), 125-134.

Simon, H. A. (1997). *Models of Bounded Rationality: Empirically Grounded Economic Reason* (Vol. 3). Massachusetts, MA: MIT Press.

Simon, H. A. (1972). Theories of Bounded Rationality. *Decision and Organization*, *1*(1), 161-176.

Simon, H. A. (1990). Bounded Rationality. In *Utility and Probability:* 15-18. London: Palgrave Macmillan.

Simonsohn, U. (2009). Direct Risk Aversion: Evidence from Risky Prospects Valued Below Their Worst Outcome. *Psychological Science*, *20*(6), 686-692.

Smythe, P. C., & Brook, R. C. (1980). Environmental Concerns and Actions: A Social-Psychological Investigation. *Canadian Journal of Behavioural Science/Revue Canadienne des Sciences du Comportement*, *12*(2), 175.

Starik, M., & Rands, G. P. (1995). Weaving an Integrated Web: Multilevel and Multisystem Perspectives of Ecologically Sustainable Organizations. *Academy of Management Review*, *20*(4), 908-935.

Stead, W. E., & Stead, J. G. 1995. An Empirical Investigation of Sustainability Strategy Implementation in Industrial Organizations. In D. Collins & M. Starik (Eds.), *Research in Corporate Social Performance and Policy*: 43-66. Greenwich, CT: JAI Press.

Stern, P. C. (1992). Psychological Dimensions of Global Environmental Change. *Annual Review of Psychology*, *43*(1), 269-302.

Stutzman, T. M., & Green, S. B. (1982). Factors Affecting Energy Consumption: Two Field Tests of the Fishbein-Ajzen Model. *The Journal of Social Psychology*, *117*(2), 183-201.

Sutton, S. (1998). Predicting and Explaining Intentions and Behavior: How Well are we Doing? *Journal of Applied Social Psychology*, *28*(15), 1317-1338.

Turcotte, M. 1995. Conflict and Cooperation: The Interfaces Between Environmental Organizations and Business Firms. In D. Collins & M. Starik (Eds.), *Research in Corporate Social Performance and Policy*: 195-230. Greenwich, CT: JAI Press

Vining, J., & Ebreo, A. (1992). Predicting Recycling Behavior from Global and Specific Environmental Attitudes and Changes in Recycling Opportunities. *Journal of Applied Social Psychology*, *22*(20), 1580-1607.

World Commission on Environment and Development. (1987). *Our Common Future*. Oxford: Oxford University Press.

Appendix

Appendix A - Survey

Questionnaire

Duurzaamheid

<Basic survey information>

Length of interview: 10 minutes

Uitleg bij de codes om type vraag aan te geven:

- *S = Single vraag – slechts één antwoord mogelijk*
- *M = Multiple vraag – meerdere antwoorden mogelijk*
- *Q = Numerieke vraag – er moet een getal ingevuld worden*
- *O = Open vraag – vrij invulveld waarin tekst wordt getypt*
- *OL = Open listing – kleine tekst velden voor invullen namen/merken/producten*

III. MAIN QUESTIONNAIRE

A. Belang en involvement bij duurzaamheid

Base: all respondents

A01 [O]

Wat verstaat u onder duurzaam ondernemen?

SCRIPTER: after answering this question not able to go back

Base: all respondents

A02 [S]

Hoe zou u uw organisatie omschrijven als het om duurzaamheid <i> gaat?

Mouse-over for 'duurzaamheid':

In dit onderzoek verstaan we onder duurzaamheid bedrijfsvoering met een positieve impact op people, planet en profit. Dit betekent een bedrijf met gezonde winst, waarbij mensen eerlijk worden behandeld en het milieu en natuurlijke grondstoffen behouden blijven.

1. *Wij zijn proactief en vaak één van de eersten in de sector bij het investeren in duurzaamheid*
2. *Wij volgen de ontwikkelingen actief en investeren in duurzame maatregelen als ze gangbaar worden*
3. *Wij zijn reactief en voeren duurzame maatregelen door als dat echt van ons verlangd wordt*
4. *Wij doen weinig tot niets aan duurzaam ondernemen*

Base: all respondents

A03 [S per row]

Hieronder staan een aantal manieren waarop een organisatie zich bezig kan houden met duurzaamheid. Kunt u aangeven of uw organisatie zich daarmee bezighoudt of dat van plan is?

Rolling grid, aspects in rows (randomize)

1. *Het reduceren van de CO2-uitstoot in het productieproces*
2. *Efficiënt met energie omgaan in bedrijfsgebouwen (bijvoorbeeld door middel van zonnepanelen en isolatie)*
3. *Vervoer en transport zo inrichten dat hierbij zo min mogelijk CO2 wordt uitgestoten*
4. *Efficiënt gebruikmaken van grondstoffen door middel van circulariteit (efficiënte omgang met natuurlijke grondstoffen)*
5. *In de bedrijfsvoering iets terugdoen voor anderen (social return) <i>*
6. *Aandacht voor duurzaamheid bij uw inkoopbeleid*
7. *Aandacht voor duurzaamheid bij uw langetermijninvesteringen*
8. *Op een andere manier [F]*

Rolling grid, answers in columns

1. *Niet van toepassing voor onze organisatie*
2. *Niet mee bezig, niet van plan*
3. *Niet mee bezig, wel van plan*
4. *Wel mee bezig*

Mouse-over for 'social return'

Social return is het creëren van duurzame werkgelegenheid voor mensen met een afstand tot de arbeidsmarkt.

Base: Indien A03_8 = 3 or 4

A04 [O]

U geeft aan dat uw organisatie 'op een andere manier' bezig is met duurzaamheid of dat van plan is. Kunt u aangeven op welke manier?

Base: all respondents

A05 [Drag & drop] [R]

Hoe belangrijk vindt u het dat de volgende partijen zich bezighouden met duurzaamheid?

1. *Bank*
2. *Investeerders/aandeelhouders*
3. *Leveranciers van grondstoffen, producten of diensten*
4. *Leverancier van voedingsmiddelen of cateraar*
5. *Energieleverancier*
6. *Logistieke partners*
7. *Verzekeraar*
8. *Klanten*

Columns (show option 1 on the upper side (=Zeer belangrijk), show option 2 on the lower side (= Zeer onbelangrijk, please use enough differentiation on the axis so the data is spread enough):

1. *Zeer belangrijk*
2. *Zeer onbelangrijk*

SCRIPTER: include the follow-up question (respondents are asked to place a line above which they find it 'belangrijk', and below which they find it 'onbelangrijk')

Base: all respondents

A06 [S per row]

Stel dat u een samenwerking aan wilt gaan met onderstaande partijen. Checkt u of deze partijen een duurzaam beleid voeren voordat u met ze gaat samenwerken?

Rolling grid, aspects in rows [randomize, same order as A06]

1. *Bank*
2. *Investeerders/aandeelhouders*
3. *Leveranciers van grondstoffen of producten*
4. *Leverancier van voedingsmiddelen of cateraar*
5. *Leveranciers van diensten*
6. *Energieleverancier*
7. *Logistieke partners*
8. *Verzekeraar*

9. Klanten

Rolling grid, answers in columns

1. *Ja, ik werk **alleen** samen met partijen die actief werken aan hun duurzaamheid*
2. *Ja, ik geef de **voorkeur** aan partijen die actief werken aan hun duurzaamheid, maar werk ook met partijen die dat niet doen*
3. *Ja, ik kijk hier wel naar, maar laat mijn keuze er **niet sterk door beïnvloeden***
4. *Nee, ik let hier **niet** op*

B. Rol banken - duurzaamheid

Base: all respondents

B01 [S]

*De volgende vragen gaan over uw bank. Wanneer u bij meerdere banken bankiert, beantwoordt u deze vraag dan voor uw **belangrijkste** bank voor uw zakelijke bankzaken.*

Welke bank is dat?

SCRIPTER : show list of banks and 'Anders, namelijk [O]'

Base: all respondents

B02 [O]

Welke verwachtingen heeft u van uw bank ten aanzien van duurzaamheid?

SCRIPTER: insert 10 text fields and the answer option 'Geen'

SCRIPTER: after answering this question not able to go back

Base: all respondents

B03 [M, R]

Hieronder staan een aantal activiteiten die banken kunnen ondernemen op het gebied van duurzaamheid. Welke van deze activiteiten onderneemt uw bank volgens u?

Meerdere antwoorden mogelijk

1. *Inzicht geven en informatie aanbieden op het gebied van duurzaam beleggen*
2. *Producten aanbieden op het gebied van duurzaam beleggen*

3. *Inzicht geven en informatie aanbieden op het gebied van verduurzaming van woning, kantoor of vastgoedbelegging*
4. *Producten aanbieden op het gebied van verduurzaming van woning, kantoor of vastgoedbelegging*
5. *Inzicht geven en informatie aanbieden op het gebied van circulariteit (efficiënte omgang met natuurlijke grondstoffen)*
6. *Producten aanbieden op het gebied van circulariteit (efficiënte omgang met natuurlijke grondstoffen)*
7. *Actief beleid op handhaving van mensenrechten buiten de organisatie*
8. *Sponseren van duurzame initiatieven en ondernemingen*
9. *Anders, namelijk… [O]*
10. *Geen van bovenstaande [S, F]*
11. *Weet ik niet [S, F]*

Base: all respondents

B04 [S per row]

Hoe belangrijk vindt u het dat uw bank deze duurzame activiteiten onderneemt?

1. *Inzicht geven en informatie aanbieden op het gebied van duurzaam beleggen*
2. *Producten aanbieden op het gebied van duurzaam beleggen*
3. *Inzicht geven en informatie aanbieden op het gebied van verduurzaming van woning, kantoor of vastgoedbelegging*
4. *Producten aanbieden op het gebied van verduurzaming van woning, kantoor of vastgoedbelegging*
5. *Inzicht geven en informatie aanbieden op het gebied van circulariteit (efficiënte omgang met natuurlijke grondstoffen)*
6. *Producten aanbieden op het gebied van circulariteit (efficiënte omgang met natuurlijke grondstoffen)*
7. *Actief beleid op handhaving van mensenrechten buiten de organisatie*
8. *Sponsoren van duurzame initiatieven en ondernemingen*

Rolling grid, answers in columns

1. *Zeer onbelangrijk*
2. *Onbelangrijk*
3. *Niet belangrijk, niet onbelangrijk*
4. *Belangrijk*
5. *Zeer belangrijk*
6. *Ik weet niet wat het inhoudt*

Base: all respondents

B06 [S]

Hoe beoordeelt u uw bank op het gebied van duurzaamheid ten opzichte van de andere banken?

1. *Heeft te weinig aandacht voor duurzaamheid*
2. *Heeft voldoende aandacht voor duurzaamheid*
3. *Heeft te veel aandacht voor duurzaamheid*

C. Circulariteit

Base: all respondents

C01 [S]

In hoeverre was u voor het invullen van deze vragenlijst bekend met de term 'circulariteit'?

1. *Kende ik niet*
2. *Van gehoord, maar wist er weinig van*
3. *Goed van op de hoogte*

SCRIPTER: after answering this question not able to go back

Base: all respondents

Een circulaire economie kenmerkt zich door het hergebruik van producten. Door producten anders te ontwerpen, worden minder grondstoffen gebruikt en kunnen producten beter worden gerecycled. Bedrijven werken op deze manier mee aan afvalbesparing en realiseren zo materiaal- en kostenbesparingen. Er wordt betaald voor het gebruik van goederen, bijvoorbeeld voor zituren van kantoorstoelen in plaats van het kopen van kantoorstoelen, of het betalen voor verlichting in plaats van het kopen van led-lampen.

Base: if C01 = 2 | 3

C02 [S]

Hoe staat u in het algemeen tegenover investering in circulariteit binnen uw organisatie?

1. *Zeer negatief*
2. *Negatief*
3. *Neutraal (niet positief, niet negatief)*
4. *Positief*

5. *Zeer positief*

Base: all respondents

C03 [M, R]

Werkt uw organisatie volgens één of meer van onderstaande principes van circulariteit? Zo ja, welke?

Meerdere antwoorden mogelijk

1. *Hergebruikte grondstoffen in producten en diensten*
2. *Waardeterugwinning van gebruikte producten en/of bijproducten*
3. *Verlenging van de levensduur van producten door te repareren, upgraden en/of herverkopen*
4. *Deelplatformen die ervoor zorgen dat producten optimaal benut worden door gezamenlijk gebruik*
5. *Leasen van producten*
6. *Geen van deze [F, S]*

Base: all respondents

C04 [M]

Is uw organisatie actief bezig met de reductie van … ?

Meerdere antwoorden mogelijk

1. *CO2-uitstoot*
2. *Afvalproductie*
3. *Materiaalverbruik*
4. *Energieverbruik*
5. *Waterverbruik*
6. *Geen van deze zaken [S, F]*

D. ABN AMRO – circulariteit en missie 2030

Base: all respondents

D01 [S]

ABN AMRO is actief op het gebied van circulariteit. Concrete doelstellingen voor 2020 zijn:

- *100 circulaire deals*
- *Met een totale waarde van 1 miljard euro*
- *1 megaton CO2 reductie door middel van deze deals*

In hoeverre was u bekend dat ABN AMRO actief beleid voert op het gebied van circulariteit?

1. *Wist ik niet*
2. *Van gehoord, maar ik wist er weinig van*
3. *Daar was ik goed van op de hoogte*

Base: all respondents

D02 [S]

Hoe staat u er tegenover dat ABN AMRO zich hiermee bezighoudt?

1. *Zeer negatief*
2. *Negatief*
3. *Neutraal (niet positief, niet negatief)*
4. *Positief*
5. *Zeer positief*

Base: all respondents

D03 [S]

In hoeverre bent u het eens met onderstaande uitspraken over de doelstellingen van ABN AMRO rondom circulariteit?

Mouse-over for 'doelstellingen van ABN AMRO rondom circulariteit':

ABN AMRO is actief op het gebied van circulariteit. Concrete doelstellingen voor 2020 zijn:

- *100 circulaire deals*
- *Met een totale waarde van 1 miljard euro*
- *1 megaton CO2 reductie door middel van deze deals*

Rolling grid, aspects in rows

1. *Geloofwaardig dat ABN AMRO zich hiermee bezig houdt*
2. *Hebben een serieuze impact op het milieu*
3. *Onderscheidend van andere banken*
4. *Past goed bij ABN AMRO*
5. *Zou ik zelf aan willen deelnemen door meer te doen op het gebied van circulariteit*

Rolling grid, answers in columns

1. *Zeer oneens*

2. *Oneens*
3. *Niet eens, niet oneens*
4. *Eens*
5. *Zeer eens*

Base: all respondents

We stoten met z'n allen te veel CO2 uit. Die enorme CO2-uitstoot draagt bij aan de opwarming van de aarde. Om de opwarming te beperken, moeten we die CO2-uitstoot drastisch verminderen.

40% van de totale CO2-uitstoot in Nederland is afkomstig van gebouwde omgeving. 2/3 van alle leningen die ABN AMRO verstrekt zitten in huizen of gebouwen. Als ABN AMRO al deze gebouwen samen met haar klanten gaat verduurzamen, reduceert de CO2- uitstoot. Daarom heeft ABN AMRO onderstaande doelstelling geformuleerd:

In 2030 scoren alle woningen en kantoren die wij financieren gemiddeld een energielabel A.

ABN AMRO draagt ook zelf een steentje bij. Zij zorgen dat in 2023 al het vastgoed dat ze in eigen gebruik hebben energielabel A scoort. Dit geldt voor zowel de eigen panden als de panden die we huren.

Base: all respondents

D05 [S]

In hoeverre was u bekend dat ABN AMRO hiermee bezig is?

1. *Wist ik niet*
2. *Van gehoord, maar ik wist er weinig van*
3. *Daar was ik goed van op de hoogte*

Base: all respondents

D06 [S]

Hoe staat u er tegenover dat ABN AMRO zich hiermee bezighoudt?

1. *Zeer negatief*
2. *Negatief*
3. *Neutraal (niet positief, niet negatief)*
4. *Positief*

5. *Zeer positief*

Base: all respondents

D07 [S]

In hoeverre bent u het eens met onderstaande uitspraken over missie 2030 van ABN AMRO?

Mouse-over for 'missie 2030 van ABN AMRO':

We stoten met z'n allen te veel CO2 uit. Die enorme CO2-uitstoot draagt bij aan de opwarming van de aarde. Om de opwarming te beperken, moeten we die CO2-uitstoot drastisch verminderen.

40% van de totale CO2-uitstoot in Nederland is afkomstig van gebouwde omgeving. 2/3 van alle leningen die ABN AMRO verstrekt zitten in huizen of gebouwen. Als ABN AMRO al deze gebouwen samen met haar klanten gaat verduurzamen, reduceert de CO2- uitstoot. Daarom heeft ABN AMRO onderstaande doelstelling geformuleerd:

In 2030 scoren alle woningen en kantoren die wij financieren gemiddeld een energielabel A.

ABN AMRO draagt ook zelf een steentje bij. Zij zorgen dat in 2023 al het vastgoed dat ze in eigen gebruik hebben energielabel A scoort. Dit geldt voor zowel de eigen panden als de panden die we huren.

Rolling grid, aspects in rows

1. *Geloofwaardig dat ABN AMRO zich hiermee bezig houdt*
2. *Heeft een serieuze impact op het milieu*
3. *Onderscheidend van andere banken*
4. *Past goed bij ABN AMRO*
5. *Zou ik zelf aan willen deelnemen door te streven naar een zo goed mogelijk energielabel*

Rolling grid, answers in columns

1. *Zeer oneens*
2. *Oneens*
3. *Niet eens, niet oneens*
4. *Eens*
5. *Zeer eens*

E. Investeren

Base: all respondents

E01 [O]

De opbrengst van een investering kan onzeker zijn. Een investering brengt altijd financiële risico's met zich mee. Stel dat u € 100.000 kunt investeren. U heeft 50% kans om uw investering te verliezen en 50% kans om uw investering terug te verdienen en eventueel winst te maken.

*Hoe hoog moet de mogelijke opbrengst **minimaal** zijn voordat u bereid bent om deze € 100.000 te investeren?*

1. *€ 100.000 (u verdient uw investering terug)*
2. *€ 150.000 (u verdient uw investering terug en maakt € 50.000 winst)*
3. *€ 200.000 (u verdient uw investering terug en maakt € 100.000 winst)*
4. *€ 250.000 (u verdient uw investering terug en maakt € 150.000 winst)*
5. *€ 300.000 (u verdient uw investering terug en maakt € 200.000 winst)*
6. *Meer dan € 300.000 (u verdient uw investering terug en maakt meer dan € 200.000 winst)*

Base: all respondents

E02 [S per row]

In hoeverre zijn onderstaande uitspraken op u van toepassing?

Rolling grid, statements in rows (randomize)

1. *Ik wil (meer) investeren in de duurzaamheid/circulariteit van mijn organisatie, maar heb er onvoldoende middelen (geld, personeel, etc.) voor.*
2. *Ik wil (meer) investeren in de duurzaamheid/circulariteit van mijn organisatie, maar heb er onvoldoende mogelijkheden (tijd, kennis, etc.)*
3. *Ik ervaar druk van anderen binnen mijn organisatie om te investeren in duurzaamheid/circulariteit*
4. *Ik ervaar druk van anderen buiten mijn organisatie om te investeren in duurzaamheid/circulariteit*
5. *Ik investeer in duurzaamheid/circulariteit omdat ik dat zelf wil, niet omdat anderen dat van mij verwachten <show if A02 = 1, 2 or 3>*
6. *Ik investeer in duurzaamheid/circulariteit om op de lange termijn kosten te kunnen besparen <show if A02 = 1, 2 or 3>*
7. *Ik investeer niet in duurzaamheid/circulariteit omdat dit op de korte termijn te veel kosten met zich mee brengt <show if A02 = 4>*
8. *Ik investeer in duurzaamheid/circulariteit om de wereld beter achter te laten voor de volgende generatie <show if A02 = 1, 2 or 3>*

9. *Ik investeer in duurzaamheid/circulariteit om de positie van mijn organisatie in de markt te verbeteren <show if A02 = 1, 2 or 3>*

Rolling grid, answers in columns

1. *Niet van toepassing*
2. *Meer niet dan wel van toepassing*
3. *Meer wel dan niet van toepassing*
4. *Van toepassing*

Achtergrondkenmerken

Base: all respondents

F01 [S]

Wat omschrijft uw organisatie het best?

1. *Aanbieder van producten*
2. *Aanbieder van diensten*
3. *Geen van bovenstaande*

Background variables to be merged afterwards

- *Sociodemo's (leeftijd, geslacht, opleiding, regio)*
- *Wel/geen kinderen*
- *Omvang bedrijf*
- *Sector werkzaam*
- *Wel/geen klant ABN AMRO*