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The Impact of Leader Personality on Inclination to Adapt the Business Model

Decision-making in environments of perceived threat and perceived opportunity.

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Statutory Declaration

I declare that I have developed and written the enclosed master thesis completely by myself, and have not used sources or means without declaration in the text. Any thoughts from others or literary quotations are clearly marked. This master thesis was not used in the same or in a similar version to achieve an academic grading or is being published anywhere else.

Preface

This master thesis is one of a series of papers and reports published by the Center for Service Innovation (CSI). Centre for Service Innovation (CSI) is a coordinated effort by NHH to focus on the innovation challenges facing the service sector and involves 15 business and academic partners. It aims to increase the quality, efficiency and commercial success of service innovations and to enhance the innovation capabilities of its business and academic partners. CSI is funded through a significant eight year grant from the Research Council of Norway and has recently obtained status as a Centre for Research-based Innovation (SFI).

Abstract

This master thesis is an empirical research study designed to examine the possible moderating effect of personality traits on the relationship between risk domains and business model adaptation. Different theories of risk predict opposite firm and individual behaviour in domains of potential loss and domains of potential gain. It is hypothesised that one of the variables that moderate the relationship, and thereby explains how contradictory theories are supported by various studies, is individual leader personality traits. 134 Norwegian leaders participated in a survey to measure personality traits and an experiment to test for inclination to adapt the business model in different scenarios of risk. Results indicate that there is little support for most of the hypotheses predicting personality to significantly impact the way leaders make business model adaptation decisions. However, leader *Emotionality* was significantly related to low risk-taking in the domain of potential gain. As business model adaptation can be a source of sustained competitive advantage and value creation, the findings have exciting theoretical and practical implications. The findings indicate that there are meaningful applications of personality tests in theory and practice. Deliberate recruitment strategies when recruiting leaders and top management team members may help firms better facilitate business model adaptation, and result in long-term survival.

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Abbreviations

BMA	Business Model Adaptation
BM	Business Model
FFM	Five-Factor Model
CMV	Common Method Variance
TMT	Top management Team

1. Introduction

A central theme in the field of strategy is related to creating sustained competitive advantage and value creation in firms and industries (Lien, et al., 2016). The business model is increasingly considered an essential tool towards achieving this. A firm's business model is its strategy of how to create, deliver and capture value. Many also define the business model as a description of how processes and infrastructures in the firm are related. Research on business models has flourished in recent years. The concept "business model" is increasingly utilised by both researchers and practitioners. The most exciting development is the recognition that adapting, shaping and renewing the business model is paramount for firms to create value continuously. Firms that have been successful for some time risk failing if they do not alter the business model to adapt to external changes (Achtenhagen, et al., 2013; Teece, 2010; Demil & Lecocq, 2010; McGrath, 2010). This shift in the research is evidenced by a large group of studies referring to changes in the business model. An umbrella term that has been used for changes in the business model is *business model adaptation*. Business model adaptation is the process by which firms actively align their business model to a changing environment (Saebi, et al., 2016).

However, business models are often challenging to alter. Characteristics within firms can make the business model rigid and inert (Doz & Kosonen, 2010; Sosna, et al., 2010; McGrath, 2010; Achtenhagen, et al., 2013; Andries, et al., 2013). Adapting the business model is a risky venture as there is no way of knowing whether one will succeed or not. Understanding what drives firms to take risk and what drives them to adapt their business model is an intriguing and meaningful discussion related to business model adaptation. Risk-taking in firms has been a subject of significant interest for decades (Trimpop, 1994), and researchers have studied the subject thoroughly. The long-standing interest in risk-taking is evidenced by contributions from as early as the 19th century (Hawley, 1893; Haynes, 1895; Williston, 1895). Some central questions in the deep pool of research are,

among others: What motivates firms to take risks? What controls risk-taking behaviour? What situational factors influence risk-taking (Trimpop, 1994)? In this thesis, two widely used theories of risk-taking are considered: *prospect theory* and *threat-rigidity theory*. The theories are fascinating to examine opposite each other because they predict different behaviour in two domains of risk. A recent study found that Norwegian firms appeared to have acted more in line with prospect theory than with threat-rigidity theory following the financial crisis. That means they were more likely to adapt their business models in environments of perceived threat than in environments of perceived opportunity (Saebi, et al., 2016). In general, both threat-rigidity theory and prospect theory have empirical evidence to support their validity. The primary thesis hypothesis is that one of the factors that moderates the relationship between business model adaptation and risk domains, is the personality traits of leaders. Personality moderating the relationship may explain why both theories of risk-taking are supported by research.

The third central theme of this thesis is therefore personality. Measuring personality is also a subject that has interested researchers for some time. In the 1980s, methods of measuring personality boomed. Using personality tests to achieve the right recruiting decisions became increasingly popular (Johnson, et al., 1988; Stabile, 2002). Personality assessment tests were for a time considered overly simplistic and futile by researchers (Peterson, et al., 2003), but convergence was reached with the five-factor model of personality traits. A similar model, the HEXACO model, includes a sixth trait, *Honesty-Humility*. *Honesty-Humility* is significantly related to risk-taking behaviour (Weller & Thulin, 2012; Weller & Tikir, 2011).

Based on these themes and a review of existing literature, the following research question was formulated:

> *To which degree does leader personality traits influence the relationship between risk domains and leaders' inclination to adapt the firm business model?*

To find the answer to this question, surveys were conducted to test personality traits of middle managers, top managers, and CEOs. An experiment was developed to test their propensity to adapt the business model. Adapting the business model to external changes is considered crucial if firms are to create continuous value for themselves and the industry. A better understanding of how factors influence leaders' inclination to adapt the business model is therefore of high relevance. While this thesis is limited in scope and resources, the results still yield some indication of the general tendencies in the industry. These tendencies may prove valid for possible conclusions on a larger scale as well. However, the primary goal is to provide a better preliminary understanding of the relationships between the variables. Development in the fields of business models, business model adaptation, risk-taking and personality traits have provided robust models and theories. These provide a firm basis for the development of hypotheses and for establishing the appropriate methodology for hypothesis testing.

1.1 Content and structure

In the introduction, the three central themes, the research question, the purpose, and relevance of the thesis was briefly presented. A thorough literature review on personality, business model adaptation and risk-taking is then conducted. This establishes an understanding of the existing literature, theories, and recent developments in the fields. The themes are presented in general terms before details about the relevant theories and concepts and the relationships between these are discussed. Based on the literature review, the thesis hypotheses are developed. Measurement instruments, the final sample and potential challenges related to reliability, validity and common method bias are discussed in a chapter on methodology. The data is analysed using a Pearson Correlation test, repeated measures ANOVA, and regression analysis. Finally, findings, limitations, and potential for future research are discussed.

2. Theoretical Foundation and Hypothesis Development

Before collecting data and analysing these, essential terms in the problem statement and the themes of the thesis ought to be defined. To develop credible hypotheses, relationships between personality traits, risk-taking, and business model adaptation, as indicated by existing literature in the field, must be established. Potential mechanisms for how leader personality traits are connected to risk-taking are described. Relationships between the risk domains and risk-taking are examined to give further insight. The terms *business model* and *business model adaptation* are defined to establish a thorough understanding of the concepts and what they entail. There is much research on business models, personalities and risk domains individually, but there is still a lack of certainty on the actual relationship between the three. Based on a review of existing literature on the themes and their relations, thirteen hypotheses are formulated. The aim of testing the hypotheses is to understand the relationships between the themes and attempt to fill gaps revealed in the literature review.

2.1 Personality

2.1.1 Methods of Testing Personality

To understand the opportunities, limitations and development of personality testing, its history of development and relevance to practitioners and researchers ought to be discussed. Methods of measuring personality is both widely practised and broadly criticised. One of the areas where personality tests have been commonly used in practice is in recruiting. Recruiters are attracted to personality tests because the tests may help them gain insight into applicants' personalities. This is thought to help firms acquire more meaningful information about an applicant than common reference checks, and help them avoid potentially costly bad hiring decisions (Johnson, et al., 1988; Stabile, 2002).

Additionally, for many employers, it may be valuable to test for specific traits that are suitable in a specific industry, and that can therefore predict success. Factors such as these explain the widespread use of personality tests and the explosive growth in research on and development of such tests (Stabile, 2002). However, many criticise personality trait models for their lack of consistency, predictability and measurement validity (Johnson, et al., 1988; Furnham & Drakely, 2000; Stabile, 2002; Boag, 2015). Most famously, psychologist Walter Mischel chided personality tests for being unreliable. His own research found that peoples' personalities varied depending on situational factors (Mischel, 2004). The range of the types of available personality tests has also boomed, and the varieties of the tests are tremendous. Some tests contain hundreds of questions, while others are made up of much less (Framingham, 2016; Stabile, 2002). A few tests, such as the Rorschach inkblot test and the Thematic Apperception test, are projective tests, which makes them less structured in that they permit an "almost unlimited variety of possible responses" (Stabile, 2002). In an environment where there was no well-accepted taxonomy for classifying personality traits existed, it was impossible to determine whether there did in fact exist meaningful relationships between personality traits and performance criteria. Most researchers in the 60s, 70s and 80s concluded that personality traits' predictability was low (Barrick & Mount, 1991). The forms of personality assessment that are most widely used today, however, have reached more of a convergence than in earlier decades. Now, the views of many personality researchers agree regarding the structure and concepts of personality (Barrick & Mount, 1991). In recent literature on the personality, two models are generally used: the *five-factor model* and the *HEXACO model*. The five-factor model measures personality through five factors: *Extraversion*, *Neuroticism*, *Agreeableness*, *Conscientiousness*, and *Openness*. The five-factor model has emerged through the work of a considerable number of personality researchers. However, the labels and what they entail are largely based upon personality psychologist Warren Norman's research. In his 1963 article he found a consistent evidence for these five easily interpreted factors through analyses. Some researchers have reservations against the model, such as with the imprecise specification of the five

dimensions (Barrick & Mount, 1991). Others believe that decades of accumulation of literature from different disciplines and across diverse cultures (McCrae & Costa, 1996; McCrae & Costa, 1987; Leutner, et al., 2014; Giluk & Postlethwaite, 2015; Zvolensky, et al., 2015; Vigouroux, et al., 2017; Digman & Inouye, 1986) provides evidence of the robustness of the five-factor model.

The HEXACO model for personality traits is in many ways similar to the five-factor model. The "Big Five" traits, *Extraversion*, *Neuroticism*, *Agreeableness*, *Conscientiousness* and *Openness*, appear in similar form the HEXACO model as well. Two of them, *Emotionality* and *Agreeableness*, have a more complex association than their counterparts in the five-factor model. Furthermore, in the five-factor model, the trait *anger* is a marker of neuroticism, while in the HEXACO model, anger is a facet of low *Agreeableness* (Weller & Tikir, 2011). The most significant difference between the two models is, however, that the HEXACO model has an additional dimension: *Honesty-Humility*. Individuals with a low *Honesty-Humility* score are reported to feel less bound by traditional rules and restrictions and are more inclined to violate societal norms. Those with high *Honesty-Humility* are more likely to help others and less likely to cheat or steal. This trait is related to a variety of risk-taking behaviour, ranging from ethical risks to health risks (Weller & Thulin, 2012; Weller & Tikir, 2011).

The five-factor model is widely acknowledged and prevalent, and has been utilised for decades in a variety of studies ranging over different cultures and research fields. This has made it a robust way to assess personality traits for many (Peterson, et al., 2003). Using this model would also be an effective way of ensuring transferability and practical value, as it has been used numerous times before. However, the addition of a sixth dimension and more complex compositions of the other five traits in the HEXACO model offers some crucial advantages. The *Honesty-Humility* dimension has been proved to predict outcomes associated with disinhibited behaviour more accurately than the five-factor model (de Vries, et al., 2009). Findings also suggest that *Honesty-Humility* is more strongly associated with the traits in the "Dark Triad" of personality compared to the five-

factor model (Ashton, et al., 2000; Lee & Ashton, 2014). The HEXACO model explains personality phenomena that the five-factor model does not, and has been argued to better accommodate personality variables (Ashton & Lee, 2007). As the HEXACO model appears a viable alternative to the five-factor model, and in many cases yields more accurate predictions about personality and behaviour, it is the personality assessment method I have chosen to use for this thesis. The addition of the *Honesty-Humility* trait means it is better equipped to predict risk-taking behaviour. The HEXACO model is therefore better suited than other personality testing methods for this specific study.

2.1.2 Personality, Decision-making, and Risk-taking

There is a considerable amount of studies addressing the significance of personality traits on behaviour and decision-making. A review of relevant literature on personality and decision-making is valuable to emphasise the relevance and usefulness of the findings of this thesis. For this purpose, previous literature using different personality tests than the HEXACO model are still significant, and this literature review will therefore include studies using the five-factor model as well. While some of the traits differ slightly between the models, the five-factor model traits' influences on decisions are still of interest, as they are mostly transferable to the HEXACO model.

The scepticism towards using personality as a predictor of performance and decision-making has been prevalent for many decades. However, most literature still points towards individuals' personalities having a real impact on the way individuals act. For example, Dewberry, et al. (2013) examined the extent to which personality explained variance in decision-making competence. Personality was found to impact decision-making styles significantly, and the traits *Neuroticism* and *Extraversion* made unique contributions. The authors concluded that research concerned with predicting individual differences in decision-making competence would benefit from a focus on personality (Dewberry, et al., 2013). Kienzler (2017) found that managers' personality traits had a

significant impact on pricing strategies. While *Conscientiousness* and *Openness* lead to a preference for value-informed pricing, *Agreeableness* was positively related to a preference for competition-informed pricing and cost-informed pricing. Nadkarni, et al. (2010) argue that CEO *Extraversion* and *Openness* were essential to avoid the status quo in decision-making, and to maximise firm performance. Byrne, et al. (2015) found that the five-factor model could predict who would thrive and who would choke under pressure. *Neuroticism* was found to negatively predict performance under social pressure, but not under low pressure. Furthermore, *Agreeableness* was found to predict low performance under social pressure, as well as under a combined social and time pressure. The impact of personality on decision-making and performance is therefore indisputable. More interesting to this thesis is, however, the relationship between personality and risk-taking.

Byrne, et al. (2015)'s study is one of the examples where different traits, in the example above *Neuroticism*, influences decision-making in different ways depending on the environment. That is, situational factors influences the impact of personality traits, as proposed by personality test sceptic Walter Mischel (Mischel, 2004). For risk-taking, research shows that people perceive risk differently depending on their personality traits. For example, *Emotionality* was found to be associated with higher risk perception, and *Conscientiousness* was related to less perceived benefits (Weller & Tikir, 2011). HEXACO personality traits were found to predict different risk preferences depending on whether potential gains or potential losses were presented (Weller & Thulin, 2012). This focus on perceptions of threat and perceptions of opportunity is also the theme of Saebi, et al. (2016)'s research on business model adaptation and risk. Linking personality to behaviour in environments of different levels of risk is therefore highly relevant. Ultimately, the takeaway from the literature review on personality and its impact on risk-taking is that individuals' decisions are influenced by their personality, but not exclusively. The context in which decisions are made also has an impact.

2.2 Business Model Adaptation

2.2.1 The Business Model

The business model concept is one that has evolved much in the last few decades. This is in part due to the emergence of the Internet and the adoption of e-commerce (Demil & Lecocq, 2010; Pels & Kidd, 2015). There has been an explosive increase in the number of articles written about the subject. According to Zott, et al. (2011), there are at least 1 177 papers published since 1995 in peer-reviewed academic journals where business models are addressed. There is no reason to think that interest in the subject has diminished in recent years. According to the Zott, et al. (2011), the rapid growth in the number of articles written demonstrate the importance of the business model as a relatively new unit of analysis, distinct from the product, firm, industry or network. In 2010, *Business Model Generation* by Alexander Osterwalder and Yves Pignour was published. It featured a simple framework to structure business models in a comprehensible way. The book became a best-selling global phenomenon, demonstrating the increased attention paid to business models also in the practitioner communities.

Despite this heightened popularity of the concept of business models, the term "business model" has lacked a clear and agreed-upon definition. A clear definition is important both for researchers and as the practitioner community adopts the concept. As definitions until now have been unstructured and multifaceted, some say the business model concept in some senses has evolved more as a buzzword than as an actual strategic theory (Ghezzi, 2014). Various studies have referred to business models as a *statement*, a *description*, a *representation*, a *conceptual tool or model*, a *framework* and a *set*. However, many contributors do not define the concept at all or take its meaning for granted (Zott, et al., 2011). Some common themes are, however, easy to identify. Generally, contributors define business models as seeking to explain both value creation and value capture in firms, and they often empathise a holistic approach to explain *how* firms do business instead of *what* they do (Pels & Kidd, 2015). Teece (2010) defines business models as an

explanation of how value is delivered to customers, how to entice customers into paying for value, and how firms convert these values into profits. Beattie & Smith (2013) define business models as a way of articulating how the company will convert resources and capabilities into economic value. Osterwalder & Pigneur (2010) define it simply as "the rationale of how an organisation creates, delivers and captures value".

Additionally, contributors have approached business models depending on the different levels in which they operate: Morris, et al. (2005) attempt to synthesise existing literature on business models to propose a framework toward a unified perspective on business models. Based on an analysis of key words in 30 definitions, the authors found three levels, or categories, based on their primary emphasis: *economic*, *operational* and *strategic*. They found that while the business model is at the most rudimentary level defined only in terms of the economic model of the firm, the perspective becomes progressively more comprehensive throughout the next levels. At the operational level, the focus is on internal processes and the design of infrastructure that helps the firm create value. At the strategic level, definitions of business models accentuate the "overall direction of the firm's marketing position, interactions across organisational boundaries, and growth opportunities". At this level, competitive advantage and sustainability are of concern (Morris, et al., 2005).

According to Saebi, Lien & Foss (2016), many contributors define business models in terms of the firms' "value proposition and market segments, the structure of the value chain required for realising the value proposition, the mechanisms of value capture that the firm deploy, and how these elements are linked together in an architecture". This is the definition that I will adopt. The definition contains the value creation, value capture and positioning of the firm, as well as how processes and infrastructures are designed to create value and tie strategies together. This definition corresponds partly to the operational level described by Morris, Schindehutte & Allen (2005), but mostly to the strategic level. As the sample consists of middle managers, top managers, and CEOs of

Norwegian firms with strategic influence in their workplace, a definition of business models on the strategic level is appropriate.

2.2.2 Adapting the Business Model

As business models gained popularity as a subject for research, focus in the literature shifted from examining the static business model to exploring how business models change, evolve and are innovated over time (Saebi, et al., 2016). Adaptions in the business model are also discussed in Achtenhagen, et al. (2013), where the authors affirm that "business models cannot be static". As the competitive environment changes, the business model should also adapt to achieve sustained value creation (Achtenhagen, et al., 2013). Teece (2010) examines business models and their connections to business strategy, innovation management and economic theory. The paper discusses how changes or innovations in the business model can be paramount for adapting to customer needs and continue to capture value. Demil & Lecocq (2010) divides research on the business model into a static approach and a transformational approach. In the latter version, the business model is used to address change or innovation in the firm or the business model. They establish that in the dynamic view of the business model, business models have been considered a tool to change and focus on innovation. Business models in themselves have been acknowledged as radical innovations with the potential to shake whole industries (Demil & Lecocq, 2010). These, and other contributors, refer to changes that occur in existing business models over time, often in response to external triggers. Different researchers have assigned various names for these changes. Business model *evolution* is described as "a fine tuning process involving voluntary and emergent changes in and between permanently linked core components" (Demil & Lecocq, 2010). Business model *learning* is explained as established firms modifying its business model in the face of competition from a new business model (Teece, 2010). Business model *innovation* is defined as searching for new logics of the firm and new ways of creating and capturing value for the stakeholders (Casadesus-Masanell & Zhu, 2013). Other terms used for

changes in the business model are business model *renewal*, business model *replication*, business model *erosion*, business model *lifecycle*, business model *transformation*, business model *creation*, business model *extension*, business model *revision* and business model *termination* (Cavalcante, et al., 2011; Saebi, et al., 2016). Saebi, Lien & Foss (2016) classify all these dynamics as business model *adaptation*. To establish a thorough understanding of the dynamics of business model adaptation, essential drivers of adaptation ought to be discussed. The following discussion on drivers is also useful for developing a credible measurement tool business model adaptation.

In research concerning the similar concept of business model innovation, where innovation is typically implemented by an innovative, disruptive business model, change can be driven by both internal and external forces. However, for business model adaptation, drivers are exclusively external (Saebi, et al., 2016). Some external factor that may drive business model adaptation, as cited in Saebi, et al. (2016), are external stakeholders, changes in the competitive environment and new information brought on by new technology and information. These business model adaptation drivers are discussed in closer detail below.

1) External stakeholders

Miller, et al. (2014) examined the changes in the university business model using a stakeholder perspective. They found that the business model was adapted through conflicting objectives between different stakeholder groups. The business model did not change as a process of co-creation, but rather as a "series of transitions whereby multiple stakeholders are continually shaping the university business model through strategies that are dependent upon their salience" (Miller, et al., 2014). The impact of external stakeholders on business models was also affirmed by Ferreira, et al. (2012), who examined the aerospace industry. They found that business models were changed and adapted over time to adjust to the supplier-buyer relationships. They accentuate the dynamic nature of business

models in the lifecycle between supplier and customer, and importance of reciprocal adjustment of their respective business models.

2) C*hanges in the competitive environment of the firms*

de Reuver & Bouwman (2009) examined e-business companies, an industry in which firms frequently must reinvent their business models due to new technology, market conditions and regulatory changes, to find which external drivers were the most influential in adapting the business model. They found that technology and market forces were the most crucial drivers of change, while market regulation was less influential. Moreover, Voelpel, et al. (2004) argue that changes in the business landscape has helped create new business models. They affirm that no matter how successful a business model is at a certain point, it is inevitable that it will be "imitated, diluted and commoditized" by others, and challenged by new emerging business models (Voelpel, et al., 2004).

3) N*ew opportunities brought about by new information and communication technologies*

Pateli & Giaglis (2005) constructed a contingency plan for the evolution of firm or industry business models after a new technology innovation. The model was tested on a real case study, where an industry's reference business model was adjusted under the impact of a mobile innovation. Furthermore, Sabatier, et al. (2012) examined how biotechnologies and bioinformatics brought changes to the drug industry, and identified triggers that could create disruptive business models. They suggest that as new technologies emerge in an industry, and uncertainty decreases, new business models may emerge and challenge established value chains.

Based on the above review of previously used terms for business model adaptation and what it entails, as well as the brief run-through of some external drivers of adaptation, a

definition of business model adaptation can be established. I adopt the definition of business model adaptation developed by Saebi, et al. (2016): business model adaptation is "the process by which management actively *aligns* the firm's business model to a changing environment, for example, changes in the preferences of customers, supplier bargaining power, technological changes, competition, etc.".

2.2.3 Business Model Rigidity

Many researchers are concerned with firms' difficulties in managing the business model adaption process. Findings from several contributions suggest that this inertia in business model adaptation can partly be blamed on firms' willingness to experiment; Andries, et al. (2013) find that simultaneous experimentation better facilitates long-term survival than focused commitment. Another proof of the importance of experimentation is found in Sosna, et al. (2010), where an established organisation with a business model that still contributed to profits was examined. The firm in question innovated the business model when it was likely to be undermined by changes in the environment. The authors accentuate the importance of trial-and-error learning for successful business model innovation. In like manner, McGrath (2010) affirms that experimentation is key when building and evolving better business models. She highlights the importance of encouraging leaders to question the viability of the business model and to seek out conversations with people who might challenge it. However, even if firms do conduct such experimental activities, the company's business model is not always influenced. Changes in activities do not always mean changes in the core logics of how the firm operates, creates and captures value (Cavalcante, 2014).

Furthermore, business model rigidity is related to firms' ability to develop leadership and organisational capabilities. Achtenhagen, et al. (2013) find that, in addition to an orientation towards experimenting, two other capabilities are essential to fuel sustained value creation in firms: a balanced use of resources, and coherence between leadership,

culture and employee commitment. Similarly, Doz & Kosonen (2010) argue that three core meta-capabilities can make organisations more agile: strategic sensitivity, leadership unity, and resource fluidity. The authors observe that one of the primary outcomes of strategic agility is successful business model renewal and transformation. Leadership and organisational capabilities are therefore equally as important as the willingness to experiment to business model adaptation.

A third hurdle connected to business model rigidity is path dependencies. Path dependency is a tendency to continue a past or traditional practice even if new and better alternatives are available. Firms often have "structured and interdependent operational activities and relationships within and between the firm and its external stakeholders" (Saebi, et al., 2016). While these contribute to stability and operational efficiency, it can cause business models to become inert over time. Adapting the business model is therefore not an easy task, and is considered a high-risk strategy (Pateli & Giaglis, 2005). Adapting the business model is likely to involve some level of uncertainty, as the result of the outcome is unknown. When the outcome is uncertain, and business models may become inert, leaders and firms need strong incentives to adapt the business model.

2.3 Risk-taking

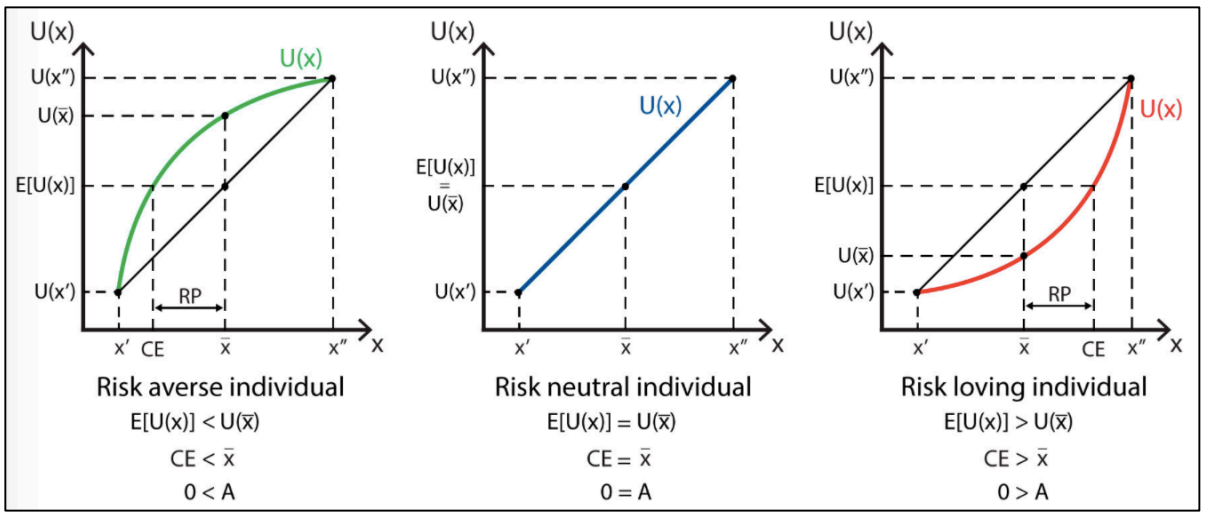
Creating a new business model is considered a high-risk strategy, and the likelihood of succeeding with it is recognised to be low (Pateli & Giaglis, 2005). Business models often are found to be rigid due to lack of willingness to experiment and poor ability to develop the right capabilities. What can prompt leaders and firms to chose the hazardous strategy of adapting their business models? Which of the two domains, potential gain or potential loss, are more persuasive to leaders in encouraging them to adapt the firm business model? To understand this, theories and empirical evidence of risk-taking, risk perception, risk propensity, and how personality factors can influence risk-taking are needed. As described in the section on personality, personality traits have been found to influence

decision-making and risk-taking by multiple contributor. Furthermore, risk perception and risk propensity are terms that are often used in research on personality and risk-taking. Risk propensity can be defined as "the tendency of a decision maker either to take or avoid risks" (Nieß & Biemann, 2014), or the decision makers' risk seeking or risk averse attitudes, which, at least intuitively, appears to at least partly be related to individual personality traits. Wang, et al. (2016) mostly found support for their hypothesis that personality and risk propensity were related. Furthermore, risk perception may in part be influenced by risk propensity, as individuals who are risk-averse may pay too much attention to the riskiness of a decision option. This may, for example, be the case for people who score high on the five-factor model's *Neuroticism* trait, or on the HEXACO *Emotionality* trait, as it has been found that *Neurotic/Emotional* people perceive risk to be higher than average (Fyhri & Backer-Grøndahl, 2012). Also, the *Agreeableness trait* has been found to correlate with a higher perception of risk than usual (Wang, et al., 2016). To establish a more structured understanding of how and when individuals and firms take risks, influential theories of risk-taking are discussed.

2.3.1 Theories of Risk-taking

One theory of risk-taking that has been dominant in the field is *expected utility theory*. According to this theory, people's risk attitude describes the shape of her or his utility function (Weber, et al., 2002). In Figure 1 below, utility functions are demonstrated with the utility on the y-axis and something of value on the x-axis, such as wealth or income. Risk averse individuals are less willing to take risk and have a concave utility function. They will gain less utility from an option with a potential value of x, than from an option of a certain value of x. Contrastingly, risk seeking individuals may gain utility when selecting an uncertain option, even if the expected value is lower.

Figure 1: Utility function, risk preferences (Policonomics, 2012)



While this theory of risk-taking is widely known and utilised, it is also criticised by many (Tversky & Kahneman, 1974; Kahneman & Tversky, 1979). Consequently, over the years, multiple theories of risk have surfaced. *Protection Motivation Theory*, in which it is theorised that people are more likely to protect themselves when they expect bad outcomes (Becker & Maiman, 1975); *Risk Compensation / Risk Homeostasis Theory*, which claims that people take more risk when they feel a sense of security (Wilde, 1994); *Situated Rationality Theory*, which argues that risky behaviour is not less rational than safe behaviours, and *Social Action Theory*, which claims that people take risks due to social pressures (Inouye, 2014). Perspectives on risk-taking have also been divided into *Risk as feelings, Risk as analysis* and *Risk as politics* (Slovic, et al., 2004). These are a few of a deep pool of risk-taking theories, but the two theories which will be considered in depth in this thesis is *threat-rigidity theory* and *prospect theory*. These are often used in research to predict firms' behaviour to external stimuli, and represent the current main streams of risk-taking behaviour adopted by researchers in the field of organisational behaviour (Tsai & Luan, 2016). The theories are also especially attractive to examine opposite each other, as they predict contradictory behaviour of firms and individuals faced with perceived threats and perceived opportunities in their environments (Saebi, et al., 2016). It is also the theories utilised by Saebi, et al. (2016), and using the same theories

in this thesis helps ensure that the findings have a sufficient level of transferability to future research.

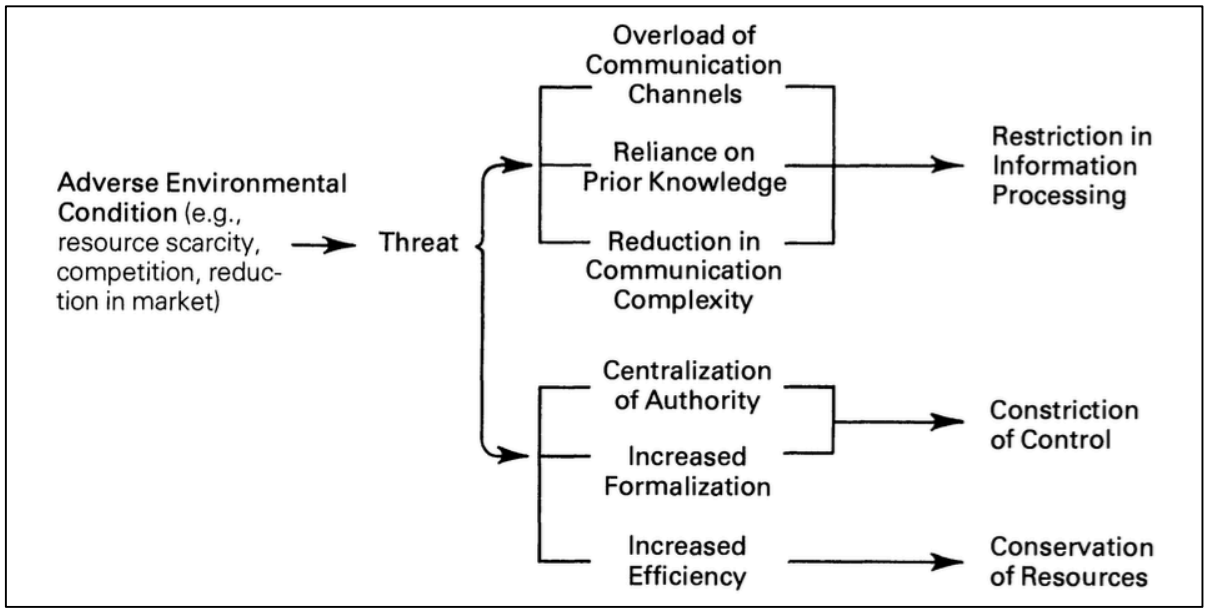
Saebi, et al. (2016) found that after the financial crisis, firms acted more in accordance with prospect theory than with threat-rigidity theory. They considered results from a survey about the effects of the financial crisis in Norwegian firms and found that the more severe the external threat, the more likely firms were to adapt their business models. Simultaneously, perceptions of opportunity in the environment were significantly related to firms maintaining the status of their business models. This behaviour is in line with prospect theory, in which external threats drive businesses to act in riskier ways. The authors did not, however, find support for the threat-rigidity hypothesis, in which a perceived threat in the environment should prompt firms to uphold the status quo. Saebi, et al. (2016) does theorise that the reason threat-rigidity theory did not predict the behaviour of the firms might be because of cultural determinants, as their study focused on Scandinavian firms only. Another reason may be that the study did not have high scores on the perceived opportunity side in their data. Although prospect theory more accurately foresaw reactions to perceived threats, threat-rigidity theory might still be correct on the opportunity side (Saebi, et al., 2016). As other contributors have found support for both theories (Tsai & Luan, 2016), and because there may be other factors that influence the relationships, it is essential to consider the two theories of risk-taking, prospect theory and threat-rigidity theory, and how these can predict risk-taking behaviour in the two domains.

2.3.1.1 Threat-Rigidity Theory

Threat-rigidity theory suggests that firms will exhibit rigidity, or an inability to act, when faced with economic adversity. According to the theory, firms that are confronted with poor performance or threats in their environments will tend to act conservative and inward-looking and react by relying on existing routines (Shimizu, 2007). In the original article on the threat-rigidity theory, Staw, et al. (1981) hypothesised that threats might

lead organisations to, among other things, rely on prior knowledge, centralise authority and increase efficiency, which results in constricted control, conservation of recourses and a restriction on information processing (see figure 2).

Figure 2: A model of organisational response to threat (Staw, et al., 1981)



When faced with perceived opportunity, firms have the ability and motivation to act more hazardously. Researchers have found support for the validity of the threat-rigidity theory: After collecting data from executives from 117 diverse organisations, one study found that threats that led to a reduction in control lead to more internally directed actions, as predicted by threat-rigidity theory (Chattopadhyay & Huber, 2001). Furthermore, the threat-rigidity argument was found to be relevant in the context of acquisitions (Meschi & Métais, 2015; Mcmanus & Sharfman, 2017). Tsai & Luan (2016) also found support for the legitimacy of threat-rigidity hypotheses. The idea of threats causing firms to act rigidly therefore has some evidence behind it, but threat-rigidity theory's prediction for firms' reactions in environments of opportunity has less research to support it. Perceptions of opportunity are associated with higher levels of control, which should motivate firms

to “initiate actions that might otherwise be perceived as too risky” (Chattopadhyay & Huber, 2001). Firms have been found to be more likely to pay higher premiums if acquisitions were framed as opportunities (Mcmanus & Sharfman, 2017); however, Chattopadhyay & Huber (2001) did not find that opportunities in the environment had the effects predicted by the threat-rigidity theory. Nevertheless, the theory is of great interest. The evidence of the validity of the model on the threat-side makes it likely that there is some truth behind the idea that in some situations, hazardous environments can make firms more rigid than environments of opportunity. As discussed in the section on business model rigidity, reasons for inert business models could be *lack of willingness to experiment*, as well as inefficient *leadership and organisational capabilities*. Staw, et al. (1981) discuss effects of risky environments on individual, group and organisational levels, and these partly correlate with the business model rigidity argument. For example, on the individual level, psychological stress, which may be caused by threatening situations, was found to make people less flexible when solving problems (Cowen, 1952a; Cowen, 1952b). Lack of flexibility may make firms less willing to experiment with the business model, and therefore lead to business model rigidity. Related to leadership and organisational capabilities are groups and organisations’ tendency to centralise power, decrease cohesiveness and descend into dissension, and it may lead to more group uniformity (Worchel, et al., 1977; Staw, et al., 1981). The threat-rigidity argument constitutes a robust theory with empirical and theoretical evidence to support it, although the results are somewhat equivocal. Even though there is more proof of the validity of the model on the potential loss-side than on the potential gain-side, the theory is still fascinating and relevant to consider for the themes of this thesis.

2.3.1.2 Prospect Theory

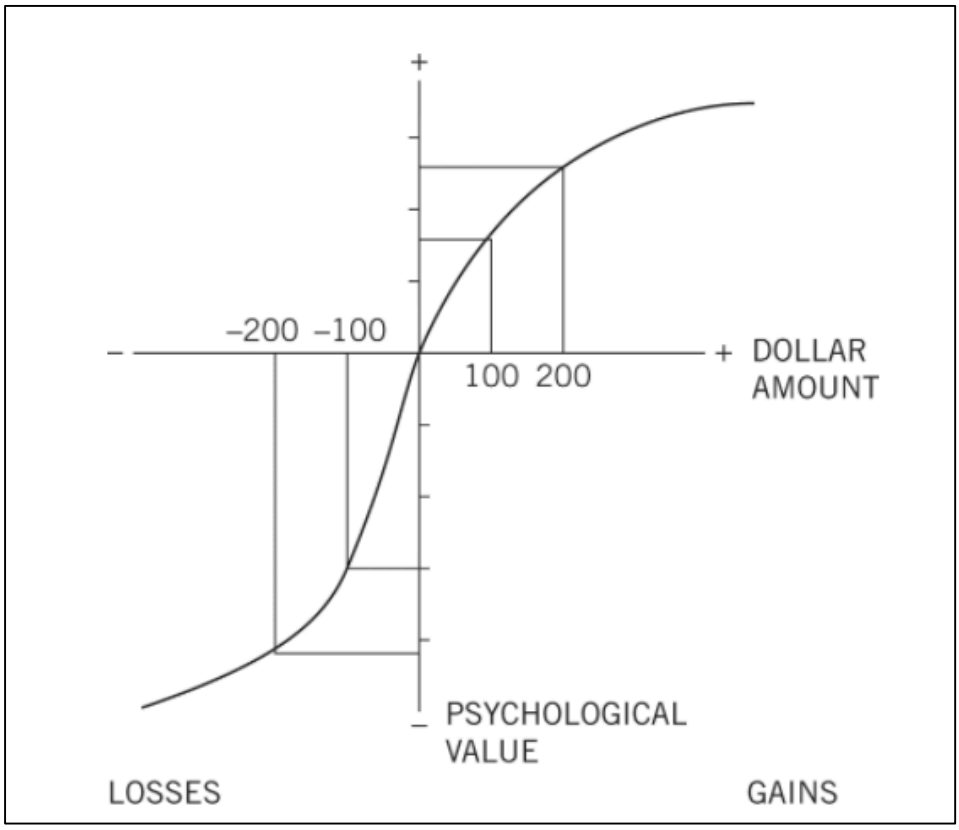
Prospect theory predicts that rather than act riskier in environments of perceived opportunity, firms and individuals will act riskier when faced with potential loss (Kahneman & Tversky, 1979). Prospect theory addresses the relationship between risk attitude and the current position of a firm (Tsai & Luan, 2016) so that all evaluations are

made relative to where the firm finds itself at any moment. Kahneman (2012) describes this as placing one hand in a bowl of hot water and one in a bowl of cold water for one minute and then placing them both in room-temperature water. One hand will feel cold, and another warm, even though the water is the same temperature. Comparably, a value is not assigned to final assets, but rather to losses and gains from one's point of reference. The theory is also based on a principle of diminishing sensitivity. While turning on a weak light in a dark room has a substantial effect, turning on the same light in a brightly-lit room may be undetectable. Similarly, the subjective difference between $100 and $200 is much more significant than the difference between $900 and $1000. Thirdly, the theory is based on loss aversion. When a loss and a gain of the same objective size are weighted against each other, the loss looms larger than the gain (Kahneman, 2012). Prospect theory assumes that individuals are not rational and that people underweight outcomes that are only probable compared to outcomes that are certain ("certainty effect"). All these principles result in individuals acting risk seeking in choices involving losses and risk averse in choices involving gains. The value function, which is illustrated in Figure 3 below, is concave for gains, convex for losses, and is generally steeper for losses than for gains. A loss of $200 constitutes a more substantial psychological loss of value than a gain of $200 constitutes a psychological gain (Kahneman & Tversky, 1979; Kahneman, 2012).

Now, almost 40 years after Daniel Kahneman and Amos Tversky first proposed the theory, many view the theory as the most accurate description of how people evaluate risk, but there are relatively few well-known applications of prospect theory (Barberis, 2013). Contributors have, however, found some support for the prospect theory arguments across different disciplines and cultures (Fiegenbaum, 1990; Dham & al-Nowaihi, 2007; Kairies-Schwarz, et al., 2017). Czeck soccer bettors were for example found to be risk averse in the domains of gains and risk seeking in the domains of losses (Krcál, et al., 2016) and poorly performing hospitals were found to implement riskier strategies (Palmer, et al., 1995). While many studies examine prospect theory on the individual level, and

while this was also the original purpose of the theory, contributors have also found support for the theory on an organisational level (Tsai & Luan, 2016). The widespread acceptance of the potency of the model, as well as the empirical confirmation of the validity through many experimental studies, makes the theory a relevant and interesting one to consider. Saebi, et al. (2016) found support for prospect theory rather than threat-rigidity theory, and, coupled with the personality trait-factors, it is interesting to delve deeper into the soundness of the two theories.

Figure 3: The Value Function (Kahneman & Tversky, 1979)



2.4 Hypotheses

Business models, risk-taking, and personality appear to be progressively important both in theory and in practice. Several significant links between them have been empirically proven. However, certainty on the actual relationship between these concepts still lacks, as contributors often find conflicting results. This thesis is an attempt to fill this gap. The

general aim is to investigate the relationship between leader personality and the inclination of the firm to adapt their business models when faced with perceived threats and perceived opportunities in the environment. The overall hypothesis is that this varies depending on the personality traits of the decision influencers and decision makers in firms. With the help of the hypotheses, the connection between leader personality traits, risk-taking and propensity to adapt the business model is examined. The HEXACO model is used to assess personality. Two theories of risk-taking, i.e. prospect theory and threat-rigidity theory, will help predict the behaviour of leaders with specific personality traits. Relevant and recent literature contributions are reviewed to justify assumptions and hypotheses. For the personality traits, evidence from contributions using both the five-factor model and the HEXACO model will be used where the personality traits from the two models are comparable. Thirteen hypotheses covering the six personality traits, the two domains and general risk-taking follow.

2.4.1 Business Model Adaptation in the Two Domains

The first hypothesis covers the relationship between the two domains and business model adaptation, which was studied by Saebi, et al. (2016). They found that firms were more likely to adapt their business models in environments of potential loss than in environments of potential gain. This forms the baseline of the rest of the thesis hypotheses.

Hypothesis 1:

Leaders are more likely to propose business model adaptation in environments of perceived threat or potential loss than in environments of perceived opportunity or potential gain.

2.4.2 Extraversion

The *Extraversion* trait is characterised by assertiveness, dominance, sociability, and talkativeness (Peterson, et al., 2003). In Lee & Ashton's original book on the HEXACO model, individuals with high *Extraversion* scores are described as confident leaders of groups who enjoy social interactions and see positive qualities in themselves. Individuals with low scores consider themselves unpopular, avoid small talk, and prefer to be alone (Lee & Ashton, 2013). The trait is associated with sensation-seeking, and sensation-seeking has been found to be significantly related to risk-taking (Nicholson, et al., 2005). In fact, various studies have found correlations between risk-taking, sensation-seeking and *Extraversion* (Aluja, et al., 2003; de Vries, et al., 2009; Dahlen & White, 2006). *Extraversion* was also positively associated with an inclination to be self-employed. Additionally, the trait has been found to positively correlate with risk tolerance (Caliendo, et al., 2014). *Extraversion* has been proven to influence risk propensity, which negatively affected risk perception (Wang, et al., 2016). However, Weller & Thulin (2012) did not find significant results for correlation between the *Extraversion* trait and risk-taking when using the HEXACO-model. Additionally, Dahlen & White (2006) found that *Extraversion* only partially predicted risky driving behaviour. The importance of *Extraversion*'s effect on risk-taking can therefore still be debated to some degree. However, for this thesis, I assume the evidence of high *Extraversion* scores being related to higher risk-taking from existing research precise enough. I predict firms with leaders with high scores on *Extraversion* to act riskier and adapt the business model in domains of potential gain because of extrovert individuals' tendency towards confidence, leadership and dominance. Furthermore, I predict that they will also lean towards adapting the business model in domains of potential loss. This is due to the reduced risk perception related to *Extraversion* and the tendency towards sensation-seeking. Firms with CEOs with a high score on the *Extraversion* trait are therefore hypothesised to be prone to adapt their business models in both domains of perceived gains and perceived

loss. This is in line with threat-rigidity theory in domains of potential gain and with prospect theory in domains of potential loss.

Hypothesis 2a:

The higher the Extraversion score, the more likely is the leader to propose business model adaptation in the domain of potential gain.

Hypothesis 2b:

The higher the Extraversion score, the more likely is the leader to propose business model adaptation in the domain of potential loss.

2.4.3 Openness to Experience

Openness to Experience correlates with divergent thinking, openness to new experiences, creativity, and thoughtfulness. Individuals with high *Openness to Experience* scores often value intellectual matters (Peterson, et al., 2003). They tend to appreciate beauty in art and nature, are intellectually curious and like to hear unusual opinions. Individuals with low *Openness to Experience* scores tend to avoid creative activities and are not receptive to unconventional ideas (Lee & Ashton, 2013). The trait can be regarded as "a cognitive stimulus for risk seeking – acceptance of experimentation, tolerance of the uncertainty, change and innovation" (McCrae & Costa, 1997, as cited in Nicholson, et al., 2005). It can be considered a trait of great relevance when predicting risk perception and risk propensity. Peterson, et al. (2003), using the five-factor model, found support for their hypothesis that CEO *Openness* would correlate with team risk-taking and intellectual flexibility. When examining self-employed people and their personalities, *Openness* was found to be positively correlated with risk-taking (Caliendo, et al., 2014) and Nicholson, et al. (2005) found that high scores on the *Openness*-trait contributed to explaining overall risk-taking. Leaders with high *Openness to Experience* scores may also be expected to adapt their business models more successfully. This is due to the trait being related to

flexibility, divergent thinking and experimentation. As discussed above, willingness to experiment and flexibility are important to avoid business model rigidity. Innovativeness and flexibility better equip firms to adapt their business models to "emerging threats and opportunities in the external environment" (Saebi, et al., 2016). It is interesting to know whether the flexibility associated with leaders' *Openness to Experience* scores will in fact manifest itself in their propensity to adapt the business model. The evidence from previous research points to individuals with high *Openness to Experience* scores acting more risk-taking in both domains. Their tendency to be curious, experimental and tolerant towards uncertainty make them more likely to exhibit risky behaviour, regardless of expected outcome. I hypothesise that firms with leaders with high *Openness to Experience* scores will adapt their business models both when faced with potential losses and potential gains in their environments. Adapting the business model in environments of threat is in line with prospect theory. Adapting it in environments of opportunity is in line with threat-rigidity theory.

Hypothesis 3a:

The higher the Openness to Experience score, the more likely is the leader to propose business model adaptation in the domain of potential gain.

Hypothesis 3b:

The higher the Openness to Experience score, the more likely is the leader to propose business model adaptation in the domain of potential loss.

2.4.4 Agreeableness

The *Agreeableness* trait represents the degree to which a person shows warmth, trust, a preference for cooperation over competition, and acceptance of others (Peterson, et al., 2003). People with high *Agreeableness* scores are described as having a forgiving nature and as being flexible and altruistic. *Agreeable* people have also been found to be more

prone to exit self-employment when needed (Caliendo, et al., 2014). The most critical difference compared to the corresponding trait in the five-factor model is that in the HEXACO model, the trait *anger* appears in the *Agreeableness* dimension, not the *Neuroticism*-dimension (Weller & Tikir, 2011). Lee & Ashton (2013) describe individuals with a high *Agreeableness* score as not prone to holding grudges, as accommodating, patient and even-tempered. Individuals with low scores on *Agreeableness* find it hard to forgive, to be critical of others' shortcomings and to stubbornly defend their point of view (Lee & Ashton, 2013). Nicholson, et al. (2005) found support for their hypothesis that risk-taking would be associated with low scores on the *Agreeableness* trait. Conflictingly, a 2015 study on personality in bettors found that high *Agreeableness* was related to high risk-tolerance. *Agreeable* bettors also exhibited herding tendencies and a wish to blend in groups (Lin & Lu, 2015). A 2016 study found that individuals with high scores on the *Agreeableness* trait tended to perceive higher levels of risk than usual (Wang, et al., 2016), and the *Agreeableness* trait has also been found to reduce entrepreneurial intentions (Ettis & Kefi, 2016). The existing literature is therefore sometimes conflicting when it comes to the *Agreeableness* trait and risk. However, there seems to be support for assumptions that individuals with high scores on *Agreeableness* will be more flexible, but that they will perceive risks to be higher than most. Furthermore, one may assume that *Agreeableness* is related to low risk propensity, as *Agreeableness* is negatively associated with impulsiveness and aggression. Impulsiveness and aggression are traits that correlate with risk propensity (Wang, et al., 2016). Flexibility may help counter the effect predicted by threat-rigidity theory when there are potential losses. It is, however, uncertain what effect high *Agreeableness* scores will have on the decision to adapt or not to adapt the business model. For the gain side, we consider the findings that reveal 1) *agreeable* individuals to perceive risks to be higher, 2) that the trait may be associated with low risk-propensity, and 3) that *Agreeable* individuals have a wish to blend in. These three points lend themselves to support expectations of a low willingness to adapt business models when faced with opportunities. The effect of high *Agreeableness* scores on risk-taking in the domain of potential loss is

unclear, and there is little relevant literature on the subjects. To examine the relationship between *Agreeableness* and risk-taking in potential loss, I hypothesise that it leads to more adaptation. The following hypotheses are proposed:

Hypothesis 4a:

The higher the Agreeableness score, the less likely is the leader to propose business model adaptation in the domain of potential gain.

Hypothesis 4b:

The higher the Agreeableness score, the more likely is the leader to propose business model adaptation in the domain of potential loss.

2.4.5 Emotionality

The *Emotionality* trait is characterised by a tendency to worry about minor matters, feeling empathetic towards others and liking to share concerns. Individuals with low scores on *Emotionality* may tend not to be deterred by physical danger or pain and have little anxiety in stressful situations. They tend to not need emotional support from others (Lee & Ashton, 2013). The trait has some similarities to the five-factor model's *Neuroticism* trait, in which high scores (i.e. highly *neurotic* people) predict a tendency to be anxious, compulsive, defensive and thin-skinned (McCrae & Costa, 1987). The trait can also be related to bad self-esteem and low self-efficacy (Judge, et al., 2002). However, *Emotionality*, like *Agreeableness*, has slightly more complex properties in the HEXACO model than its corresponding dimension in the five-factor model. Individual differences associated with sentimentalities, such as experiences of anxiety, sentimentality and empathy versus fearlessness, detachment, and independence is assigned to the *Emotionality* trait in the HEXACO model (Weller & Tikir, 2011; de Vries, et al., 2009). While the corresponding trait in the five-factor model is slightly different, the findings from research on both personality assessment methods and their relationship with risk-

taking, suggest that we can expect the same effects between the two models. Several studies have found relationships between *Emotionality* or *Neuroticism*, risk-taking and risk-perception that indicate that *Emotional*/*Neurotic* individuals are less inclined to take risks. Individuals with a high score on *Neuroticism* were found to perceive risks to be higher, while individuals who were emotionally stable perceived risks to be lower (Fyhri & Backer-Grøndahl, 2012). Caliendo, et al. (2014), whose study was on self-employed individuals' personalities and their respective propensities to enter and exit markets, found that *Neuroticism* was negatively correlated with risk-taking. The more neurotic, the less risky the individual acted. This is in line with Weller & Thulin (2012)'s findings, where HEXACO *Emotionality* was found to be associated with less risk-taking in both the potential loss and the potential gain domains. Some contributors have, however, found conflicting results. High *Neuroticism* was found to correlate with gambling behaviour when testing university students (MacLaren, et al., 2011). *Neuroticism* was in another study found positively correlate with risk-taking in parkour (Merritt & Tharp, 2013). Furthermore, *Neuroticism* was found to have no connection to risk tolerance whatsoever when personal financial risk tolerance was measured (Wong & Carducci, 2013), although the authors did not attempt to explain the missing relationship. Furthermore, Peterson et al. (2002) tested the relationship between CEO *Neuroticism* and team-level risk aversion and failed to find a significant relation. The latter findings may not necessarily imply that individual-level risk aversion was not influenced, as Peterson et al. (2002)'s study was about CEO personality's impact on team dynamics. In general, despite the somewhat equivocal results from different studies, *Emotionality* appears to be connected to risk-aversion and a risk perception that is higher than average. I will assume that risk-averse leaders result in firm hesitation to implement changes in the domain of potential loss. Higher perception of risk may make firms with leaders with high *Emotionality* score less inclined to adapt business models when faced with opportunities as well. To sum up, I predict that firms with leaders with a high *Emotionality* score will act rigidly in both domains. This correlates with prospect theory in domains of potential gain and threat-

rigidity theory in domains of potential loss. Based on these assumptions and arguments, I propose the following hypotheses:

Hypothesis 5a:

The higher the Emotionality score, the less likely is the leader to propose business model adaptation in the domain of potential gain.

Hypothesis 5b:

The higher the Emotionality score, the less likely is the leader to propose business model adaptation in the domain of potential loss.

2.4.6 Conscientiousness

Conscientiousness refers to the degree to which a person shows responsibility, dependability, perseverance, prudence, or concern with following the rules. People with a high *Conscientiousness* score tend to be more task-focused than relationship-focused (McCrae & Costa, 1987; Judge, et al., 2002; Peterson, et al., 2003). Lee & Ashton (2013) describe individuals with high *Conscientiousness* scores as orderly with things and time and as pursuers of accuracy and perfection. They prudent and careful in their decision-making. Individuals with low *Conscientiousness* scores are disorganised with their surroundings and schedules. They tend to act without thinking of the consequences and do not mind incompleteness and inaccuracy (Lee & Ashton, 2013). Individuals with low *Conscientiousness* scores tend to be more reckless, and are more prone to engage in risky behaviours (Weller & Tikir, 2011). Examples are risky sexual behaviour (Trobst, et al., 2000), smoking (Terracciano & Costa, Jr., 2004; Hampson, et al., 2000) and substance abuse (Terracciano, et al., 2008). High *Conscientiousness* scores have also been found to moderate maltreated children's path towards risky behaviours (Carlson, et al., 2015). Substantial evidence of *Conscientiousness'* influence on risk-taking is found in a study on child- and adult mortality. The trait was measured independently in childhood and

adulthood and predicted mortality risk across the whole lifespan. Interestingly, less *conscientious* individuals were more likely to die from injuries than those with higher *Conscientiousness* scores (Martin & Friedman, 2007). The effect of the *Conscientiousness* trait on individuals' general risk-taking behaviour therefore appears unequivocal. High *Conscientiousness* leads to less risk-taking. As for the two domains, low *Conscientiousness* has been found to be associated with greater risk-taking only when faced with potential gain (Weller & Thulin, 2012). I propose the following hypotheses.

Hypothesis 6a:

The higher the Conscientiousness score, the more likely is the leader to propose business model adaptation in the domain of potential gain.

Hypothesis 6b:

The higher the Conscientiousness score, the less likely is the leader to propose business model adaptation in the domain of potential loss.

2.4.7 Honesty-Humility

The final trait, *Honesty-Humility*, exists solely in the HEXACO model but is somewhat related to the dark triad of personality traits. The dark triad consists of Machiavellianism, narcissism and primary psychopathy (Weller & Thulin, 2012). These are traits that are associated with maladaptive behaviour. Individuals with a low *Honesty-Humility* score tend to be willing to bend the rules for personal gain. They desire money and expensive possessions and feel entitled to special status and privilege. Individuals with high scores on the *Honesty-Humility* trait avoid acting false and manipulative. They are fair and law-abiding and do not consider themselves superior to others (Lee & Ashton, 2013). The HEXACO model is newer than the five-factor model, and the pool of existing research on *Honesty-Humility* and risk-taking is therefore much shallower. Some contributors have, however, found significant links already. Sensation-seeking and risk-taking were found

to be significantly related to the *Honesty-Humility* trait (de Vries, et al., 2009), and low scores on the trait predicted risky driving (Burtaverde, et al., 2017). Furthermore, Weller & Thulin (2012) found that low *Honesty-Humility* was significantly related to risk-taking both in environments of potential gain and potential loss. The hypotheses are therefore that low leader scores of *Honesty-Humility* will cause firms to adapt the business model in both domains. This is in line with threat-rigidity theory on the gain-side and prospect theory on the loss-side.

Hypothesis 7a:

The lower the Honesty-Humility score, the more likely is the leader to propose business model adaptation in the domain of potential gain.

Hypothesis 7b:

The lower the Honesty-Humility score, the more likely is the leader to propose business model adaptation in the domain of potential loss.

2.4.8 Conceptual Framework

Based on the above hypotheses, a conceptual framework can be developed. Figure 4 shows the conceptual model of the primary hypothesis. From Saebi, et al. (2016), we know that there is a relationship between the two domains and business model adaptation in firms. I hypothesise that personality has a significant moderating effect on this relationship. Personality is hypothesised to be one of the factors that can explain why there is support for both threat rigidity theory and prospect theory's validity in predicting firm behaviour. *Potential Gain* and *Potential Loss* are the independent variables, as the domains firms find themselves in cannot be influenced by the other factors in the short term. *Business Model Adaptation* is the dependent variable, as we know that the propensity to adapt the business model depends on the domain. The effect of the domains on the propensity to adapt the business model may be influenced by leader personality

traits. Therefore, the personality traits, *Extraversion*, *Openness to Experience*, *Agreeableness*, *Emotionality*, *Conscientiousness,* and *Honesty-Humility*, are moderating variables. The relations between the variables are illustrated in a simplified model and a detailed model in Figure 4 and Figure 5 respectively. As illustrated in the detailed conceptual model, *Extraversion* is hypothesised to have a negative impact on the relationship between *Potential Gain* and *Business Model Adaptation*, i.e. the trait will make individuals more likely to adapt the business model. Emotionality is hypothesised to amplify the negative relationship between Potential Gain and *Business Model Adaptation*, and so on.

Figure 4: Conceptual model simplified

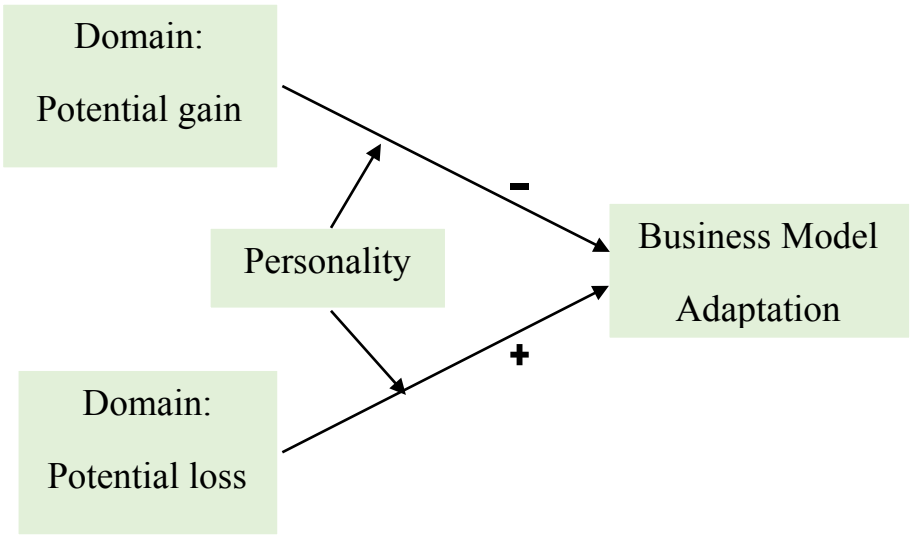
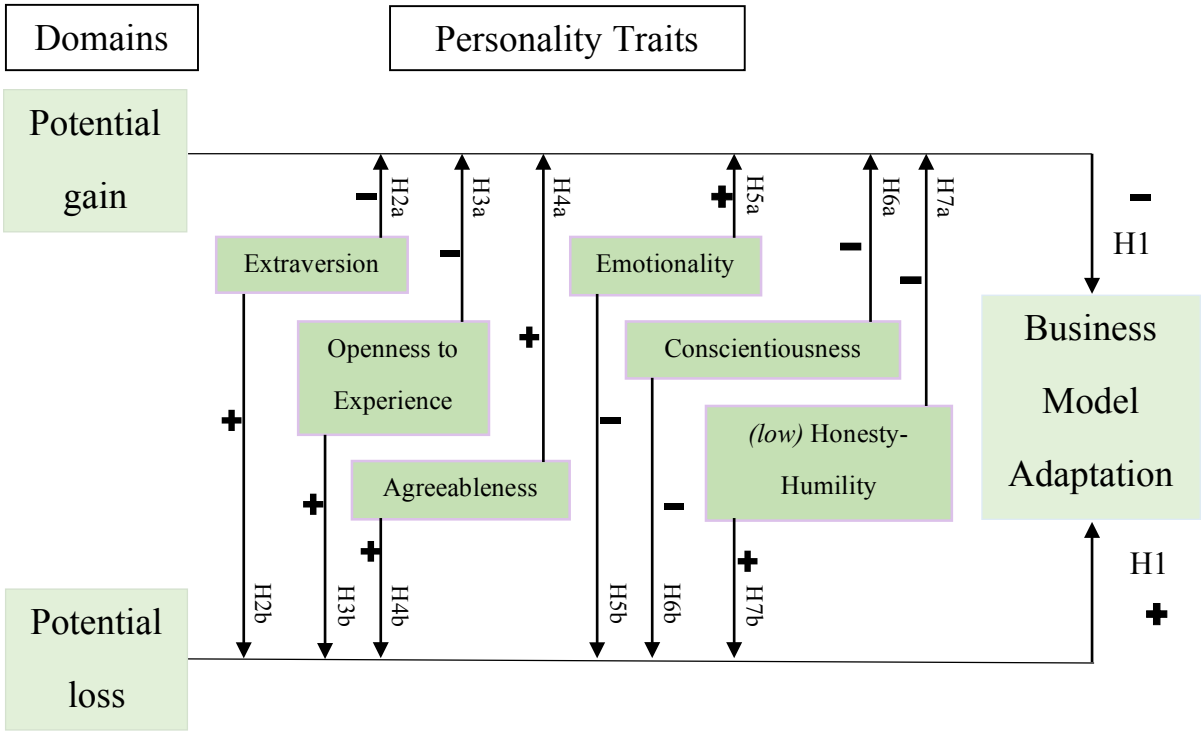


Figure 5: Conceptual model detailed



3. Methodology

Based on the literature review and the hypotheses, an appropriate research design was established and implemented. The basis for the study is a personality test which includes self-rating questions, and an experiment that was designed for this study specifically. The self-rated version of the HEXACO personality test was considered the most appropriate way to gather data on personality. Using self-rated questions evenly distributed the workload for each of the participants. It was decided that an experiment with various risk scenarios was the most accurate and unambiguous way to gather information about leaders' propensity to adapt business models in different risk domains. However, participants were asked to use real experiences as far as possible to immerse themselves in the experiment better. An alternative would be to measure this variable using a questionnaire. A questionnaire would ask participants to report what had been done in the situation rather than what they would propose to do. Because this study is attempting to find out if leader personality traits can moderate leader behaviour in different domains of risk, an experiment was deemed a more appropriate instrument for measurement. Another benefit of the experiment as opposed to a survey was that data from both domains, *Potential Loss* and *Potential Gain*, could be gathered. In Saebi, et al. (2016)'s article on business model adaptation and theories of risk-taking, a problem was lack of data on the gain side. Ensuring enough data from both domains is a way of attempting to fill the gap of missing information.

In experimental designs, the standard process is to divide participants randomly into experimental and control groups. A quasi-experimental design would be appropriate for this study, with a non-random assignment to groups based on personality traits. Personality scores would need to be collected before the experiment could be implemented. Collecting data at two different points in time was, however, deemed troublesome for this thesis. Sending out the personality trait questionnaire and the experiment at the same time ensured that there would be no sample mortality. All

participants were part of the same large group, and, therefore, the final design has a within-subjects characteristic.

3.1 Measurement Instruments

Personality traits were measured by the previously discussed HEXACO model. The questionnaire was downloaded from hexaco.org, the official website of the HEXACO personality trait test. As the participants of the sample are from Norwegian firms, and all speak Norwegian as a first language, the HEXACO test that was sent out was a Norwegian translation. The original 60-item test in English can be found in Appendix A. Some sample items are "I would be quite bored by a visit to an art gallery.", "When working on something, I don't pay much attention to small details.", and "When it comes to physical danger, I am very fearful.". The original 5-point Likert-type scale was utilised: 1: Strongly agree, 2: Agree, 3: Neutral (Neither agree nor disagree), 4: Disagree, 5: Strongly disagree (Ashton & Lee, 2009).

For the business model adaptation experiment, questions from the 2010 survey of Norwegian firms after the financial crisis were considered. The data from the survey was used in Saebi et al. (2016)'s article on business model adaptation and risk domains. The questions were adopted and adjusted to use in the experiment. As business model adaptation is still a new term, and measurement methods not yet established, it appeared appropriate to base the experiment on this survey. Participants were first asked to choose at least two relevant external changes that had been experienced or was currently being experienced by their firm. The alternative external changes were *Changes in customer preferences*, *Changes in supplier power*, *Changes in technology* and *Changes in the competitive environment*. The external changes were based on the drivers of business model adaptation presented in the theory chapter, as well as on the 2010 survey on Norwegian firms after the financial crisis (Saebi, et al., 2016). If participants chose "None of the above", they were sent to the end of the survey, as their responses were no longer

of relevance to the experiment. For each of the chosen external changes, participants were given four replicates of scenarios of risk and asked to make decisions based on the scenarios. The scenario with the least risk had a sure gain of 50 if no change was made, and an uncertain expected gain of 80 if any changes were made. The riskiest scenario had an inevitable loss of 50 if no changes were made and an uncertain expected loss of 125 if changes were made. These losses and gains were developed with theory from prospect theory in mind. The scenarios were designed to measure participants' reaction in scenarios of potential high gain, low gain, low loss and high loss. That means that there were two replicates for each of the domains, *Potential Gain* and *Potential Loss*. The experiment was designed so that the more risk the participants wanted to take, the more business model adaptation changes they could choose. Having all participants make choices in both domains ensured that sufficient data was also collected on the gain-side, which was lacking in Saebi, et al. (2016)'s study. To simplify the experiment, the number of business model adaptation options were reduced from 9 to 7. One option was to do nothing, and the remaining six were practical, general options that could be applied to the chosen external changes.

The survey also contained several control variables and descriptive variables, which the participants were assured would not be used to track individual responses. This identifying information was deleted when it was no longer needed. These variables were *Gender* (1: Male, 2: Female), *Age* (1: 24 or younger, 2: 25-34, 3: 35-44, 4: 45-54, 5: 55-64, 6: 65-74, 7: 75-84, 8: 85 or older), *Years in position* (one year increments), *Hierarchical position* (1: CEO, 2: Top manager, 3: Middle manager, 4: Department Manager, 5: Other), *sector* (1: Private, 2: Public) and *Industry*. The list of industries was collected from karrierestart.no.

After some pilot testing among fellow students and associates, the design of the experiment was improved to simplify the process for participants and increase response rate and response accuracy. Some wording was clarified, and better instructions for the experiment added. The time spent by pilot testers was the basis for the expected time to

finish the survey communicated to the individuals approached to participate in the final survey. Initially, the personality test took the pilot testers 10-12 minutes to complete, and the experiment an additional 5-8 minutes. The whole process took 17-20 minutes. The median of the time it took the 94 individuals in the sample to finish the survey and experiment was 19,23 minutes.

3.2 Sample and Data Collection

The questionnaire and experiment were distributed to 385 middle-managers, top managers and CEOs in Norwegian firms in various sectors. To secure enough respondents, managers at different management levels were contacted. The study is focused on leaders because this gives a more realistic image of how leaders would behave in the risk scenarios. Furthermore, the scenarios presented were designed to correspond to situations leaders are already familiar with. Leaders with strategic influence in their firm were of relevance to the study. Because leaders even on a middle manager/department manager level are proven to have strategic influence (Hope, 2015), leaders on the levels of CEO, top manager, middle manager and department manager were asked to participate. Some of the firms were chosen through collaboration with Centre for Service Innovation (CSI) at NHH. The association with CSI may have had a positive influence on the response rate. Many of the contacted firms were also chosen because of a personal or professional connection between the firms and myself or between the firms and associates. Many were also contacted via email or phone call, where the themes and aims of the project were described. Data was mostly gathered from firms in the private sector. Public-sector organisations may not experience risk in the same way, and the need and ability to take risk may be more comparable among companies that operate in the private sector. All participants were then sent a short description of the project, survey and experiment. Participants were assured that identifying data could not be used to track individual responses and that identifying information would be deleted when it was no longer needed. When the participants received the anonymous link to the survey and experiment, they

were informed that they would have around two weeks to complete it. As more participants responded to the initial invitation to participate during the data collection period, the deadline for participation was extended by a week. All participants received a reminder a week after they were first sent the link. Two days before the final deadline, all potential participants were sent a final reminder. 134 individuals ended up participating in the survey and experiment, which equals a response rate of 35%. Participants were offered their personality profiles sent to them after participating, and all respondents could choose to participate in a prize draw where five respondents won a universal gift card worth NOK 1500. These measures may have contributed to increasing the response rate (Saunders, et al., 2015). Out of the 134 responses, 29 had to be deleted because they were blank or unfinished. Another five had to be removed because the participant was irrelevant to the study due to lack of experience with external changes or because they did not have a position in the firm which was of relevance. Out of the 134 responses, there was a 78% completion rate. After screening for outliers before the analysis, six outlying responses were also removed.

This left 94 relevant responses. Out of these, 26% were women and 74% were men. A significant surplus, 46%, were in the age bracket 45-54, and most others were in the age groups 35-44 (21%) and 55-64 (23%). Almost all the responses, 94%, were from individuals in the private sector. Information about nationalities was not collected, but all the respondents spoke Norwegian and worked in Norwegian firms, so it is realistic to assume that most of the respondents had Norwegian origins. This ensured that cultural effects could not account for variance among the sample. However, there may be a risk that the results are not transferable internationally if the behaviour recorded rests upon a Norwegian cultural phenomenon. 28% of the sample were CEOs, 21% top managers, 24% middle managers and 16% department managers. The remaining 11% chose the option "Other" and reported positions such as Specialist, Partner, Project Manager, Chairman of the Board and Sales Manager. There are a couple of notable aspects of the sample. Firstly, male respondents in the age bracket 45-54 account for over 34% of the total sample.

Secondly, a far more significant percentage of the responding men were CEOs than the corresponding percentage for women. Sample characteristics will be addressed in the next section of the thesis.

Figure 6: Sample age

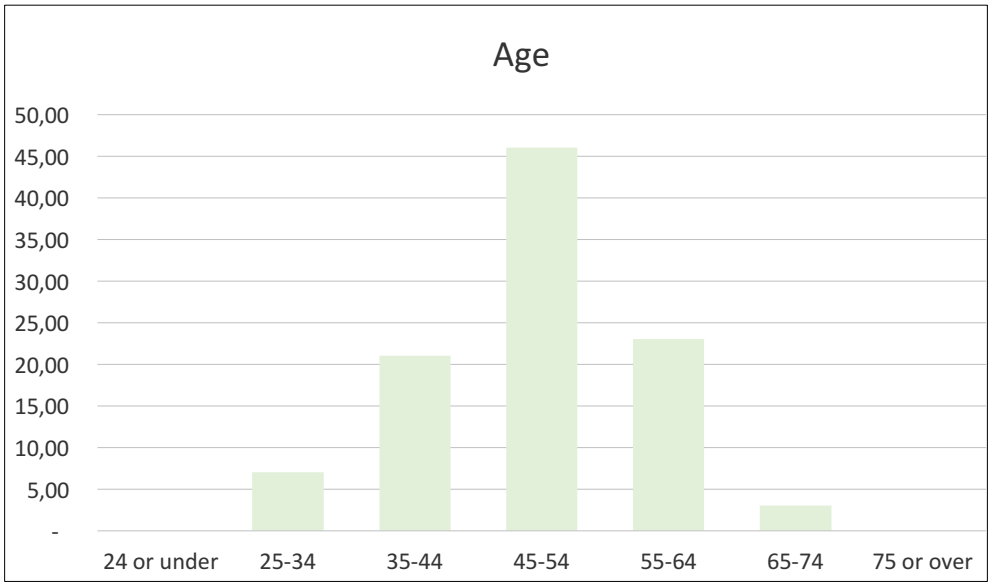


Figure 7: Sample age by gender

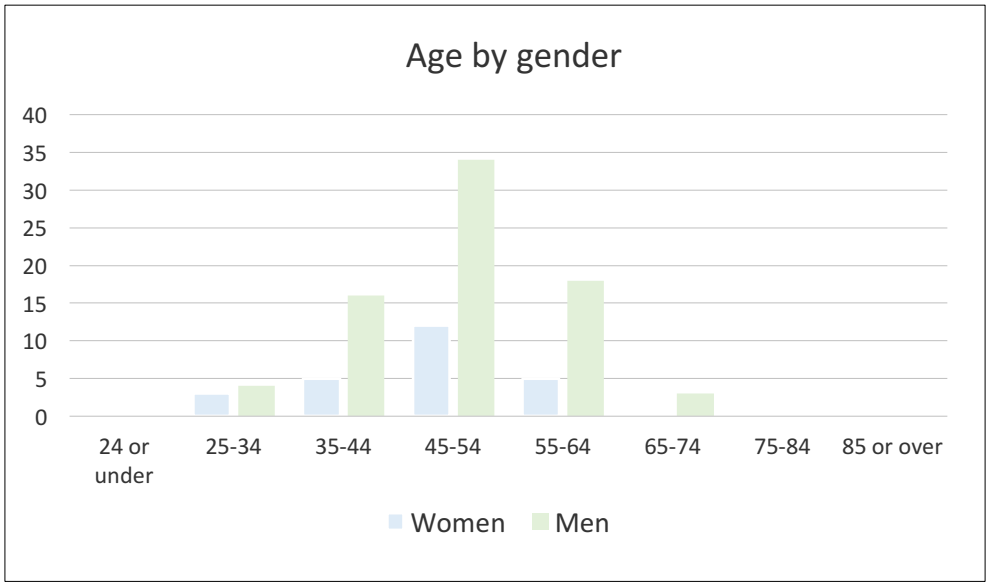
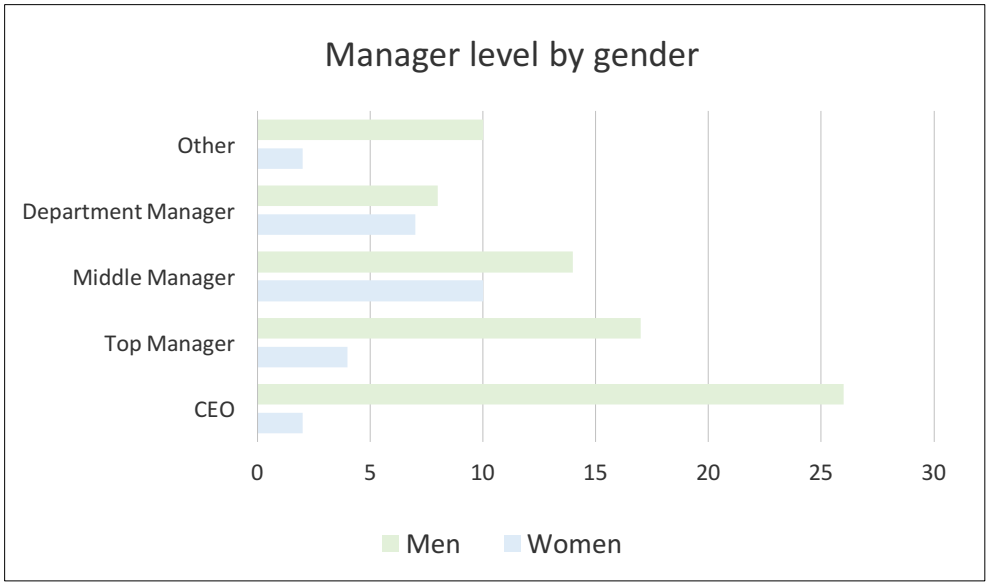


Figure 8: Sample manager level by gender



3.3 Validity and Reliability

The purpose of any study is to explain the world around us, try to understand how it works, and, generally, increase our knowledge (Saunders, et al., 2015). As such, to contribute with valuable knowledge, the research conducted needs to be credible and dependable, or valid and reliable. The validity and reliability of the methodology employed must therefore be addressed as part of the research design, and to aid in the interpretation of results. The question that needs to be considered is, "Will the evidence and my conclusions stand up to the closest scrutiny?" (Raimond, 1993, as cited in Saunders, et al., 2015).

Firstly, reliability, or the extent to which the research could be repeated by other researchers and yield the same results, must be evaluated. This is essential to make sure one is generating results that are beneficial also for future research. Internal reliability refers to ensuring consistency during a research project. External validity refers to whether the data collection method and analytical procedures produce consistent findings if they were to be repeated on another occasion. For the HEXACO personality trait test, it can be argued that there is test-retest reliability because the test has been utilised across various disciplines and cultures for years. The experiment, however, was designed for this project specifically. It therefore does not have more test-retest reliability than the fact that it was based on the 2010 survey questions directed towards Norwegian firms after the financial crisis. These data were used by Saebi, et al. (2016) when measuring business model adaptation. Furthermore, the experiment is based on theory from other research on business models and business model adaptation. These aspects make the experiment a more reliable measure. Potential participant error and participant bias was also addressed. The pilot testing of the experiment lead to adjustments to improve design and wording. No experiment links or reminders were sent out on sensitive times such as Fridays or during the weekend. This and can be assumed to have reduced the threat of participant error or participant bias, which are threats to the internal consistency. Furthermore,

Cronbach's alpha was calculated and resulted in a value of $\alpha = 0.658$. This translates to moderate internal consistency (Christophersen, 2006). Reliability therefore appears sufficiently covered considering the circumstances.

Reliability is one of the critical aspects to consider when assessing the research quality, but equally important is the validity. Research validity is the extent to which the study measures what it is supposed to measure. For the HEXACO personality traits test, the internal validity of the method, such as construct validity, content validity, and predictive validity, has been established through the empirical analyses and literature reviews in the development process. As the measures were applied unaltered from the original test, they can be assumed to have robust internal and external validity. Regarding the experiment, construct validity ought to be discussed. Construct validity is the extent to which the measurement questions measure the constructs they are intended to measure (Saunders, et al., 2015). Does the experiment truly measure leaders' propensity to prefer business model adaptation to no business model change at all when faced with scenarios of different levels of risk? As discussed above, business model adaptation is still a relatively new term, and this way of measuring it has been designed specifically for this study. No validated measurement scale exists yet (Saebi, et al., 2016). The experiment has, however, been built on theory and research on business models and adjustments in these, as demonstrated in section 2.2 of the theory chapter. The experiment should accurately measure leaders' propensity to adapt the business model in different domains of risk. Content validity is the extent to which the measurement device adequately covers the investigative questions (Saunders, et al., 2015). Consideration of this must also be based on the available information and research on which the experiment is established. The research has been carefully planned and defined through a thorough literature review, and the construct and content validity therefore appears sufficiently fulfilled, though not without fault. It is suspected that the experiment ought to be re-worked to create a more realistic risk scenario for the participant.

Furthermore, the external validity must be addressed. External validity refers to the extent to which the findings can be generalised to other relevant settings or groups (Saunders, et al., 2015). In general, random selection of the sample and a large sample size addresses the external validity issue. In terms of the experiment, however, two validity aspects ought to be considered in detail. Firstly, the generalisability of the people who participated in the experiment to the population in general, or *population validity*. Secondly, the generalisability of the situation created in the experiment to real-life settings, or *ecological validity* (Michael, 2002). Population validity refers to how representative the sample is compared to the population, and how widely the finds apply. To ensure that the sample was representative, firms from various industries and sectors were contacted. Leaders on different management levels responded. The sample was collected irrespective of respondent age and gender, although the final sample does have a surplus of men and respondents in the age group 45-54. Furthermore, there is a significant difference in how the genders are distributed across the different management levels. A far larger percentage of the male respondents are CEOs than the women. It can be argued, however, that Norwegian leaders are predominantly men in the age group 45-54, and that the sample therefore represents the natural distribution relatively accurately. According to SSB, only 35% of leaders in the age group 20-66 in Norway were women in 2016 (Statistics Norway, 2016). Additionally, the average leader in Norway has been found to be male and 45 years old (Futsæter, 2016). The sample therefore appears to adequately represent the total population, which is Norwegian leaders on different management levels. The other aspect, ecological validity, appears less relevant to this study because of the study's causal nature. In causal studies, the most important objective is to prove that there is a causal relationship between two variables, rather than demonstrating what happens in existing conditions. The latter is usually the aim of descriptive studies (Saunders, et al., 2015). However, as the experiment questions were adapted from the 2010 survey on Norwegian firms after the financial crisis, and their answers reflected real-life adjustments to the business model as a reaction to a crisis, ecological validity still appears adequately covered.

3.4 Common Method Bias

Common method variance (CMV) is "variance that is attributable to the measurement method rather than to the constructs the measures represent" (Podsakoff, et al., 2003). Rather than the actual constructs or content creating variance, common method variance means that the method itself is biased, and could be establishing a false or lacking correlation between the variables. This is especially of concern when the same instrument is used to gather data on the independent and dependent variable at the same time, which is the case with this project. Self-report questionnaires can also increase the risk of CMV. Common method variance also ought to be considered when the data is gathered exclusively through surveys. Additionally, experimental studies may in some cases be susceptible to common method variance (Malhotra, et al., 2016). A brief discussion of ex-ante and ex-post remedies is therefore appropriate.

Ex-ante remedies are predominantly techniques for controlling bias through the design of the study's procedures (Podsakoff, et al., 2003; Chang, et al., 2010). Some measures were taken before data collection to prevent common method bias, most notably *counterbalancing question order*. For half of the participants, the personality test was displayed first, while for the other half, the business model adaptation-experiment was displayed first. Furthermore, the risk scenarios in the experiment were presented randomly, and not in order of risk. The descriptive variable questions were, however, always displayed first. This was done not to disturb the logical order of general before specific questions. Another measure that was taken was to ensure participants that their participation was anonymous. This was included in both the informational document sent out before the survey, in the invitation email, in reminder emails and the actual survey. Participants were also ensured that should they choose to provide their email address, it would be deleted following the prize draw. These procedures of ensuring anonymity ought to have reduced respondents' evaluation apprehension (Podsakoff, et al., 2003). Furthermore, terms and expressions that were deemed too unfamiliar or abstract were

removed from the questions. Only terms that were necessary and that would be meaningful to the respondents were included in the survey and experiment. Explanatory parts of the survey and experiment were reworked to be short and concise.

Ex-post remedies are ways of dealing with common method bias in the statistical analysis of the data. One of the most popular ways of testing for common method variance is Harman's test, which measures how much of the variance one variable is accountable for. Running this test on the data in SPSS returns a score of 23%, which signifies an acceptably low common method variance. Many researchers recommend statistical methods of testing for CMV that are more sophisticated (Podsakoff, et al., 2003). However, Harman's test is a sufficient indication that CMV is not of grave concern in the case of this master thesis. The issue of common method bias is considered to have been sufficiently addressed within the realms of the frame, scope, and implementation of the study.

3.5 Analysis Process

Three weeks and two days after the link to the survey and experiment was sent out to the first participants, data collection was completed. All data were imported into the software package SPSS to evaluate the data and to assess whether the hypotheses could be confirmed or rejected. First, some descriptive analysis was carried out to find the means and standard deviations of the received responses. Pearson Correlation Analysis was then carried out to find whether some significant correlations existed between the variables. To test the hypotheses, repeated measures ANOVA and regression analysis was conducted, the former to test hypothesis 1, and the latter to test the remaining twelve hypotheses. Initially, analysis of variance between groups was chosen as the method of analysis for all the hypotheses. However, data appeared sparse on the low end of the personality trait scores, as demonstrated in the next sections. Regression analysis was therefore considered a more precise method for hypothesis 2a through 7b. For these,

regression analysis was used. For hypothesis 1, concerning overall risk-taking, comparing groups was deemed an appropriate way to analyse the data.

4. Data Analysis and Findings

Some preliminary data screening was carried out before the data analysis. 29 incomplete responses were discarded of, and five responses from individuals that turned out not to be of relevance to the study were deleted. To ensure that conclusions on the correlation between variables were not affected by outliers, all data were examined for outliers using a boxplot analysis. Twelve outliers were identified, and after some examination, six of these were removed. Some outliers were the result of slightly higher or lower personality scores than average, and were not removed. These were likely not errors but accurate representations of the sample, and therefore deemed useful for the analysis. The remaining data set of 94 responses was used in full in the following analysis.

4.1 Descriptives

As a first step, descriptive analysis was undertaken on the variables to determine central tendencies. Mean values, medians, modes and standard deviations were examined, and are depicted in Table 2. For some of the personality traits measures, namely *Honesty-Humility*, *Extraversion* and *Conscientiousness*, the measures of central tendency appear quite high (M = 38,60, M = 39,28 and M = 37,82). Out of all the personality traits, *Emotionality* was the only trait with a notably lower central tendency, with M = 25,51 (SD = 4,71). Standard deviations for each of the personality traits measures are relatively similar (SD between 4,22 to 4,71), except for *Openness to Experience*, where SD = 5,92 (M = 35,06). The relatively high mean scores and low standard deviations reflect how the sample generally scored high on most of the personality traits, and that the average deviations from the mean scores are generally low across the board.

For the average number of changes per domain in each of the domains, *High Gain*, *Low Gain*, *High Loss* and *Low Loss*, the mean scores reveal higher numbers of changes chosen in the domains of *High Gain* and *Low Loss*, and significantly lower central tendencies in *High Loss* (M = 1,31). Standard deviations for each of the four variables appear quite high

considering the means of the variables. Average total changes made, regardless of domain, was 8,10, with a standard deviation of 3,36, which is also relatively high. High standard deviations can in some cases be an indication that the data is less reliable, but the assessment ought to be based on the nature of the data. In this case, data was collected from leaders with varying personalities in multiple firms and industries, and it is expected that different firms experience and react to changes differently. A low standard deviation is therefore not necessarily a central aim for this study.

Table 1: Descriptive Statistics

	N	Mean	Median	Mode	Std. Deviation	Minimum	Maximum
Honesty-Humility	94	**38,5957**	39,5000	40,00	4,35845	25,00	48,00
Emotionality	94	**25,5106**	25,0000	25,00	4,71498	14,00	36,00
Extraversion	94	**39,2766**	39,0000	39,00	4,32399	29,00	48,00
Agreeableness	94	33,5213	33,0000	33,00	4,29736	23,00	43,00
Conscientiousness	94	**37,8191**	38,0000	37,00	4,21713	25,00	46,00
Openness to Experience	94	35,0638	35,0000	33,00	**5,92391**	19,00	48,00
Total Changes	94	**8,1011**	8,0000	5,00	3,35924	2,00	18,67
Total Gain	94	4,6933	4,5000	6,00	1,76206	1,00	9,50
High Gain	94	**2,7562**	2,5000	2,00	1,08683	0,00	6,00
Low Gain	94	**1,9371**	2,0000	3,00	1,19191	0,00	4,50
Total Loss	94	3,4078	3,0000	2,00	2,15649	0,00	9,33
High Loss	94	**1,3094**	1,3333	0,00	1,26509	0,00	5,00
Low Loss	94	**2,0984**	2,0000	2,00	1,24835	0,00	6,00

4.2 Pearson Correlation Analysis

As a first step to assess the hypotheses, Pearson correlation analysis was carried out between the personality trait variables and the business model adaptation variables to reveal correlations between them. The results are illustrated in Table 2. Statistically significant correlations are highlighted and marked with asterisks.

The analysis shows a statistically significant negative correlation ($p = .026$) between *Emotionality* and *Total Gain*. *Total Gain* is average changes made per external change (changes in customer preferences, changes in supplier power, changes in technology, changes in the competitive environment) in the domain of potential gain. The correlation was strong between *Emotionality* and changes made in *High Gain* ($p = .015$), but far from statistically significant in the domain of *Low Gain* ($p = .281$). Similarly, the positive correlations between *Openness to Experience* and *Total Gain* and *Openness to Experience* and *High Gain* were statistically significant ($p = .040$ and $p = .026$ respectively), but the correlation between *Openness to Experience* and *Low Gain* was not. These correlations, indicating less of an inclination to propose business model adaptation for higher *Emotionality* and more of an inclination for higher *Openness to Experience*, build some support for hypothesis 5a and 3a.

Honesty-Humility is positively correlated with changes made in *High Gain* ($p = .042$). This opposes hypothesis 7a, which predicts that low *Honesty-Humility* scores lead to a higher inclination to adapt the business model rather than high scores. *Extraversion* is positively correlated with *High Gain* ($p = .045$), which builds support for hypothesis 2a. No statistically significant correlations between *Conscientiousness* or *Agreeableness* and any of the dependent variables were revealed. Furthermore, none of the correlations between any of the personality traits and business model adaptation in the domains of loss were statistically significant on the five per cent level.

Table 2: Pearson Correlation Coefficients of Independent and Dependent Variables

		HH	Em	Ex	Ag	Co	OE	Total	Total Gain	High Gain	Low Gain	Total Loss	High Loss	Low Loss
HH	Pearson Correlation	1												
	Sig. (2-tailed)													
Em	Pearson Correlation	,068	1											
	Sig. (2-tailed)	,513												
Ex	Pearson Correlation	,043	-,283***	1										
	Sig. (2-tailed)	,684	,006											
Ag	Pearson Correlation	,228**	,013	-,056	1									
	Sig. (2-tailed)	,027	,899	,593										
Co	Pearson Correlation	,181*	,014	-,027	,053	1								
	Sig. (2-tailed)	,080	,890	,798	,610									
OE	Pearson Correlation	,064	-,065	,221**	-,134	-,015	1							
	Sig. (2-tailed)	,541	,533	,032	,199	,889								
Total Changes	Pearson Correlation	,135	-,108	,047	,067	,050	,150	1						
	Sig. (2-tailed)	,194	,300	,652	,522	,635	,149							

Total Gain	Pearson Correlation	,139	**-.230****	**,180***	,056	,091	**.212***	.823***	1				
	Sig. (2-tailed)	,182	,026	,082	,592	,383	,040	,000					
High Gain	Pearson Correlation	**.210***	**-.250****	**.208***	,000	-,068	**.229***	.540***	.748***	1			
	Sig. (2-tailed)	,042	,015	,045	,998	,517	,026	,000	,000				
Low Gain	Pearson Correlation	,014	-,112	,077	,083	**,196***	,104	.724***	.796***	,194	1		
	Sig. (2-tailed)	,895	,281	,458	,429	,058	,317	,000	,000	,061			
Total Loss	Pearson Correlation	,097	,020	-,074	,058	,003	,061	.886***	.464***	.230**	.477***	1	
	Sig. (2-tailed)	,351	,851	,478	,576	,977	,561	,000	,000	,026	,000		
High Loss	Pearson Correlation	,031	,044	-,083	,136	,056	,055	.730***	.339***	,034	.471***	.860***	1
	Sig. (2-tailed)	,769	,673	,425	,192	,592	,600	,000	,001	,747	,000	,000	
Low Loss	Pearson Correlation	,137	-,011	-,044	-,037	-,052	,049	.790***	.458***	.363***	.347***	.856***	.472***	1
	Sig. (2-tailed)	,188	,918	,676	,725	,622	,636	,000	,000	,000	,001	,000	,000	

*. Correlation is significant at the 0.10 level (2-tailed).

**. Correlation is significant at the 0.05 level (2-tailed).

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

N = 94

HH = Honesty-Humility, Em = Emotionality, Ex = Extraversion, Ag = Agreeableness, Co = Conscientiousness, OE = Openness to Experience

4.3 Repeated Measures ANOVA

Repeated measures ANOVA was used to test hypothesis 1, which predicts higher business model adaptation inclination in the domain of potential loss than in the domain of potential gain. In a one way repeated measure ANOVA, the subjects are exposed to the same conditions and the dependent variable has the characteristics of a continuous variable. The data in the business model adaptation-variables are considered sufficiently continuous, and thus the necessary conditions are met.

Business model adaptation in the two domains was compared to find if there were significant differences between how many business model adaptation changes the participants chose in the domains. Initially, differences between the main domains, *Potential Gain* and *Potential Loss*, was examined. The means and standard deviations are presented in table 3. There was a significant effect for the domains, with Wilks' Lambda = .717, $F = 36.753$, $p < .0005$. However, the effect is the opposite of what was predicted in hypothesis 1. Business model adaptation was significantly higher in the domain of potential gain than in the domain of potential loss.

Table 3: Descriptive Statistics for Business Model Adaptation in the domain of Potential Gain and the domain of Potential Loss

	Mean	Standard Deviation	N
Potential Gain	4.6933	1.76206	94
Potential Loss	3.4078	2.16549	94

To gain a better understanding of the differences, the subcategories were compared using dependent t-tests. The most business model adaptation changes were made in the domain

of *High Gain*, followed by *Low Loss*, *Low Gain* and *High Loss*. While more changes were made in *Low Loss* than *Low Gain*, implying some indication of support for hypothesis 1, the effect is not statistically significant, as demonstrated in table 5. Other than that, all T-tests were statistically significant. There were significant differences in how much business model adaptation was proposed in each of the domains, but the findings oppose the predictions in hypothesis 1.

Table 4: Descriptives for Paired Sample T-Test

	Mean	Standard Deviation
High Gain	2.7562	1.08683
Low Gain	1.9371	1.19191
High Loss	1.3094	1.26509
Low Loss	2.0984	1.24835

Table 5: Paired-sample T-test for High Gain, Low Gain, High Risk and Low Risk

	High Gain – Low Gain	High Gain – High Loss	High Gain – Low Loss	Low Gain – High Loss	Low Gain – Low Loss	High loss – Low Loss
t	5.482	8.554	4.813	4.809	-1.121	-5.924
Sig. (2-tailed)	.000	.000	.000	.000	.265	.000

4.4 Regression Analysis

The regression analysis is based on the different business model adaptation variables as the dependent variables and the personality traits as the independent variables. Before performing the regression analysis, relevant assumptions were considered. The sample size of 94 was considered adequate, as it is within the minimum of accepted cases when considering the number of independent variables (Tabachnick & Fidell, 1989). Correlation between the independent variables was then examined. There was some correlation between the personality trait variables, as demonstrated in the Pearson correlation analysis. *Extraversion* and *Emotionality* correlated on the one per cent level ($p = 0{,}006$), as some of the variables on the five per cent level. The values are, however, so moderate that they do not indicate collinearity. When testing for multicollinearity, all tolerance levels were far higher than 0,20 and all VIF higher than 5. Therefore, there is no multicollinearity indicated (Christophersen, 2006). As stated in an earlier section, some outliers were found in the initial data screening and subsequently removed. The screening for multivariate outliers by examining the Mahalanobis distance scores and Cook's distance scores indicated no multivariate outliers. Residuals and scatterplots indicated that the linearity assumptions were supported, and the assumption of homoscedasticity was deemed satisfied based on the same method. There appeared to be a moderate deviation from normality, but the deviation was not deemed severe enough to deny the assumption of normality for the variables (Christophersen, 2006).

As the next tool to assess the hypotheses, a multiple linear regression analysis with the control variables and the personality traits was conducted, with the business model adaptation variables as the dependent variables. Two regressions were conducted, one for business model adaptation in the domain of potential gain (*Total Gain*) and one for business model adaptation in the domain of potential loss (*Total Loss*). In both regressions, step one consisted of assessing the impact of the control variables. In step two, the six

personality traits were included in the analysis. The regression statistics are shown in table 6 and 7.

4.4.1 Predicting Business Model Adaptation in the domain of Potential Gain

In table 6, the predictive effect of the control variables (*Age*, *Gender*, *Manager level* and *Years in position*) and the personality traits on business model adaptation in the domain of potential gain are shown. The dependent variable in this regression is *Total Gain*, that is average changes made per external change in the domain of potential gain. Step one of the analysis shows that one of the control variables, *Gender*, contributed significantly to the variance in the dependent variable, and *Gender* was therefore retained in hierarchical regression analysis. As the other three control variables displayed no significant correlation, they were excluded from the ensuing hierarchical multiple regression analysis. This was to prevent a reduction of the significance of the regression model due to a decline in the degrees of freedom by including a higher number of non-relevant, independent variables.

Including *Honesty-Humility* in the second step of the test did not explain any additional variance. In step three of the analysis, *Emotionality* contributed significantly to the regression model, and accounted for 8.2% of the variation in business model adaptation in the domain of *Potential Gain*. The effect was significant on the five per cent level ($p = .004$). *Extraversion*, *Agreeableness* and *Conscientiousness* did not significantly contribute to any variance in the dependent variable, and the explained variance through *Emotionality* and *Gender* therefore remains similar in Step 4 through 6. In Step 7, *Openness to Experience* explained an additional 3,2% of change in the dependent variable. However, the effect of *Openness to Experience* was not found statistically significant as a predictor of business model adaptation ($p = .072$). When all seven variables were included, *Gender* and *Emotionality* were the only significant predictors of business model

adaptation in the domain of potential gain. In total, the variables accounted for 17,9% of the variance. These results suggest that there is support for hypothesis 5a, that high *Emotionality* makes business model adaptation less likely in the domain of potential gain. The effect of *Openness to Experience* is an indication that there is some positive predictive power of the personality trait on business model adaptation in this domain. However, as the effect is statistically insignificant, the result of the analysis does not build support for hypothesis 3a. There is a positive relationship between business model adaptation and gender, which indicates that the female participants were more inclined to choose business model adaptation changes than men.

Table 6: Summary of Hierarchical Regression Analysis for variables predicting Business Model Adaptation in the domain of Potential Gain

Variable	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
Age	.077						
Gender	.899**	.811*	1.04**	1.003**	1.006**	.986**	.994**
Manager level	.076						
Years in position	-.038						
Honesty-Humility		.043	.048	.046	.047	.045	.038
Emotionality			-.109***	-.100**	-.100**	-.099**	-.099**
Extraversion				.033	.033	.034	.018
Agreeableness					-.002	-.002	.009
Conscientiousness						.010	.011
Openness to Experience							.055*
R^2	.076	.059	.141	.146	.146	.147	.179
Adjusted R^2	.033	.038	.112	.108	.098	.088	.112
ΔR^2		.005	.082	.005	.000	.001	.032
ΔF	1.760	1.091	2.094**	-1.087**	-.797*	-.522*	.174*

Note: Standard regression coefficients are shown.

*N = 100, *p>.10, **p<.05, ***p<.01,*

4.4.2 Predicting Business Model Adaptation in the domain of Potential Loss

Table 4 displays the predictive effect of the control variables (*Age*, *Gender*, *Manager level* and *Years in position*) and the personality traits on business model adaptation in the domain of potential loss. The dependent variable in this regression is *Total Loss*, that is average changes made per external change in the domain of potential loss. The analysis shows that no significant contribution was made by the control variables, and so to avoid a reduction of significance from the other variables, the control variables were excluded from the hierarchical analysis. The next six steps reveal that none of the personality traits contributes any significant variance in the dependent variable. Out of the six traits, *Honesty-Humility*, *Extraversion* and *Openness to Experience* have the larger impacts on the dependent variable, accounting for 0,9% 0,6% and 0,6% of the variation respectively. The effect is, however, not statistically significant. The completed model has an R^2 of 2,3%, which reflects that the model can objectively be considered to have little explanatory power. The results of the analysis do not support any of the proposed hypotheses on the loss side.

Table 7: Summary of Hierarchical Regression Analysis for variables predicting Business Model Adaptation in the domain of Potential Loss

Variable	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
Age	-.040						
Gender	.135						
Manager level	-.284						
Years in position	-.024						
Honesty-Humility		.048	.048	.050	.046	.048	.044
Emotionality			.006	-.005	-.004	-.004	-.004
Extraversion				-.041	-.039	-.040	-.048
Agreeableness					.016	.017	.022
Conscientiousness						-.009	-.009
Openness to Experience							.030
R^2	.048	.009	.010	.016	.017	.017	.023
Adjusted R^2	.004	-.001	-.012	-.017	-.027	-.039	-.044
ΔR^2		-.039	.001	.006	.001	.000	.006
ΔF	1.087	-.207	-.437	.036	-.101	-.073	.039

Note: Standard regression coefficients are shown.

*N = 100, *p<.10, **p<.05, ***p<.01*

4.5 Summary of Findings

In section 2.4 of this thesis, thirteen hypotheses are formulated. The Pearson analysis indicated some support for four of these, namely hypothesis 2a, 3a, 5a and 7a. All the supported hypotheses were based on the gain side of the domains. The regression analysis, which was carried out to explore the predictive ability of the personality traits, resulted in only hypothesis 5a being supported. *Emotionality* was found to impact business model adaptation negatively and was the only trait with a true moderating effect on the relationship between risk domains and business model adaptation. The impact of *Openness to Experience* was significant on a 10% significance level, but this was not deemed enough to build support for hypothesis 3a.

The overall results of the analysis appear to indicate little to no impact of most of the personality traits on the relationship between risk domains and inclination to adapt the business model. No significant results were found on the loss side and only one on the gain side. This is in contrast with what numerous contributors have concluded with previously in regards to personality and risk-taking (Peterson, et al., 2003; Dahlen & White, 2006; Weller & Tikir, 2011; Lee & Ashton, 2013; Dewberry, et al., 2013; Byrne, et al., 2015; Wang, et al., 2016; Kienzler, 2017). Implications of the results are discussed in the following chapter.

Table 8: Summary of findings

Hypotheses	Pearson Correlation	Repeated Measures ANOVA	Regression Analysis
Hypothesis 1: Leaders are more likely to propose business model adaptation in environments of perceived threat or potential loss than in environments of perceived opportunity or potential gain.		Opposed	
Hypothesis 2a: The higher the *Extraversion* score, the more likely is the leader to propose business model adaptation in the domain of potential gain.	Supported		Not supported
Hypothesis 3a: The higher the *Openness to Experience* score, the more likely is the leader to propose business model adaptation in the domain of potential gain.	Supported		Indicated, but not statistically significant
Hypothesis 5a: The higher the *Emotionality* score, the less likely is the leader to propose business model adaptation in the domain of potential gain.	Supported		Supported
Hypothesis 6a: The higher the *Conscientiousness* score, the more likely is the leader to propose business model adaptation in the domain of potential gain.	Indicated, but not statistically significant		Not supported
Hypothesis 7a: The lower the *Honesty-Humility* score, the more likely is the leader to propose business model adaptation in the domain of potential gain.	Opposed		Not supported

5. Discussion

The purpose of this thesis was to examine the relationship between personality traits and leader propensity to adapt the business model in different domains of risk. While there are numerous contributions on the relationships between personality and risk-taking, as well as business models and risk-taking, the aim of this study was to investigate whether personality traits acted as moderating variables between risk-taking and business model adaptation. With few significant relationships revealed in the analysis, this thesis still provides interesting scientific implications. The theoretical implications of the significant relationships found between *Emotionality* and business model adaptation, as well as the overall propensity of the participants to take more risk in domains of potential gain than in domains of potential loss, are discussed. Furthermore, the results may be valuable for practitioners aiming to achieve sustained competitive advantage and value creation as well. Research limitations are then considered to establish the actual significance of the study for both theorists and practitioners. Finally, potential for future research is considered.

5.1 Theoretical Implications

Altogether, the theoretical implications of the contributions made by this thesis is twofold: 1) The significant negative correlation between *Emotionality* and business model adaptation on the gain side contributes to the understanding of the trait's impact on risk-taking, and indicates potentially largely significant effects of personality traits on business model adaptation, and 2) as participants were found to take more risk in the domain of potential gain, the thesis builds support for rigidity theory rather than prospect theory.

The negative impact of high *Emotionality* on business model adaptation in the domain of potential gain is indisputably significant and stands out in a study with little other significant results. While there were no significant findings between the trait and business model adaptation on the loss side, the findings on the gain side accentuate the importance

of the personality trait in situations where potential large payoffs can be achieved if risky decisions are made. The risk aversion displayed by the participants with high *Emotionality* scores in the experiment is in line with many previous contributions. For example, Oehler & Wedlich (2018), using the five-factor model of personality, found that *Neuroticism* was related to high risk aversion in undergraduate business students. Self-employed individuals with high *Neuroticism*-scores have also been found to take less risk than others in that there is a significant negative effect on entry (Caliendo, et al., 2014), and it has been found that *Emotionality* was associated with less risk-taking in both the domain of potential gain and in the domain of potential loss (Weller & Tikir, 2011; Weller & Thulin, 2012). Some researchers have found opposing results. Wong & Carducci (2013) found that the five-factor model's *Neuroticism* was not connected to risk tolerance when personal financial risk tolerance was measured in university psychology students. Peterson et al. (2002) tested CEO *Neuroticism* and team-level risk aversion, and failed to find a significant relation. The conflicting results originate from research using the five-factor model, while studies using the HEXACO model have found mostly significant results when testing for correlations between *Emotionality* and risk-taking. As touched upon in the theory-chapter of this thesis, the HEXACO *Emotionality* trait has slightly more complex properties than *Neuroticism*. As mentioned, individual differences such as anxiety, sentimentality and empathy versus fearlessness, detachment and independence are assigned to the *Emotionality* trait in the HEXACO model (de Vries, et al., 2009; Weller & Thulin, 2012). The inclusions of these may help explain why *Emotional* individuals score lower on risk-taking behaviour such as business model adaptation.

Furthermore, risk-taking and business model adaptation is influenced by individuals' risk perception and risk propensity. Sjöberg & Wâhlberg (2002) found that *Neurotic* people perceive risk to be higher than individuals who were emotionally stable (Fyhri & Backer-Grøndahl, 2012). Weller & Thulin (2012) also link *Emotionality* to accentuated perceptions of risk. The rigid approach to risk-taking and business model adaptation displayed by the experiment participants with high *Emotionality* scores is therefore in line

with much of the previous literature on the subject. Therefore, while previous research and contributions where research on the HEXACO *Emotionality* trait and its corresponding five-factor model trait is somewhat equivocal, this thesis contributes further proof of the negative relationship between high *Emotionality* and risk-taking in leaders.

The second central theoretical contribution is related to the overall relationship between the risk domains and business model adaptation. While this study's primary aim was to establish a preliminary understanding of how personality traits might moderate the relationship between risk domains and business model adaptation, the base hypothesis on overall leader behaviour is of relevance for theory in the future. Hypothesis 1 predicted that business model adaptation would be more frequent on the loss side than on the gain side, and was opposed. While the hypothesised relationship was based on prospect theory, in that perceived threats in the environment lead to riskier behaviour, the results of the study indicate that threat rigidity theory is a more accurate explanation of this phenomenon.

As discussed in the theory-chapter of this thesis, both rigidity theory and prospect theory are supported by research (Tsai & Luan, 2016). Prospect theory is supported by the recent study by Saebi, et al. (2016), where Norwegian firms were found to take more risks in the domain of potential loss than in the domain of potential gain following the financial crisis. In addition to the already mentioned relevant findings on risk theories in literature, other findings supporting prospect theory include prospect theory explaining tax evasion (Dham & al-Nowaihi, 2007). Additionally, a sample of 3300 firms in 85 industries provided evidence that prospect theory explained the trade-off between risk and return (Fiegenbaum, 1990). An analysis of health insurance choice and risk preference found that most people were prospect theory types as opposed to utility theory types (Kairies-Schwarz, et al., 2017). The threat-rigidity theory also finds support in research. It has, for example, been found that threats leading to a reduction in control lead to more internally directed actions, which is one of the predictions of threat-rigidity theory (Chattopadhyay

& Huber, 2001). Researchers studying acquisitions also found support for the theory. When acquisitions were framed as threats, firms paid lower premiums. That is, they chose a less risky strategy (Meschi & Métais, 2015; Mcmanus & Sharfman, 2017). Tsai & Luan (2016) hypothesise that firm performance, risk-taking capabilities and interaction were found to correlate with risk-taking positively, and found support for the threat-rigidity argument when collecting data from the Taiwan Economic Journal. As demonstrated by these examples, as well as by those already discussed in the theory chapter, there are equivocal results from research predicting firm risk behaviour. This thesis provides some proof of threat-rigidity theory being an accurate description, and therefore adds to the contradictory conclusions drawn about the theories.

5.2 Practical Implications

Besides the theoretical implications, the results of the study also provide certain informational value for practitioners. The thesis provides further understanding of the business model adaptation concept and its applicability, as well as to how personality traits can predict inclination to adapt the business model in different domains of risk. The results are of particular value to firms aiming to create sustained competitive advantage and continuously capture and create value in their environments. This is most notably due to the main finding of the thesis on the impact of *Emotionality* on business model adaptation.

As discussed in the theory section of this thesis, the use of personality tests in general has been criticised (Johnson, et al., 1988; Furnham & Drakely, 2000; Stabile, 2002; Mischel, 2004). However, personality tests have been popular among recruiters for decades. Recruiters turn to personality tests to gather more meaningful information about an applicant than a standard reference check would typically yield (Johnson, et al., 1988). The results of this thesis indicate that there are in fact valid applications of personality tests. Managers without the skill or willingness to adapt the business model have been

found to act as barriers to change in firms (Massa & Tucci, 2013). One such barrier may be brought on by high *Emotionality* scores, and this is indicated by this thesis. Managers, entrepreneurs and recruiters ought to use knowledge of the negative effect of *Emotionality* on risk-taking when recruiting. They can consider *Emotionality* scores of applicants in jobs where risk-taking and an inclination to adapt the business model is of importance. Knowledge about the impact of personality traits is also useful when electing members for top management teams (TMTs), as it is often this team that determines if and when a business model is ultimately changed (Teece, 2018). Additionally, TMTs are considered essential to eliminate barriers to change (Anyanwu, 2016). As a focus on business model adaptation is crucial for continuous performance growth and sustainable competitive advantage, a consideration of applicant personality traits when making hiring decisions can be an indispensable source of competitive advantage for firms. Instead of acting as barriers, leaders with the appropriate set of personality traits could act as implementers of change and counteract path dependencies and business model rigidity.

To further highlight the potential benefits of considering personality traits when making hiring decisions if the goal is sustained value creation, the importance of business model adaptation ought to be revisited and the practical aspects highlighted. As discussed in the theory chapter of the thesis, adapting the business model is by many seen as essential if a firm is to continue to perform well. As mentioned, contributors have reported that business models should change in line with the competitive environment to achieve sustained competitive advantage (Achtenhagen, et al., 2013). Changes and innovations in the business model are considered crucial when firms aim to adapt to customer needs and continuously capture value (Teece, 2010). The business model itself is considered a tool to change and focus on innovation, with the potential to shake whole industries (Demil & Lecocq, 2010). A 2015 study on new ventures and business model adaptation found that adapting the business model was crucial for firms in their first years of life (Balboni & Bortoluzzi, 2015), and Andries & Debackere (2007) found that business model adaptation was especially beneficial for young, capital-intensive ventures. The importance of

business model adaptation in new ventures is especially interesting to entrepreneurs, but leaders and TMTs in older, more stable firms also ought to stay alert. Andries, et al. (2013) found that experimenting with the business model better facilitated long-term survival for firms, and Amit & Zott (2012) highlight the importance of innovating the business model by focusing on three reasons:

1) *Underused source of future value*

Business model innovation potentially represents an underused source of future value. Business model innovators have had faster growing operating margins and four times higher returns than product of service innovators (Amit & Zott, 2012; Bashir & Verma, 2017). Mitchell & Coles (2003) argue that continuing business model innovation can lead to a path of prosperity for a firm, because it can overpower established advantages and size. Firms aiming to enhance their performance may therefore benefit from leaders and top management team members with lower scores on the *Emotionality* trait, as these are more likely inclined to adapt the business model.

2) *Low imitability*

While incumbents have been known to respond to disruptive innovators with innovative business models, (Markides & Oyon, 2010; Matzler, et al., 2013; Huse, 2010; Gallagher, 2016), imitating a whole novel system is never as easy as imitating a simple product or service (Amit & Zott, 2012; Bashir & Verma, 2017). Low imitability of a competitive advantage is one of the characteristics that make for a *sustained* competitive advantage (Lien, et al., 2016). Hiring less *emotional* leaders with an inclination to adapt and innovate the business model may therefore be an important tool for firms aiming to use business model adaptation as a competitive advantage.

3) *Competitors may use it as a competitive tool*

> Firms are currently realising the potential benefits of business model adaptation. 54% of a sample of 4000 senior managers thought that new business models were a greater source of competitive advantage than new products and services (The Economist Intelligence Unit, 2005). Business model innovation has been pushed higher than expected on CEOs' priority lists (Amit & Zott, 2012). Hiring leaders and top management teams with appropriate personality traits to be prepared for and respond to competitor business model adaptation may therefore be crucial for long-term firm survival.

The importance of business model adaptation in firms, and the growing attention paid to it, is therefore indisputable. As high *Emotionality* in leaders makes for leaders that are less willing to adapt the business model when there is a potential for future gain, highly *emotional* leaders may be detrimental for firms aiming to achieve sustained competitive advantage. The main practical implication of this thesis is therefore that a deliberate recruitment strategy of leaders and TMT members in firms, where personality traits of leaders also facilitate business model adaptation, is vital if firms want to use business model adaptation as a competitive tool.

5.3 Limitations

Naturally, there are multiple limitations to the scope and applicability of the findings in this thesis. Methodological limitations are addressed, such as sample size and characteristics, the limitations of self-reported data and the methodology used to collect data.

Firstly, the size and characteristics of the sample ought to be discussed. While much effort was put into ensuring a large enough sample size, and a response rate of 35% is in fact quite high, the final sample of 94 is still relatively small. This is likely the reason most of the control variables were found non-significant and mostly had to be excluded in the regression analyses. Furthermore, the small sample size may have resulted in more

nuanced effects going unnoticed. It may also be an indication of non-response bias, where potential respondents possessing particular traits choose not to participate in for example a survey. This leads to a reduction in the representativeness of the sample (Hansen & Hurwitz, 1946).

Additionally, the characteristics of the sample may be a cause for concern. As discussed, 35% of the respondents were males between the ages of 45 and 54, and this may have influenced the overall findings of the analysis. However, the control variables were rarely significant: *Gender* was only a significant variable when testing on the gain side, and *Age* was insignificant in both regression analyses. The small sample size may have been the reason for the lack of significance. The low percentage of female respondents may also have been a contributing factor. Furthermore, the influence of respondent age may have been more apparent and significant if the respondents answered in one-year increments instead of ten-year increments. The exact influence of age and gender is therefore unclear in this study. Even though the distribution of the sample appears similar to the actual gender and age distribution among Norwegian leaders (Futsæter, 2016; Statistics Norway, 2016), this may limit the applicability of the results. A more even distribution of participant age and gender would have been preferable. Furthermore, the respondents appear to score relatively similarly on the personality trait test, as demonstrated in section 4.1. The central tendencies were quite high for four of the traits. Only one of the traits had a central tendency close to 25, which represents a neutral score on the trait. Standard deviations were also low. This may also be an accurate representation of Norwegian leaders, but it limits the possible outcomes of the survey and analysis.

Next is the possible limitations of self-reported data. Firstly, there is some dispute among researchers about the agreement between self-rated and peer-rated personality (Ready, et al., 2000; Paunonen & O'Neill, 2010). Additionally, when using self-reported surveys, the researcher is dependent on the participants' honesty. Survey participants may give false answers because they would rather answer questions in a socially desirable way. This is called *social desirability bias*. *Response bias* is another concern, and refers to a

participant tendency to answer in a certain way regardless of the question (Demetriou, et al., 2015). Self-reporting has been defended by researchers as well as criticised. Defenders have argued that while there is potential for bias in self-report surveys, there is no excuse for "dismissing a potentially important source of insight into human experience just because it is inconvenient or it requires care to put into practice" (Norwick, et al., 2002). While the self-report nature of the personality test does not annul the data, there is likely some bias in the responses.

Furthermore, the methodology employed to collect data is considered. Primarily, it is suspected that the experiment failed to create an adequate scenario for the participants, and their choices are therefore unlikely mirrored in their everyday lives. This may be the reason few significant results were found in the analysis. Using similar questions to the ones used in the 2016 article provided this thesis with a slightly higher test-retest reliability than if the questions had been developed from scratch. However, while the experiment was based on existing research on business model adaptation and its drivers (Saebi, et al., 2016), it still likely lacks some reliability and validity. As a preliminary step towards finding a way of measuring the business model adaptation inclination it has proved useful, but it is an underdeveloped and untested method with unclear quality. If a similar method is to be used in future research, the experiment should be revised and re-examined, and other methods considered. It may be so that other measures, such as interviews or questionnaires, will prove more accurate in collecting data on leader inclination to adapt the business model.

A final methodological limitation is the rather small number of control variables. In the interest of keeping the survey and experiment short and easy and ensuring anonymity, control and descriptive variables were limited. In hindsight, other variables, such as strategic orientation and firm size, would have been useful and interesting for analysis purposes. More accurate data on age would also have been useful.

5.4 Future research

The findings of this study and the resulting discussion on theoretical and practical implications also present implications for future research. In future research, the present work should be replicated on a larger sample and possibly on a sample where ages and genders are more equally distributed. A sample that is not exclusively Norwegian is also needed. This will confirm or deny the applicability of the study to other research and practical applications. However, limitations of the existing study, such as those presented in the previous section, need to be addressed before any attempts at replication is carried out.

Firstly, future research on business models and business model adaptation is addressed. The business model adaptation concept is a new one. It is still a relatively fuzzy term in the social sciences perspective, as proven by the various terms explaining similar concepts presented in the theory chapter of the thesis. There is an exciting potential for the measurement tools to be reworked and better defined in future research. This thesis has contributed to this cause, but further operationalisation is necessary to establish a measurement method that is predictive and accurate (Saunders, et al., 2015). The experiment helped solve one of the main issues in Saebi, et al. (2016)'s measurement method, where data on the gain side was lacking. Because of the design of the experiment, data were collected on both domains from all participants. However, different measurement methods ought to be explored and tested. Qualitative methods may be an interesting approach to operationalise the concept, or even more detailed surveys. While this experiment was conducted with limited time and resources, it can form the basis of larger-scale lab experiments in which participants can be grouped according to their personality traits. This can yield fascinating results on both group level research and on individual leader level decision-making.

Business model is a trendy term for both practitioners and theorists, and inclinations to adapt the business model is undoubtedly a theme that is of interest to both groups. For

managers and entrepreneurs especially, *business model adaptation* is becoming a well-known term (Amit & Zott, 2012). Not focusing on business model adaptation can mean competitors will outperform you, and business model adaptation is crucial for sustained value creation (Achtenhagen, et al., 2013; Teece, 2010). This proves the relevance of the thesis, as well as the relevance of future research on the topic. Future research ought to have a closer look at business model adaptation as presented in this thesis. Furthermore, research on business model *rigidity* and potential *drivers* is also of interest to both researchers and practitioners. As mentioned in the theory chapter, leadership and a willingness to experiment are not the only capability necessary for successful business model adaptation. Organizational capabilities also matter (Doz & Kosonen, 2010; Achtenhagen, et al., 2013), and more research into these are of value to future researchers and practitioners. Additionally, the term business model adaptation ought to be agreed upon, as many contributors still use various terms explaining a similar concept (Saebi, et al., 2016). Examples are business model *innovation, evolution, replication, learning, renewal* and *transformation* (Dunford, et al., 2010; Demil & Lecocq, 2010; Doz & Kosonen, 2010; Aspara, et al., 2013; Teece, 2010; Casadesus-Masanell & Zhu, 2013).

Secondly, there is a potential for future research on risk-taking. In the theory chapter of this thesis, different theories of risk were presented, and two leading theories, rigidity theory and prospect theory, were discussed in more depth. While the purpose of this study was not to prove or disprove either of these theories, they were important indicators of what to expect in the different domains. The hypothesis predicting prospect theory to be the better judge of how individuals would behave generally, i.e. that more business adaptation would be preferred in the domain of potential loss than in the domain of potential gain, was opposed. There were significantly more changes made on the gain side than on the loss side. *Emotionality* was negatively correlated with risk-taking on the gain side, meaning highly *emotional* individuals therefore acted in accordance with prospect theory. However, the overall effect was that the participants acted in accordance with threat-rigidity theory. This thesis therefore adds to the already equivocal views and

results of previous research. It does, however, provides some support for the proposition that personality traits act as a moderator of the relationship between risk domains and business model adaptation. This therefore provides grounds for further research on the personality as a moderating variable. Other potential moderating or mediating variables ought to be explored as well.

Thirdly, future research on personality traits ought to be considered. The results of many research papers on personality and risk-taking are equivocal, and this thesis adds to the uncertain effect of personality traits on risk-taking in firms. It can be argued that this thesis further proves the unpredictable nature of personality tests. However, that personality traits influence decision-making depending on situational factors (Mischel, 2004) appears unarguable, and their influence on decision-making is likely substantial (Dewberry, et al., 2013). Therefore, there is a need for further studies on personality traits, and for researchers to address whether existing tests measure personality in accurate and reliable ways. Additionally, further studies on the individual traits are needed. While this thesis found that *Emotionality* was negatively related to business model adaptation, and that *Emotionality* may be harmful for business model adaptation, that is not to say that *emotional* individuals necessarily always make for bad leaders. For example, it has been argued that the affect heuristic, a mental shortcut where current emotions such as fear, pleasure or surprise, allows individuals to make decisions quickly, allows us to be rational actors in most situations (Slovic, et al., 2004). Future research on the complex dynamics of the personality traits is therefore of relevance.

In addition to the moderating effect of personality traits on business model adaptation in different risk domains, other variables are interesting to consider as well. Team dynamics likely has an impact on business model decision-making and both individual and group propensity to adapt the business model, as well as top management team characteristics such as age, gender, professional background, education, financial position or socioeconomic roots (Hambrick & Mason, 1984). Across industry and organisation

research, as well as cross-cultural studies, ought to be carried out to eliminate any cultural or industry effects.

6. Conclusion

The overall goal of this thesis was to examine the relationship between personality, risk-taking and business model adaptation in domains of potential loss and domains of potential gain. Primarily, the aim was to establish a preliminary understanding of the relationship between these variables, and to see if personality would act as a moderator between risk domains and business model adaptation. In general, potential gain lead to higher business model adaptation than potential loss, which was the opposite of the proposed relationship. Only *Emotionality* was found to impact business model adaptation in the domain of potential gain significantly, and only this trait significantly altered the way participants made choices in the experiment. No significant correlations were found on the loss side. It is, however, suspected that there are significant relationships between the variables, but that this thesis was unsuccessful in demonstrating them. Multiple previous research papers have found significant relationships between personality traits and risk-taking behaviour. The lack of significant results in this thesis may be due to the sample characteristics or the methodology employed, rather than there not being significant relationships. The findings on the negative relationship between *Emotionality* and business model adaptation on the gain side are, however, highly relevant to leaders, entrepreneurs, top management teams and researchers aiming for sustained competitive advantage and value creation. There is excellent potential for further research on the subjects. Any future research on business model adaptation will further the understanding of the term and what it entails, and help operationalise the concept and the measurement methods.

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Appendix

Appendix A

Survey Items HEXACO model, English version (Norwegian translation used by participants), without Introduction, Additional information and Instructions.

Participants answer using the following scale:

5 = strongly agree

4 = agree

3 = neutral (neither agree nor disagree)

2 = disagree

1 = strongly disagree

1. I would be quite bored by a visit to an art gallery.
2. I plan ahead and organise things, to avoid scrambling at the last minute.
3. I rarely hold a grudge, even against people who have badly wronged me.
4. I feel reasonably satisfied with myself overall.
5. I would feel afraid if I had to travel in bad weather conditions.
6. I wouldn't use flattery to get a raise or promotion at work, even if I thought it would succeed.
7. I'm interested in learning about the history and politics of other countries.
8. I often push myself very hard when trying to achieve a goal.
9. People sometimes tell me that I am too critical of others.
10. I rarely express my opinions in group meetings.
11. I sometimes can't help worrying about little things.
12. If I knew that I could never get caught, I would be willing to steal a million dollars.
13. I would enjoy creating a work of art, such as a novel, a song, or a painting.
14. When working on something, I don't pay much attention to small details.
15. People sometimes tell me that I'm too stubborn.
16. I prefer jobs that involve active social interaction to those that involve working alone.

17. When I suffer from a painful experience, I need someone to make me feel comfortable.
18. Having a lot of money is not especially important to me.
19. I think that paying attention to radical ideas is a waste of time.
20. I make decisions based on the feeling of the moment rather than on careful thought.
21. People think of me as someone who has a quick temper.
22. On most days, I feel cheerful and optimistic.
23. I feel like crying when I see other people crying.
24. I think that I am entitled to more respect than the average person is.
25. If I had the opportunity, I would like to attend a classical music concert.
26. When working, I sometimes have difficulties due to being disorganised.
27. My attitude toward people who have treated me badly is “forgive and forget”.
28. I feel that I am an unpopular person.
29. When it comes to physical danger, I am very fearful.
30. If I want something from someone, I will laugh at that person's worst jokes.
31. I’ve never really enjoyed looking through an encyclopaedia.
32. I do only the minimum amount of work needed to get by.
33. I tend to be lenient in judging other people.
34. In social situations, I’m usually the one who makes the first move.
35. I worry a lot less than most people do.
36. I would never accept a bribe, even if it were very large.
37. People have often told me that I have a good imagination.
38. I always try to be accurate in my work, even at the expense of time.
39. I am usually quite flexible in my opinions when people disagree with me.
40. The first thing that I always do in a new place is to make friends.
41. I can handle difficult situations without needing emotional support from anyone else.
42. I would get a lot of pleasure from owning expensive luxury goods.
43. I like people who have unconventional views.
44. I make a lot of mistakes because I don’t think before I act.
45. Most people tend to get angry more quickly than I do.
46. Most people are more upbeat and dynamic than I generally am.
47. I feel strong emotions when someone close to me is going away for a long time.

48. I want people to know that I am an important person of high status.
49. I don't think of myself as the artistic or creative type.
50. People often call me a perfectionist.
51. Even when people make a lot of mistakes, I rarely say anything negative.
52. I sometimes feel that I am a worthless person.
53. Even in an emergency I wouldn't feel like panicking.
54. I wouldn't pretend to like someone just to get that person to do favours for me.
55. I find it boring to discuss philosophy.
56. I prefer to do whatever comes to mind, rather than stick to a plan.
57. When people tell me that I'm wrong, my first reaction is to argue with them.
58. When I'm in a group of people, I'm often the one who speaks on behalf of the group.
59. I remain unemotional even in situations where most people get very sentimental.
60. I'd be tempted to use counterfeit money, if I were sure I could get away with it.

Appendix B

Survey items Business Model Adaptation experiment, without Introduction, Additional information and Instructions.

1. Has your firm experienced, or are you experiencing at this moment, any of the following external changes? Choose at least two.
    - Changes in customer preferences
    - Changes in bargaining power towards suppliers
    - Technological changes in the industry
    - Changes in the competitive environment
    - None of the above

(For each of the chosen external changes)

2. You have crossed of that *external change* is experienced or has been experienced by your firm now or previously. Which of the following changes do you propose for your firm?

    Read the probabilities for loss and gain closely – they change for each question.

(Replicate 1)

No change: 100% chance of gain of 50

All other options: 90% chance of gain of 100, 10% chance of loss of 100.

(Replicate 2)

No change: 100% chance of gain of 50

All other options: 60% chance of gain of 100, 40% chance of loss of 100.

(Replicate 3)

No change: 100% chance of loss of 50

All other options: 40% chance of gain of 100, 60% chance of loss of 100

(Replicate 4)

No change: 100% chance of loss of 50

All other options: 10% chance of gain of 100, 90% chance of loss of 150.

Options presented to the participants:

- No change
- Change number of products or services
- Change price of products or services
- Increase sales efforts towards new customers or customers abroad
- Adjust relationships towards suppliers and/or partners
- Search for new suppliers and/or partners
- Reorganise the organization