

# The influence of uncertainty and cultural tightness-looseness on the decision-making processes of entrepreneurs in South Africa

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**Abstract** Entrepreneurs are of fundamental importance in a fast-changing economy. But how do entrepreneurs make their choices and which factors influence these choices? This study focused on the influence of cultural tightness-looseness and uncertainty on the decision-making process of entrepreneurs. To examine this, data of 230 entrepreneurs were collected in South Africa. The outcomes show a positive significant effect of the perceived cultural tightness on the use of causation, while cultural tightness does not influence the use of effectuation. The perceived cultural tightness has a positive significant effect on the level of uncertainty of an entrepreneur. Moreover, the level of uncertainty has a significant positive effect on the use of causation and does not affect the use of effectuation. By adding empirical data, there is more insight into the antecedents of causation and effectuation and increase the reliability and validity of the different measurement scales. The results indicate that perceived cultural tightness and uncertainty influence the usage of causation. More research is needed to test the reliability of these outcomes. More cross-country research is needed to test the robustness of the possible antecedents on the decision-making process of entrepreneurs. To increase the understanding of different antecedents that affect causation and effectuation.

**Keywords** Entrepreneurs · Effectuation · Causation · Uncertainty · Culture · Decision-making

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## Preface

“It always seems impossible, until it’s done”. – Nelson Mandela

This quote fits in very well with this research, as well as for me personally. A few years ago, I never imagined that I would ever be able to get my master’s degree. After a year of intense work and an incredible amount of learning, even this goal is achieved. Besides that, many South African entrepreneurs also used this quote during meetings. Some entrepreneurs have big ideas that seem impossible at the moment, but they stick to their dream and have Mandela in mind. In a country where the gap between rich and poor is the highest in the world and where racism is still visible, entrepreneurs must remain positive and believe in themselves and their ideas. There is still a long way to go for South Africa in the development of equality, but: it always seems impossible, until it's done.

I would like to thank all 230 entrepreneurs for completing the survey, the educational discussions about entrepreneurship, passion and perseverance. It is so special that entrepreneurs spend a lot of time in their busy lives helping students from the Netherlands. There are beautiful friendships made with entrepreneurs and I am very inspired by all the life stories of the entrepreneurs that are sometimes very poignant. Of all the 52 meetings, I would like to thank a few entrepreneurs personally. Christiaan van den Berg, Rudolph du Toit, Neil du Preez, Patricia September, Edward Ellis and Michelle Lingham have particularly ensured that the dataset has become such a success for which I thank them.

I would also like to thank my dear friend and fellow student, Bob van Essen, for his help in South Africa. Together we were a real team in convincing every entrepreneur why our research is so important to South Africa. Besides that, we also had a lot of fun. I would like to thank dr. Martin Stienstra for his professional guidance. His passion for Sarasvathy's theory made me really enthusiastic and thanks to Martin, I was well prepared to leave for South Africa. And I would like to thank dr. Raymond Loohuis for reading my thesis.

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# Contents list

<b>List of tables and figures</b> .....	<b>4</b>
<b>1. Introduction</b> .....	<b>5</b>
<b>2. Theoretical framework</b> .....	<b>7</b>
2.1 <i>Decision-making process: Effectuation vs. Causation</i> .....	7
2.2 <i>Cultural tightness-looseness</i> .....	9
2.3 <i>Uncertainty</i> .....	10
2.4 <i>Hypotheses</i> .....	11
<b>3. Methodology</b> .....	<b>13</b>
3.1 <i>Sample</i> .....	13
3.2 <i>Sampling methods</i> .....	15
3.3 <i>Methods of analysis</i> .....	15
3.4 <i>Control variables</i> .....	16
<b>4. Results</b> .....	<b>16</b>
4.1 <i>Scale validation</i> .....	16
4.2 <i>Descriptive statistics</i> .....	18
4.3 <i>Correlations</i> .....	19
4.4 <i>Hypotheses testing</i> .....	19
<b>5. Conclusion</b> .....	<b>24</b>
<b>6. Discussion</b> .....	<b>24</b>
6.1 <i>Theoretical contribution</i> .....	25
6.2 <i>Practical implication</i> .....	26
6.4 <i>Limitations</i> .....	26
6.5 <i>Future research</i> .....	26
<b>7. References</b> .....	<b>28</b>
<b>8. Appendix</b> .....	<b>34</b>
<i>Appendix A: Measurement scale of causation and effectuation</i> .....	34
<i>Appendix B: Measurement scale of culture</i> .....	34
<i>Appendix C: Measurement scale of uncertainty</i> .....	35
<i>Appendix D: Cronbach's Alpha</i> .....	36
<i>Appendix E: Test of normality</i> .....	37
<i>Appendix F: Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's test of Sphericity</i> .....	39
<i>Appendix G: Factor analysis</i> .....	39
<i>Appendix H: Assumptions for hierarcical multiple regression</i> .....	42

## List of tables and figures

**Table 1:** Contrasting causation and effectuation

**Table 2:** Sub-constructs causation and effectuation

**Table 3:** Overview hypotheses

**Table 4:** Descriptive statistics dataset

**Table 5:** Descriptive statistics variables

**Table 6:** Overview of correlations

**Table 7:** Hierarchical multiple regression H1

**Table 8:** Hierarchical multiple regression H2

**Table 9:** Hierarchical multiple regression H3

**Table 10:** Hierarchical multiple regression H4

**Table 11:** Overview of the tested hypotheses

**Figure 1:** Systems model of cultural tightness-looseness

## 1. Introduction

Entrepreneurs add great value to local economies. Entrepreneurs are recognized as a vital source of economic growth. The success of entrepreneurs can have a major impact on the economic growth of an economy (Henderson, 2002). Entrepreneurs are identified with dominant individual characteristics. They have a strong commitment to their business idea and are independent-minded (Shapiro, 1975). The core characteristics of a successful entrepreneur are competence, imagination, commitment and confidence (Van de Ven, Hudson & Schroeder, 1984). Alvarez and Barney (2007) mention that first decisions of entrepreneurs are taken in the light of uncertainty. A concept which is central to entrepreneurs. Entrepreneurs are expected to have the courage to take risks and innovate. Uncertainty of an individual has influence on the strategy of a firm (Von Gelderen, Frese, & Thurik, 2000). Also, the environment in which an entrepreneur operates influences the choices that an entrepreneur makes (Gartner, 1985). In making decisions, the uncertainty of an entrepreneur also influences these decisions (Rajagopalan, Rasheed, & Detta, 1993).

The decision-making process of entrepreneurs are highly fragmented. It is difficult to take stock how these decisions are made. A better understanding of when, where, why and how entrepreneurs make decisions is of great relevance (Shepherd, Williams, & Patzelt, 2015). Sarasvathy (2001a) divides two different ways of decision-making processes of an entrepreneur. Namely, a causation- and effectuation approach. Effectuation and causation are two core concepts of emerging theories in the observation of entrepreneurial actions (Fisher, 2012). Causal decision-making process stands in contrast to effectual decision-making process (Stienstra, Harms, van der Ham, & Groen, 2012). A causation approach uses the reasoning that with setting up a business, a plan is needed to be more effective. A planned approach tackles risk and looks at all the possibilities before choices are made. By

planning, an entrepreneur tries to predict the future based on all the information. In an uncertain environment, a planned approach can help to create a stable new venture (Perry, Chandler, & Markova, 2012). An effectuation approach means that an entrepreneur does not make pre-determined goals. Instead, goals emerge from negotiations and in the process frequently transform into new goals. Effectuation is non-predictive, it does not require certain predications, nor clear set goals or an adaptive attitude towards an exogenous environment (Dew, Read, Sarasvathy, & Wiltbank, 2008). Sarasvathy (2001a) argues that experienced entrepreneurs are using an effectual approach in the decision-making process, while unexperienced entrepreneurs use a causational approach in the decision-making process (Sarasvathy, 2009). Research on possible antecedents of effectuation and causation remains limited (Engel, Dimitrova, Khapova, & Elfring, 2014).

Mintzberg (1973) argues that entrepreneurs operate in an uncertain environment. The degree of uncertainty influences the choice of entrepreneurs. They constantly weigh up the options to make the right choice. *“In the entrepreneurial mode, strategy-making is dominated by the active search for new opportunities” as well as “dramatic leaps forward in the face of uncertainty”* (p.45). An uncertain environment ensures that entrepreneurs react quickly and effectively to extensive changes in a wide range of external conditions (Baron, 2008; Lichtenstein, Dooley, & Lumpkin, 2006). Uncertainty occurs among entrepreneurs in an unstable environment. The distrust of the government and other entrepreneurs increases the uncertainty. A trusted environment actually removes uncertainty (Anokhin & Schulze, 2009). People who can't get a grip on unexpected events are likely to interpret any ambiguity in information as a threat (Heydayati, Dugas, Buhr, & Francis, 2003). In a highly complex and uncertain environment, predicting becomes more difficult. Decision makers could do better to

seek beneficial results by using decision-making technologies that minimise their reliance on predictions (March, 2006). A study of expert entrepreneurs showed that they avoided the use of prediction in dealing with all the uncertainties involved in building new ventures, the “logic of non-predictive control” (Sarasvathy, 2001b). A better understanding of uncertainty and its origins can contribute to better choices being made in uncertain situations (Tversky & Kahneman, 1974). And an entrepreneur who is not uncertain, is more likely to be successful (Sarasvathy, Menon, & Kuechle, 2013).

Entrepreneurial activities are also influenced by uncertain environments like a national culture (Hayton, George, & Zahra, 2002). Hopp and Stephan (2012) indicate the influence of a national culture on the decision-making process of an entrepreneur. Socio-cultural norms have impact on individual beliefs of entrepreneurs. Culture influences their confidence that they have the competencies to create an operational venture (entrepreneurial self-efficacy) and the motivation of an entrepreneur to work hard (start-up motivation). Entrepreneurs who fit well into the cultural context of a country are more likely to be successful. Especially in a performance-based environment, a highly driven and highly self-efficacious entrepreneur is more likely to succeed. A supportive environment, where the government provides access to valuable resources, also enhances the potential for entrepreneurial success (Hopp & Stephan, 2012). The most used theory to measure a national culture are the cultural dimensions of Hofstede (1984; 2001).

Tung and Verbeke (2010) mention the deep division among cross-cultural research. There is increasing recognition that inhabitants of a particular country can be very different from each other. It is important to move beyond traditional cultural dimensions in order to improve the better understanding of cross-cultural research. McSweeney (2002) argues that singular theories, like Hofstede’s cultural

dimensions, are problematic. A uni-level analysis of a culture does not consider micro- and macro cultures within a society. Gelfand, Nishii and Raver (2006) argue that an exclusive focus upon cultural values is inadequate to grasp this complexity. Intra-national diversity can be very different within a country and completely different from the country next to it. In this context, the work of Gelfand et al. (2011) has shown promises for the cultural dimensions of tightness-looseness. Cultural tightness-looseness consist of two key components: the strength of sanctioning or tolerance and the strength of social norms (Gelfand et al., 2006). A tight culture has many norms and a low tolerance of deviant behaviour, a loose culture has weak social norms and a high tolerance of deviant behaviour (Gelfand et al., 2011). The concept of cultural tightness-looseness fits better as a measurement of culture, as it complements existing measures of different cultural dimensions.

Extant research provides a lot of information about the differences between causation and effectuation. The main purpose of this study is to give more insights in the influence of culture and uncertainty on the decision-making process of entrepreneurs. Literature indicates a possible effect of cultural tightness and personal uncertainty on the decision-making process of an entrepreneur. An entrepreneur who experiences the culture as tight may have a higher degree of uncertainty and makes different decisions. Therefore, uncertainty will also be tested as a moderator effect on the relationship between cultural tightness-looseness and effectuation and causation. Combining the influence of culture tightness or looseness, which differ from country to country, on the decision-making process and the level uncertainty which may influence the decision-making process the following research question has been conducted:

**To what extent are entrepreneurial decision-making processes influenced by cultural tightness and uncertainty?**

To test the hypothesis, 230 entrepreneurs in South Africa filled out the questionnaire. This questionnaire makes culture measurable in terms of tightness or looseness, the level of uncertainty of an entrepreneur and what approach they make in the decision-making process, a causation or effectuation approach. The outcomes of this questionnaire will be tested in SPSS.

This research begins with a theoretical framework. In this theoretical framework, the key concepts of effectuation and causation, uncertainty and cultural tightness-looseness are further elaborated. Different models are shown to support a visualization of these concepts. Furthermore, the hypotheses are drawn up to test the relationships between these key concepts. The methodology will be examined in the next chapter. This chapter describes the method on which the data is collected and how this data is evaluated. The findings are shown after the methodology, in this chapter the outcomes of the questionnaires have been processed. The outcome of the hypotheses will be compared with each other and additional results are displayed. Afterward, a conclusion is drawn for this study which will give answer to the main research question. A discussion about the study and possibilities for future research has been described.

## 2. Theoretical framework

The theoretical framework starts off by describing the decision-making process of entrepreneurs which can be divided in an effectuation- or causation approach. The different dimensions are described in order to clearly identify the differences between effectuation and causation. Afterwards, the concept of uncertainty is worked out. Then the concept of culture is elaborated on the basis of cultural looseness and tightness. Ultimately, hypotheses are formulated and processed in a framework to visualize the hypotheses.

### 2.1 Decision-making process: Effectuation vs. Causation

The first theory about the decision-making process of entrepreneurs was written by Sarasvathy, in this article the difference between effectuation and causation were described as follows: “*Causation processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means*” (Sarasvathy, 2001a, p. 245). Effectuation and causation are different approaches in the decision-making process of an entrepreneur, they are not considered as mutually exclusive. Different approaches are used in different situations, neither effectuation nor causation is a better approach or concept than another (Perry et al., 2012). In 2001, Sarasvathy drew up a framework, shown in table 1, with the most important differences between causation and effectuation. In 2009 this framework was adjusted by Sarasvathy to five different sub-constructions. These sub-constructs clarify the difference, as shown in table 2. The five sub-constructs are 1) taking actions, 2) risk and resources, 3) attitude towards others, 4) attitude towards unexpected events, 5) view of the future.

#### 2.1.1 Taking actions: Means vs. Ends

‘Effectuators’ are means-oriented, by devising action lines based on given resources, objectives will emerge. The effectual entrepreneur does not start defining markets or predetermined effects, instead they start with identifying a set of means. Means can be categorized in three different aspects, ‘what I know’, ‘who I am’ and ‘whom I know’. Then an entrepreneur proceeds to creating and choosing between different possible effects in a contingent way, constantly creating new opportunities and taking full advantage of new opportunities (Sarasvathy, 2009).

Who gets on board also decides what can and should be done, not the other way around. In a

## Contrasting Causation and Effectuation

Categories of differentiation	Causation Processes	Effectuation Processes
Givens	Effect is given	Only some means or tools are given
Decision-making selection criteria	Help choose between means to achieve the given effect Selection criteria based on expected return	Help choose between possible effects that can be created with given means Selection criteria based on affordable loss or acceptable risk
Competencies employed	Effect dependent: Choice of means is driven by characteristics of the effect the decision maker wants to create his or her knowledge of possible means Excellent at exploiting knowledge	Actor dependent: given specific means, choice of effect is driven by characteristics or the actor and his or her ability to discover and use contingencies Excellent at exploiting contingencies
Context of relevance	More ubiquitous in nature More useful in static, linear, and independent environments	More ubiquitous in human action Explicit assumption of dynamic, nonlinear, and ecological environments
Nature of unknowns	Focus on the predictable aspects of an uncertain future	Focus on the controllable aspects of an unpredictable future
Underlying logic	To the extent we can predict future, we can control it	To the extent we can control future, we do not need to predict it
Outcomes	Market share in existent markets through competitive strategies	New markets created through alliances and other cooperative strategies

*Table 1: Contrasting Causation and Effectuation (Sarasvathy, 2001a, p.251)*

causal framework, entrepreneurs are goal-oriented, even when they are constrained by limited means. Goals determine actions, including which individuals should participate (Dew, Read, Sarasvathy, & Wiltbank, 2009).

### *2.1.2 Risk and Resources: Affordable loss vs. Expected returns*

Affordable loss is a component of effectuation, entrepreneurs look at how much they are prepared to lose as much as possible if their business fails. How much risk can a company bear and can this be overseen. The entrepreneur accepts the losses in case that the enterprise fails. Where managers of large companies are always looking for markets with maximum returns, entrepreneurs are often looking for how to reach a certain market with as little expenditure as possible, think of time, money and effort (Sarasvathy, 2001c). Affordable loss frames the problem of pursuing market opportunities without actually investing in them. The emphasis in this approach is on preventing possible losses, which fits within the frame of effectuation (Dew et al., 2009). In the start-up stage of a firm, affordable loss becomes an important criterion in the decision-making

process (Chandler, DeTienne, McKelvie, & Mumford, 2011).

Entrepreneurs who follow the principle of expected returns are using a causation approach. The focus is not on limiting resources but on achieving maximum results with an intended strategy, as shown in table 1. The focus is on the upside potential (Sarasvathy, 2001a).

### *2.1.3 Attitude towards others: Commitment vs. Competitive analysis*

Effectuators rely on pre-commitments and strategic alliances rather than competitive analysis. Through commitments via a network of investor, partner and customer stakeholders, effectuators try to build their business. Effectuation distinguishes three different intangible ways in which the effectuator cocreates new ends. Think of new firms, products and services, and markets. This is created through an iterative and interactive process of stakeholder acquisition (Read, Dew, Sarasvathy, Song, & Wiltbank, 2009). The effectuation approach does not focus on being competitive but on building partnerships. Build a market together with suppliers, customers and even possible potential competitors

(Sarasvathy, 2009). To achieve a strategic partnership, entrepreneurs should work together with others, which results in commitment to the entrepreneur new venture, where different people carry risk (Chandler et al., 2011).

Causal logic suggests that an entrepreneur would make a competitive analysis and estimate the risk. By entering into competition an entrepreneur tries to distinguish himself from his competitors (Sarasvathy, 2009). Competitive analysis is a key input in formulation a strategy (Porter, 1979). Chandler et al. (2011) argue that pre-commitments playing a role in both the causation and effectuation processes.

*2.1.4 Attitude towards unexpected events: Exploiting contingencies vs. pre-existing knowledge*

Causal models always seek to avoid the unexpected, or, despite unforeseen circumstances, to achieve predetermined goals. An effectuator makes use of these situations. They treat unexpected events as an opportunity to achieve control over emerging situations (Sarasvathy, 2009). Pre-existing knowledge is an important part of finding opportunities, without pre-existing knowledge an entrepreneur may miss a big opportunity (Dew, 2009).

*2.1.5 View of the future: Controlling the unpredictable future vs. predicting the uncertain future*

Causation focuses on the predictable aspects of an uncertain future. This can be defined as follows: “*To the extent that we can predict the future, we can control it*”. Effectuation focuses on controlling the unpredictable future. This can be described as follows: “*To the extent that we can control the future, we do not need to predict it*” (Sarasvathy, 2009, p.91). If entrepreneurs experience a great level of uncertainty, an effectual logic is more likely to emerge, although uncertainty of entrepreneurs has so far been rarely tested (Perry et al., 2012).

**Sub-constructs of Effectuation and Causation**

	<b>Causation</b>	<b>Effectuation</b>
Taking actions	Goals	Means
Risk and resources	Expected return	Affordable loss
Attitude towards others	Competitive analysis	Commitments
Attitude towards unexpected events	Pre-existing knowledge	Exploiting contingencies
View of the future	Predicting the uncertain future	Controlling the unpredictable future

*Table 2: Sub-constructs Causation and Effectuation (Sarasvathy, 2009)*

**2.2 Cultural tightness-looseness**

Entrepreneurs are influenced by the culture in which they operate. Important individual beliefs are affected by the national culture, which determine whether an entrepreneur will succeed in creating a successful venture (Hopp & Stephan, 2012). The behaviour of an entrepreneur and his individual goals are determined by cultural norms (Hayton et al. 2002). Myers and Tan (2002) mention that it is important to understand cultural differences, finding one perfect concept of ‘national culture’ is not possible. To adopt a more dynamic view of culture, researches should see a cultural as temporal, emergent and contested.

Research on culture and the best way to measure it has greatly increased in the last decades. With a theoretical and empirical scope, researchers try to explain cultural differences in behaviour (Gelfand et al., 2006). Most of the studies were focusing on values to explain cultural differences (Schwartz, 1994). Using values enabled researchers to understand complex differences between national cultures. Hofstede (1984) defines culture as “*the collective programming of the mind which distinguishes the members of the one group from another*” (p.389). Hofstede (2001) indicates four different layers which describe culture: symbols, heroes, rituals and values. The first

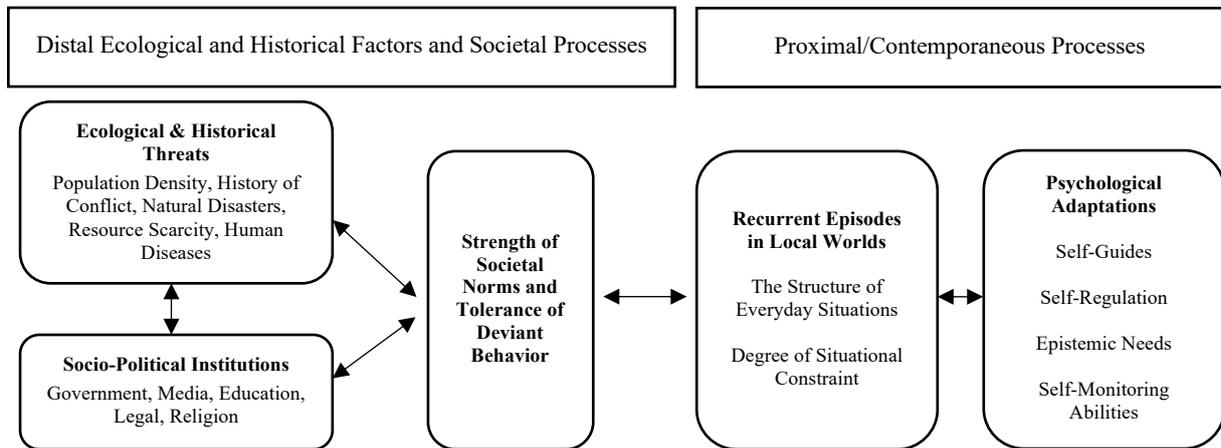


Figure 1: Systems model of cultural Tightness-Looseness (Gelfand et al., 2011, p. 1102)

three layers can be seen as tangible, while values focus on the perspective of an individual and how an individual experiences cultural norms (Hofstede, 2001). Currently, there is a growing criticism about the use of values to measure cultural differences. On empirical grounds, the reliability of understanding a culture by measuring values has been questioned. Values do not always explain the cultural differences. Values reflect a subjectivist bias, culture is reduced to drivers that exist inside the head of an individual (Gelfand et al., 2006).

Pelto (1968) suggests that culture can be measured by tightness and looseness. Tight and loose societies form a continuum, with extreme cases at either end and varying degrees of tightness or looseness in between. By developing this theory, the difference between the Thais and Japanese culture were described. Where the culture of Thailand can be seen as very loose, because of the lack of regularity, discipline and regimentation. This stands in contrast with the Japanese culture, this culture can be described as very tight (Pelto, 1968). A loose culture has unclear norms about social situations and tolerate deviance from the norms. A tight culture has clear norms, little deviation from normative behaviour is tolerated and sanctions are administered to people who deviate (Triandis, 1989; Carpenter, 2000).

Gelfand et al. (2011) developed a multilevel system for the two cultural dimensions, as shown in figure 1. This multilevel system comprises distal historical and ecological threat,

think of resource scarcity, environmental threats and high population density. Broad versus narrow societal institutions, think of media regulations and autocracy. The strength of events that occur every day, like need for structure and high regulatory strength. According to Gelfand et al. (2006), an internal focus on cultural differences leaves out external influence, such as social networks and cultural norms. Only focussing on internal values, will ensure that there is no clear picture of a culture and remains unexplained. The dimensions of cultural tightness-looseness are not affected by subjectivist bias and have shown promises. It is a reliable way to measure a national culture (Aktas, Gelfand, & Hanges, 2016).

### 2.3 Uncertainty

The effect of many different antecedents on the decision-making process of entrepreneurs has already been studied. Think of type of firm (Berends, Jelinek, Reymen, & Stultiëns, 2014; Mthanti & Urban, 2014), cognition (Mitchell et al., 2007), venture performance (Read, Song, & Smit, 2009) and innovation (Svensrud & Åsvoll, 2012; Lingelbach, Sriram, Mersha, & Saffu, 2015). Many studies struggle to control environmental factors like uncertainty, which influence the decision-making process of entrepreneurs (Sarasvathy, 2009; Arend et al. 2015).

Uncertainty influences the choices people make. It is important to understand the choices that people make under uncertainty. Because choices are made on the basis of uncertainty at

every social level. Think for example of choosing the best insurance or choosing the most reliable supplier. The choices can vary widely in the level of information the decision maker has about the outcome opportunities (Hsu, Bhatt, Adolphs, Tranel & Camerer, 2005). If people make the wrong choices, they will regret it afterwards. The person who made this decision, is prepared to trade-off financial return in order to avoid regret (Bell, 1982). Uncertain people assess the value of the result using reference points, think of foregone assets, prior expectations and status quo (Bell, 1985).

As a firm, there are two ways to deal with uncertain situation: adaptive approaches and planning approaches. Predicting plays a major role in making choices. Predicting is a central subject in strategy formation, because of the assumption that what can be predicted, can be controlled (Wiltbank, Dew, Read, & Sarasvathy, 2006).

Individuals normally try to avoid uncertainty; they prefer known situations over unknown or uncertain situations. Predictable environments stimulate a causal decision-making process, while uncertain environments ensure an effectuation approach (Sarasvathy, 2001a). Uncertainty of an entrepreneur can be reduced by co-creator alliances and stakeholder who can provide new information, this results in the environment in which the entrepreneur operates becoming more certain and therefore uncertainty decreases (Arend et al., 2015). If entrepreneurs experience environmental uncertainty, flexibility in their business planning seems to be important (Alvarez & Barney, 2005).

## 2.4 Hypotheses

The theoretical concepts of causation, effectuation, cultural tightness-looseness and uncertainty are defined. Now a number of hypotheses have been developed to test the relationships between these variables. tested variables and table 4 shows an overview of the hypotheses that will be tested.

### 2.4.1 Proposed effect of culture on the decision-making process of an entrepreneur

Various studies have shown that culture influences people's choices. Societal tightness and looseness have two key components: the strength of sanctioning and the strength of norms (Gelfand et al., 2006). A tight culture has a low tolerance of deviant behaviour and many strong norms, while a loose culture has high tolerance of deviant behaviour and weak social norms (Gelfand et al., 2011). A loose culture is expected to be individualistic and complex and a tight culture is expected to be collectively oriented (Triandis, 2018). Sarasvathy (2001a) argues that in unpredictable environments, entrepreneurs tend to use an effectuation approach. In more stable environments, a causation approach is more common. In a loose society, there is less order and formality, this may enhance the freedom of an entrepreneur and a less planned approach than in a tight society with many formal rules and regulations. Therefore, it is expected that a tight perceived culture has a positive effect on the causation approach in the decision-making process of entrepreneurs.

*H1<sub>a</sub>: Entrepreneurs who perceive their culture as tight, prefer the usage of a causation approach in the decision-making process*

A loose culture has a general lack of formality, order, and discipline and a high tolerance for deviant behaviour (Gelfand et al., 2006). A loose culture can be seen an unstable environment. In these environments, entrepreneurs prefer an effectuation approach (Sarasvathy, 2001a). In a tight perceived culture, a causation approach fits better. The end needs to be defined before entrepreneurs start to make decisions. Therefore, it is expected that a tight perceived culture has a negative effect on the usage of effectuation in the decision-making process.

*H1<sub>b</sub>: Entrepreneurs who perceive their culture as tight, opposed to the usage of an effectuation approach in the decision-making process*

#### **2.4.2 Proposed effect of Culture on uncertainty**

Individuals try to avoid uncertain situations (Sarasvathy, 2001a). The cultural looseness-tightness may affect the uncertainty of an entrepreneur. In tight cultures, there are many expectations of every individual and norms are stringently enforced and explicit (Carpenter, 2000). In cultures where there is a close connection between everyday situations and the chronic psychological processes of individuals. Individuals will experience that their behavioural options are limited (Gelfand et al., 2011). In a loose culture, entrepreneurs may feel looser to make their own decisions and they will be more confident than in a tight perceived culture. In a tight culture, entrepreneurs may feel social pressure making them more uncertain. Therefore, it is expected that a tight perceived culture has a positive effect on the level of uncertainty of an entrepreneur.

*H2: Entrepreneurs who perceive their culture as tight will experience a higher level of uncertainty*

#### **2.4.3 Proposed effect of uncertainty on the decision-making process of an entrepreneur**

Uncertain people try to avoid uncertain situations. In the causation process, an entrepreneur tries to predict aspects which they can influence in times of uncertainty (Sarasvathy, 2001a). A study of McGregor et al. (2001) shows that people who experience uncertainty prefer to set specific personal goals and are more planned in making decisions. Therefore, it is expected that entrepreneurs who have a high level of uncertain, prefer the usage of a causation approach.

*H3<sub>a</sub>: Entrepreneurs with a high level of uncertainty, prefer the usage of a causation approach in the decision-making process*

Entrepreneurs who experience a low level of uncertainty will feel more confident about themselves and their choices. Confident people

do not make specific goals because of their high level of confidence. They believe they are able to face every threat (Sieck & Yates, 1997). This fits well in the effectuation approach. Therefore, it is expected that entrepreneurs with a low amount of uncertainty prefer the usage of effectuation in the decision-making process.

*H3<sub>b</sub>: Entrepreneurs with a low level of uncertainty, prefer the usage of effectuation in the decision-making process*

#### **2.4.4 Proposed moderation effect of uncertainty on the relationship between cultural looseness and the use of an effectuation or causation decision-making process**

Culture influences the psychological processes of an individual. Gelfand et al. (2011) mentions different several psychological processes (self-regulation strength, need for order, self-monitoring, prevention focus) that influence an individual. Self-regulation (Baumeister & Heatherton, 1996), prevention focus (Halamish, Liberman, Higgins, & Idson 2008; Hmieleski & Baron, 2008) and self-monitoring (Gudykunst et al., 1992) influence the amount of uncertainty of an entrepreneur.

The expected correlation between culture and decision-making process of an entrepreneur may be influenced by uncertainty. Uncertain people try to avoid unknown and uncertain situations (Sarasvathy, 2001a). A loose culture can be described as an uncertain environment where it is hard to predict the future. The amount of uncertainty of an entrepreneur may influence the relationship between cultural looseness-tightness and the decision-making process of an entrepreneur. An entrepreneur may experience the South African culture as tight and therefore use a causation approach, but because of his high amount of personal uncertainty, the entrepreneur may choose an effectuation approach. Therefore, it is expected that uncertainty acts as a moderation effect for the relationship between cultural tightness and the decision-making process.

**H4<sub>a</sub>:** *Uncertainty acts as a moderation effect for the relationship between cultural tightness and the use of causation in the decision-making process*

**H4<sub>b</sub>:** *Uncertainty acts as a moderation effect for the relationship between cultural tightness and the use of effectuation in the decision-making process*

### Hypotheses overview

H1 <sub>a</sub>	<i>Entrepreneurs who perceive their culture as tight, prefer the usage of a causation approach in the decision-making process</i>
H1 <sub>b</sub>	<i>Entrepreneurs who perceive their culture as tight, opposed to the usage of an effectuation approach in the decision-making process</i>
H2	<i>Entrepreneurs who perceive their culture as tight will experience a higher level of uncertainty</i>
H3 <sub>a</sub>	<i>Entrepreneurs with a high level of uncertainty, prefer the usage of a causation approach in the decision-making process</i>
H3 <sub>b</sub>	<i>Entrepreneurs with a low level of uncertainty, prefer the usage of effectuation in the decision-making process</i>
H4 <sub>a</sub>	<i>Uncertainty acts as a moderation effect for the relationship between cultural tightness and the decision-making process</i>
H4 <sub>b</sub>	<i>Uncertainty acts as a moderation effect for the relationship between cultural tightness and the decision-making process</i>

Table 3: Hypotheses overview

## 3. Methodology

This chapter will explain the research method. What conditions the sample should meet and

how they were collected. How the survey questions are measured and how they should be interpreted. The way of data analysis and the use of control variables is also written in this chapter.

### 3.1 Sample

This data collection took place in South Africa. South Africa is a member of the BRICS since 2010. These countries (Brazil, Russia, India, China and South Africa) are all fast-growing economies with a lot of entrepreneurial activities (Cowan, Chang, Inglesi-Lotz, & Gupta, 2014). The South African government has recognised the importance of entrepreneurship in the economic development and social upliftment of the nation. And to reduce the economic uncertainty of the country (Nicolaidis, 2011). Therefore, it is interesting to collect data of entrepreneurs in South Africa. To see the possible effect of an uncertain economy and the growth in entrepreneurial activities.

In order to conduct this research, entrepreneurs were asked to fill out an online survey. These entrepreneurs should all operate in South Africa. Mails have been sent to incubator programs, start-ups and universities to get in touch with entrepreneurs. By sending e-mails, a network of people was built up who wanted to help with this research, in various ways. Many entrepreneurs who filled out the survey, were met in person. Some of the entrepreneurs are still busy with their bachelor's or master's degree. Students who are busy setting up a business are also seen as entrepreneurs, as they are in the middle of the process. Student entrepreneurs can be seen as a representative group to study (Mueller & Thomas, 2001). The initial effectuation approach based on expert entrepreneurs showed the usage of effectuation by expert entrepreneurs (Dew et al., 2008). This research is focussing on experienced and unexperienced entrepreneurs, to test the linkage between experience and the use of causation. And this research makes it a suitable comparison group to test the robustness (Arend et al., 2015). Experience is measured by years

## Descriptive Statistics of the sample

	Mean	SD	Categories	Frequency	Percentage
<b>Age</b>	34.71	10.67			
<b>Gender</b>			Male	174	75,7%
			Female	56	24,3%
<b>Nationality</b>			South African	194	84,3%
			Foreign	36	15,7%
<b>Level of degree</b>	3.17	1.38	High school	35	15,2%
			Community college	22	9,6%
			Bachelor's degree	107	46,5%
			Honours degree	8	3,5%
			Master's degree	50	21,7%
			Doctorate degree	8	3,5%
<b>Study background</b>			Technical	71	30,9%
			Non-technical	159	69,1%
<b>Ventures founded</b>	2.11	1.06	1 venture	83	36,1%
			2 ventures	73	31,7%
			3 ventures	39	17,0%
			4 or more venture	35	15,2%
<b>Experience in entrepreneurship</b>	7.43	7.59	0-2 years	50	21,7%
			3-5 years	89	38,7%
			6-10 years	46	20,0%
			11 or more years	45	19,6%
<b>Employees</b>	3.08	1.35	1 employee	33	14,3%
			2 employees	41	17,8%
			3-5 employees	80	34,8%
			6-10 employees	38	16,5%
			11-49 employees	28	12,2%
			50-249 employees	9	3,9%
			250 or more employees	1	0,4%
<b>Type of industry</b>			Primary and secondary industry	97	42,2%
			Tertiary industry	133	57,8%
<b>Objective of the firm</b>			Profit and growth	167	72,6%
			To sustain myself	36	15,7%
			Non-profit and socially responsible	27	11,7%

Table 4: Descriptive Statistics Dataset

not by the amount of ventures. Entrepreneurs in South Africa prefer to start more ventures because of the high failure rate of a business (Landzani & Van Vuuren, 2002).

The total sample size consists of 230 entrepreneurs in South Africa. This sample consists of unexperienced and experienced

entrepreneurs of all ages who are working in different sectors. To measure the perceived cultural tightness, also foreign entrepreneurs have been included. In order to get a good overall picture of how entrepreneurs, regardless of their nationality, experience the culture in which they operate, it is interesting to take all entrepreneurs with them. A large part of the

South African economy depends on foreign entrepreneurs. The government encourages the arrival of foreign entrepreneurs who cooperate with local entrepreneurs (Akinboade & Braimoh, 2010). An individual will identify a local culture more strongly than a foreign culture (Chiu & Cheng, 2007). This will give a reliable overview of entrepreneurship in South Africa and give more insights about the decision-making process of entrepreneurs.

### 3.2 Sampling methods

This research is testing different scales, the combination of these different scales helps to answer the research question. The questions in the questionnaire are all tested and can be considered as valid and reliable, because these questions are found in literature. Table 4 describes the dataset that is used to test the hypothesis. The sample consists of 174 male entrepreneurs and 56 female entrepreneurs. Over 84% of the sample are South African entrepreneurs. The age ranges from 18 till 74 with a mean of 34.71. Most of the entrepreneurs have a non-technical study background (69,1%). The sample consists mostly of high educated entrepreneurs, 173 entrepreneurs have a bachelor's degree or higher. The average experience of entrepreneurs is 7.43 years and 147 entrepreneurs have founded at least two ventures.

Also, Clausen and Solvoll (2014) conducted a 10-item questionnaire to measure effectuation and causation (appendix A). Five questions measure the principles of effectuation while the other five measure the principles of causation. The measurement of effectuation and causation will be done by a 7-point-Likert scale, where '1' means 'totally disagree' and '7' means 'totally agree'. A 7-point-Likert has been conducted to not force entrepreneurs to choose a side.

Carleton, Norton and Asmundson (2007) conducted a 12-item questionnaire to measure uncertainty (appendix C). A 7-item subscale of prospective intolerance of uncertainty and a 5-item subscale of inhibitory intolerance of

uncertainty were conducted. Despite the fact that two factors are described in the article, uncertainty will be measured as one variable. Recent research has cast doubt about the separability of the different factors. The full model provided strong evidence of a general intolerance of uncertainty factor, which is more reliable than either subscale factors and account for a more significant common variance (Hale et al., 2016). Using the general factor score is recommended in clinical research and assessment (Lauriola, Mosca, & Carleton, 2016). The multidimensionality of the 12-item questionnaire does not appear to be substantive. The questionnaire can be regarded as a unidimensional representation of intolerance of uncertainty (Shihata, McEvoy, & Mullan, 2018). Therefore, this variable will be treated as one factor without subscales.

The measurement of uncertainty will be measured by a 5-point-Likert scale, where '1' means 'not all characteristic of me' and 5 means 'entirely characteristic of me'. A high score in this 12-item questionnaire means that an entrepreneur can be seen as uncertain.

Gelfand et al. (2006) conducted a 6-item questionnaire to measure cultural looseness-tightness (appendix B). The measurement of cultural looseness-tightness will be measured by a 6-point-Likert scale, where '1' means 'strongly disagree' and '6' means 'strongly agree'. A high average score on this 6-item questionnaire means that entrepreneurs perceive their culture as tight, a low average score indicates a loose culture.

### 3.3 Methods of analysis

The results of the filled in questionnaires will be analysed in IBM SPSS Statistics Database version 25, to test the proposed hypotheses. The data can be measured easily and reliably by using point-Likert scale. The main goal is to get more insights in the influence of cultural tightness-looseness on the decision-making process of an entrepreneur and the influence of uncertainty on this possible relationship. To

achieve this, all the filled in questionnaires will be merged to one dataset. The dataset will be tested by different methods. The interval between the answers are equally distributed, the gap between for example answer '2' and '3' is the same as the gap between '4' and '5'.

To get a better understanding of the influence of culture and uncertainty on the decision-making process of an entrepreneur, it is important that the dataset is reliable. Several tests can measure the reliability of the sample. The Cronbach's Alpha measures reliability of the scales, a score of 1 means that the items completely correlate with each other, a score of 0 means there is no correlation between the different questions of an item. A score of .70 or higher is considered reliable and at least .60 to be acceptable and a score of .50 can be seen as poor (Field, 2013). The normality of the sample should also be tested. The Shapiro-Wilk and Kolmogorov-Smirnov are reliable ways to test the normality of a sample. The Shapiro-Wilk test fits better if the sample size is small (Field, 2013). A significance value ( $p < .05$ ) indicates a deviation in the normal distribution. If the outcome of the Shapiro-Wilk test shows that the dataset is not normal distributed, the skewness can be tested. A skewness between -1. and 1. makes it still acceptable to work with the data (Joh & Malaiya, 2014). The Kaiser-Meyer-Olkin Measure of Sampling Adequacy give in the reliability of factor analysis. A KMO-score above .60 indicates that the data is useful for factor analyses (Field, 2013). The Barlett's test of sphericity tests the hypothesis that the correlation matrix is an identity matrix. If the score is above  $p > .05$ , a factor analysis may not be useful for the dataset (Field, 2013).

To test the hypotheses, a hierarchical multiple regression will be conducted. Before testing, four assumptions should be met. Four assumptions will be tested before the hypotheses are tested: 1) the variables should be normally distributed 2) there is a linear relationship between the independent and depend variables 3) reliability and simple

regression 4) assumption of homoscedasticity (Osborne & Waters, 2002).

### 3.4 Control variables

Control variables are an experimental element which is unchanged and constant through the research. These variables could influence the results of a test. This research uses in addition to the variables culture, uncertainty, effectuation and causation some control variables. *Gender* will be tested if there is a difference between men and women, *nationality* will be tested to see the differences between nationalities. *Educational background* will be tested to see the differences between education levels. *Type of study* will be tested to see differences between different type of backgrounds. *Amount of ventures founded*, to test differences between different amount of founded ventures. *Years of experience*, to test differences between the amount of experience as an entrepreneur. *Number of employees*, to test if there are differences between entrepreneurs who own a small firm and a large firm. *Firm industry type* to see differences between entrepreneurs who are having different type of firms. *Objective of the venture* is the last control variables, to test if there are differences between entrepreneurs who started their business for profit and growth, to sustain themselves or a non-profit venture with socially responsible objectives.

## 4. Results

This chapter will measure the reliability of the sample, analyse the descriptive statistics and test the relationships between variables and control variables and the previously mentioned hypotheses.

### 4.1 Scale validation

In appendix D, the correlation between the questions of a variable has been tested. All questions are significant correlated except the fourth question of the 6-item scale of Gelfand et al. (2006). This is a reversed question, what might be the cause. The 12-item of Carleton et

al. (2007) are all significant correlated with each other. In the 10-item scale of Alsos et al. (2014) question three of causation is not significant correlated with the other questions. The Cronbach's Alpha measures reliability of the scales, where a score of .70 or higher is considered reliable and at least .60 to be acceptable (Field, 2013). A score between .50 and .60 can be described as poor (Gliem & Gliem, 2003). Appendix D shows the Cronbach's Alpha of all variables. The scale of causation ( $\alpha = .567$ ) does not fit in the minimum score of .70 or higher. The scales of effectuation ( $\alpha = .805$ ), culture ( $\alpha = .711$ ) and uncertainty ( $\alpha = .882$ ) score all above the .70 which makes them reliable. A corrected inter-item correlation mean of a question should be between .90 and .20, if a Cronbach's Alpha of an item is below .60, it can still be useful if the inter-item mean is between these numbers (Sijtsma, 2009). The corrected item-total correlation of causation question three gives a score of .135, this indicates that this item may not belong in this item. However, the fact that this variable is previously tested, this research will keep the variable components as they are conducted.

The tests of normality (appendix E) showed significance values ( $p < .05$ ) for causation ( $SW = .98, p = .002$ ), effectuation ( $SW = .98, p = .008$ ) and uncertainty ( $SW = .98, p = .001$ ). This indicates a deviation in the distribution. Only culture ( $SW = .99, p = .59$ ) shows a normal distribution according to the Shapiro-Wilk test. Testing the variables who showed a deviation in distribution were tested on skewness. A score between -1. and 1. still referring to a normal distribution. Causation (skewness =  $-.507, SE = .16$ ), effectuation (skewness =  $.229, SE = .16$ ) and uncertainty (skewness =  $.445, SE = .16$ ) all scored between -1. and 1. So, the dataset is referring to a normal distribution.

To test the usefulness of a factor analysis, a Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's test of sphericity (appendix F) were carried out to measure this. The KMO-score of causation (.677),

effectuation (.776), uncertainty (.888) and culture (.757) all met the threshold of .60. The Bartlett's test of sphericity for causation ( $df 10 = 119, p < .001$ ), effectuation ( $df 10 = 354, p < .001$ ), uncertainty ( $df 66 = 1176, p < .001$ ) and culture ( $df 15 = 323, p < .001$ ) all show an acceptable p-value below .05, which makes the data useful for factor analysis.

The 10-item questionnaire by Alsos et al., (2014) consists of two components; causation and effectuation. To test if the questions fit with the components, an explanatory factor analysis has been conducted (appendix G). This factor analysis showed that the question of causation all fit in the component of causation and the same for effectuation. To test all the variables, the outcomes showed seven components. Showing to many factors often occurs component analysis (Lance, Butts, & Michels, 2006). A parallel is another reliable way to test the factors. The outcomes of the rotated component matrix (appendix G) show that most items fit with the variables of causation, effectuation, uncertainty and culture. Only two questions of uncertainty score high on causation. For testing the perceived cultural tightness, a mahalanobis test has been conducted to test if there are outliers in the perceived tightness. The outcome shows no outliers, so the data can be used as a whole (appendix H).

For the use of a hierarchical multiple regression, there should be a linear relationship between the independent and dependent variables. Appendix H show that all the independent and dependent variables have a linear relationship. The Durbin-Watson statistic is a test for autocorrelation in het residuals. To see if the data is independent, the Durbin-Watson should be between 1.5 and 2.5 (Garson, 2012). The outcomes of the test show that all variables fit in this rule of thumb. To test if the dataset has some outliers, boxplots were made. The upper- and lower bound show the maximum score for outliers. Since the multiplier of 1.5 sometimes show unnecessary outliers, a multiplier of 2.2 is

advised (Hoaglin & Iglewicz, 1987). All the variables show no outliers if the multiplier of 2.2 is calculated. The variance inflation factor (VIF) in appendix H shows no multicollinearity in the items. As rule of thumb, the VIF value should not exceed the score of 5 (Hair, Ringle, & Sarstedt, 2011).

#### 4.2 Descriptive statistics

Table 5 shows the descriptive statistics of the scales. The range, mean and standard deviation are shown. The results of the descriptive statistics show that the causation approach (mean = 5.05, SD = 0.89) scores remarkably higher on average than the effectuation approach (mean = 3.86, SD = 1.4). Both variables still score above the average based of the 7-point-Likert. The respondents seem to prefer expected returns (mean = 5.17, SD = 1.65) over affordable loss (mean = 4.54, SD = 1.77). Pre-existing knowledge (mean = 3.8, SD = 1.69) scores much lower on average than the other questions focusing on the causation process, exploiting contingencies (mean = 4.31, SD = 1.81) shows a tendency that entrepreneurs prefer that over pre-existing knowledge. Furthermore, a tendency to focus on competitive analysis (mean = 5.58, SD = 1.36), rather than to focus on commitments (mean = 3.67, SD = 1.85). The last item shows a tendency that entrepreneurs prefer predicting the uncertain future (mean = 5.08, SD = 1.4) rather than controlling the unpredictable future (mean = 3.33, SD = 1.92). The mean scores show that entrepreneurs prefer causation over effectuation, except for the sub-construct pre-existing knowledge and exploiting contingencies. The score of culture (mean = 3.63, SD = 0.87) is above average, with a 6-point-Likert. The questions: ‘There are many social norms that people are supposed to abide by in this country’ (mean = 4.2, SD = 1.34) and ‘In this country, if someone acts in an inappropriate way, others will strongly disapprove’ (mean = 4.03, SD = 1.85) both have an average above 4. The question: ‘People in this country have a great deal of freedom in deciding how they want to behave in most

### Descriptive Statistics

	Minimum	Maximum	Mean	SD
<b>Causation</b>	2,00	7,00	5,08	0,89
Goal-oriented	1	7	5,75	1,24
Expected returns	1	7	5,17	1,65
Pre-existing knowledge	1	7	3,80	1,69
Competitive analysis	1	7	5,58	1,36
Uncertain future	1	7	5,08	1,40
<b>Effectuation</b>	1,00	7,00	3,86	1,40
Means-oriented	1	7	3,46	2,00
Affordable loss	1	7	4,54	1,77
Contingencies	1	7	4,31	1,81
Commitments	1	7	3,67	1,85
Unpredictable future	1	7	3,33	1,92
<b>Culture</b>	1,00	6,00	3,63	0,87
Social norms	1	6	4,20	1,34
Expectations	1	6	3,77	1,41
Appropriate behaviour	1	6	3,69	1,39
Freedom	1	6	2,79	1,35
Acting inappropriately	1	6	4,03	1,31
Comply with norms	1	6	3,31	1,34
<b>Uncertainty</b>	1,00	4,67	2,56	0,76
Unforeseen events	1	5	2,41	1,07
Not having information	1	5	3,24	1,16
Avoid surprises	1	5	3,89	0,90
Unforeseen events	1	5	2,46	1,22
Know the future	1	5	3,04	1,30
Taken by surprise	1	5	2,43	1,12
Organize in advance	1	5	3,19	1,25
Living with uncertainty	1	5	2,32	1,28
Uncertainty paralyses	1	5	1,81	1,08
Functioning	1	5	2,10	1,13
Doubt	1	5	1,82	1,00
Uncertain situations	1	5	2,02	1,22

Table 5: Overview of the descriptive statistics of the variables

situations’ (mean = 2.79, SD = 1.35) scores remarkably lower than the other question, this was a reversed question. Overall, the culture of South Africa can be described as rather tight than loose.

The 12-item scale of uncertainty (mean = 2.56, SD = 0.76) scores very slightly above average

on a 5-point-Likert. The question: ‘One should always look ahead so as to avoid surprises’ (mean = 3.89, SD = 0.9) scores notable higher than average. The questions: ‘Uncertainty keeps me from living a full life’ (mean = 1.81, SD = 1.08) and ‘The smallest doubt can stop me from acting’ (mean = 1.82, SD = 1) score notable lower than average. Overall, the uncertainty of an entrepreneur is on average not very low nor very high.

### 4.3 Correlations

Table 7 shows an overview of the correlations between the control-, independent-, and dependent variables. Cultural tightness shows a positive and statistically significant correlation with causation (R = .181, p < .01) and uncertainty (R = .203, p < .01). Uncertainty shows a positive and statistically significant correlation with causation (R = .135, p < .05). Effectuation shows a negative and statistically significant correlation with causation (R = -.280, p < .05). The control variables show a negative and statically significant correlation between effectuation and level of degree (R = -.130, p < .05). Uncertainty is also negative and statically significant correlated with the level of

degree (R = -.207, p < .01). Effectuation is positive and statically significant correlated with gender (R = .149, p < .05) and the objective of the firm (R = .223, p < .01). Causation is negative and statically significant correlated the objective of the firm (R = -.224, p < .01) and causation is positively and significantly correlated with the number of employees (R = .188, p < .01).

### 4.4 Hypotheses testing

Table 7,8,9 and 10 show the outcomes of the hierarchical multiple regression analysis. Table 11 gives an overview of the tested hypotheses.

*H1a: Entrepreneurs who perceive their culture as tight, prefer the usage of a causation approach in the decision-making process*

A hierarchical multiple regression analysis focusing on causation, showed a statistically significant relationship in model 1 consisting of control variables on causation (R<sup>2</sup>= .105, F (10, 219) = 2,573, p = .006, adjusted R<sup>2</sup>= .064). The correlation matrix with all the independent variables shows that the predictors objective (beta = -.224, p = .001) and employees (beta =

### Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13
<b>Control variables</b>													
1 Age													
2 Gender	<b>,154*</b>												
3 Nationality	0,06	0,034											
4 Degree	-0,028	-0,064	<b>,146*</b>										
5 Study	-0,015	<b>,182**</b>	0,003	<b>-,148*</b>									
6 Ventures	<b>,265**</b>	<b>-,146*</b>	0,033	-0,034	0,053								
7 Experience	<b>,697**</b>	0	0,031	-0,057	0,024	<b>,568**</b>							
8 Employees	<b>,176**</b>	-0,108	0,055	0,129	0,046	<b>,352**</b>	<b>,276**</b>						
9 Industry	<b>-,196**</b>	0,004	<b>,139*</b>	<b>,131*</b>	<b>,216**</b>	-0,007	-0,110	0,025					
10 Objective	0,066	<b>,193**</b>	0,12	0,002	-0,03	-0,043	0,07	-0,042	-0,078				
<b>Variables</b>													
11 Culture	-0,09	0,014	0,056	0,003	<b>,143*</b>	-0,029	-0,044	0,04	0,034	-0,094			
12 Uncertainty	0,059	0,067	0,022	<b>-,207**</b>	<b>,201**</b>	-0,12	0,004	-0,085	-0,054	-0,053	<b>,203**</b>		
13 Causation	0,097	-0,064	0,017	0,123	0,019	0,03	0,071	<b>,188**</b>	0,028	<b>-,224**</b>	<b>,181**</b>	<b>,135*</b>	
14 Effectuation	-0,071	<b>,149*</b>	0,1	<b>-,130*</b>	0,042	-0,111	-0,048	<b>-,275**</b>	0,005	<b>,223**</b>	-0,02	0,122	<b>-,280**</b>

Table 6: Overview of correlations. Note. N=230. \* p < .05; \*\*p < .01

,164,  $p = .020$ ) have a significant effect on the dependent variable. The full model with the perceived cultural tightness added, shows still a statistically significant relationship ( $R^2 = .131$ ,  $F(1, 218) = 2,978$ ,  $p = .012$ , adjusted  $R^2 = .087$ ) and perceived tightness ( $\beta = .164$ ,  $p = .012$ ) has a significant effect on the dependent variable. An entrepreneur who is perceiving the national culture as tight, will prefer the usage of a causation approach.

To conclude, there is a clear direction towards the perceived cultural tightness and the use of causation in the decision-making process. Additionally, the control variables ‘objective’ shows a significant negative effect and ‘employees’ shows a significant positive effect on the use of causation.

**H1<sub>b</sub>:** *Entrepreneurs who perceive their culture as tight, opposed to the usage of an effectuation approach in the decision-making process*

A hierarchical multiple regression analysis focusing on effectuation, showed a statistically

control variables on effectuation ( $R^2 = .155$ ,  $F(10, 219) = 4,013$ ,  $p = .000$ , adjusted  $R^2 = .116$ ). The correlation matrix with all the control variables shows that the predictors objective ( $\beta = .183$ ,  $p = .005$ ) and employees ( $\beta = -.245$ ,  $p = .000$ ) have significant effect on the dependent variable. The full model with the perceived cultural tightness added, shows no statistically significant relationship between the perceived cultural tightness and the use of effectuation ( $R^2 = .155$ ,  $F(1, 218) = 3,635$ ,  $p = .848$ , adjusted  $R^2 = .112$ ).

To conclude, there is no clear direction towards the perceived cultural tightness and the use of effectuation in the decision-making process. Additionally, the control variable ‘objective’ shows a significant positive effect and ‘employees’ shows a significant negative effect on the use of effectuation.

	Causation (H1a)				Effectuation (H1b)			
	Model 1		Model 2		Model 1		Model 2	
	$\beta$	Sig.	$\beta$	Sig.	$\beta$	Sig.	$\beta$	Sig.
<b>Control variables</b>								
Age	.093	.330			-.126	.173		
Gender	-.028	.681			.086	.200		
Nationality	.016	.806			.109	.092		
Degree	.103	.126			-.105	.108		
Study	.028	.677			.024	.718		
Ventures	-.082	.327			-.041	.611		
Experience	.029	.787			.109	.300		
Employees	<b>.164</b>	<b>.020*</b>			<b>-.245</b>	<b>.000**</b>		
Industry	.007	.924			.006	.931		
Objective	<b>-.224</b>	<b>.001**</b>			<b>.183</b>	<b>.005**</b>		
<b>Independent variable</b>								
Cultural tightness			<b>0.164</b>	<b>.012*</b>			-.012	.848
<b>Model summary</b>								
$R^2$	.105		.131		.155		.155	
F	2.573		2.978		4.013		3.635	
Adjusted $R^2$	.064		.087		.116		.112	

Table 7: Hypotheses H1. \* $p < .05$ ; \*\* $p < .01$

significant relationship in model 1 consisting of

**H2:** *Entrepreneurs who perceive their culture as tight will experience a higher level of uncertainty*

A hierarchical multiple regression analysis focusing on uncertainty, showed a statistically significant relationship in model 1 consisting of control variables on the level of uncertainty ( $R^2 = .114$ ,  $F(10, 219) = 2,807$ ,  $p = .003$ , adjusted  $R^2 = .073$ ). The correlation matrix with all the control variables shows that the predictors degree ( $\beta = -.175$ ,  $p = .009$ ) and study ( $\beta = .200$ ,  $p = .004$ ) have a significant effect on the dependent variable. The full model with the perceived cultural tightness added, shows still a statistically significant relationship ( $R^2 = .144$ ,  $F(1, 218) = 3,345$ ,  $p = .006$ , adjusted  $R^2 = .101$ ) and perceived tightness ( $\beta = .180$ ,  $p = .006$ ) has a significant effect on the dependent variable. An entrepreneur who is perceiving the national culture as tight, will experience a higher level of uncertainty.

To conclude, there is a clear direction towards the perceived cultural tightness and the level of uncertainty of an entrepreneur. Additionally,

the control variable ‘degree’ shows a significant negative effect and ‘study’ shows a significant positive effect on the level of uncertainty

**H3<sub>a</sub>:** *Entrepreneurs with a high level of uncertainty, prefer the usage of a causation approach in the decision-making process*

A hierarchical multiple regression analysis focusing on causation, showed a statistically significant relationship in model 1 consisting of control variables on causation ( $R^2 = .105$ ,  $F(10, 219) = 2,573$ ,  $p = .006$ , adjusted  $R^2 = .064$ ). The correlation matrix with all the independent variables shows that the predictors objective ( $\beta = -.224$ ,  $p = .001$ ), employees ( $\beta = .164$ ,  $p = .020$ ) have a significant effect on the dependent variable. The full model with the level of uncertainty added, shows a statistically significant relationship between the perceived level of uncertainty and the use of causation ( $R^2 = .127$ ,  $F(1, 218) = 2,884$ ,  $p = .020$ , adjusted  $R^2 = .083$ ).

<b>Uncertainty (H2)</b>				
	<b>Model 1</b>		<b>Model 2</b>	
	$\beta$	Sig.	$\beta$	Sig.
<b>Control variables</b>				
Age	.064	.495		
Gender	-.008	.912		
Nationality	.069	.297		
Degree	<b>-.175</b>	<b>.009**</b>		
Study	<b>.200</b>	<b>.004**</b>		
Ventures	-.174	.037		
Experience	.050	.642		
Employees	-.042	.547		
Industry	-.069	.311		
Objective	-.075	.255		
<b>Independent variable</b>				
Cultural tightness			<b>.180</b>	<b>.006**</b>
<b>Model summary</b>				
R2	.144		.144	
F	2.807		3.345	
Adjusted R2	.073		.101	

Table 8: Hypothesis H2. \* $p < .05$ ; \*\* $p < .01$

To conclude, there is a clear direction towards the perceived cultural tightness and the use of causation in the decision-making process. Additionally, the control variable ‘objective’ shows a significant negative effect and ‘employees’ shows a significant positive effect on the use of causation.

**H3<sub>b</sub>:** *Entrepreneurs with a low level of uncertainty, prefer the usage of effectuation in the decision-making process*

A hierarchical multiple regression analysis focusing on effectuation, showed a statistically significant relationship in model 1 consisting of control variables on effectuation ( $R^2 = .155$ ,  $F(10, 219) = 3,827$ ,  $p = .000$ , adjusted  $R^2 = .116$ ). The correlation matrix with all the independent variables shows that the predictors objective ( $\beta = .183$ ,  $p = .005$ ) and employees ( $\beta = -.245$ ,  $p = .000$ ) have significant effect on the dependent variable. The full model with the perceived level of uncertainty added, shows no statistically significant relationship between the perceived cultural tightness and the use of

effectuation ( $R^2 = .162$ ,  $F(1, 218) = 1,817$ ,  $p = .179$ , adjusted  $R^2 = .120$ ).

To conclude, there is no clear direction towards the perceived cultural tightness and the use of effectuation in the decision-making process. Additionally, the control variable ‘objective’ shows a significant positive effect and ‘employees’ shows a significant negative effect on the use of effectuation.

**H4<sub>a</sub>:** *Uncertainty acts as a moderation effect for the relationship between cultural tightness and the usage of causation in the decision-making process*

A hierarchical multiple regression analysis focusing on causation, showed a statistically significant relationship in model 1 consisting of control variables on causation ( $R^2 = .105$ ,  $F(10, 219) = 2,573$ ,  $p = .006$ , adjusted  $R^2 = .064$ ). The correlation matrix with all the independent variables shows that the predictors objective ( $\beta = -.224$ ,  $p = .001$ ), employees ( $\beta = .164$ ,  $p = .020$ ) have a significant effect on the dependent variable. The full model with the

	Causation (H3a)		Effectuation (H4b)		Causation (H3a)		Effectuation (H4b)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	$\beta$	Sig.	$\beta$	Sig.	$\beta$	Sig.	$\beta$	Sig.
<b>Control variables</b>								
Age	.093	.330			-.126	.173		
Gender	-.028	.681			.086	.200		
Nationality	.016	.806			.109	.092		
Degree	.103	.126			-.105	.108		
Study	.028	.677			.024	.718		
Ventures	-.082	.327			-.041	.611		
Experience	.029	.787			.109	.300		
Employees	<b>.164</b>	<b>.020*</b>			<b>-.245</b>	<b>.000**</b>		
Industry	.007	.924			.006	.931		
Objective	<b>-.224</b>	<b>.001**</b>			<b>.183</b>	<b>.005**</b>		
<b>Independent variable</b>								
Uncertainty			<b>.157</b>	<b>.020*</b>			.089	.179
<b>Model summary</b>								
$R^2$	.105		.127		.155		.62	
F	2.573		2.884		4.013		3.827	
Adjusted $R^2$	.064		.083		.116		.120	

Table 9: Hypotheses H3. \* $p < .05$ ; \*\* $p < .01$

perceived level of uncertainty added as a moderator on the relationship between the perceived tightness and the use of causation, shows no statistically significant relationship ( $R^2 = .146$ ,  $F(1, 218) = 2,834$ ,  $p = .814$ , adjusted  $R^2 = .094$ ).

To conclude, there is a no clear direction towards the moderation effect of uncertainty on the relationship between cultural tightness and the use of causation in the decision-making process. Additionally, the control variable 'objective' shows a significant negative effect and 'employees' shows a significant positive effect on the use of effectuation.

**H4<sub>b</sub>:** *Uncertainty acts as a moderation effect for the relationship between cultural tightness and the usage of effectuation in the decision-making process*

A hierarchical multiple regression analysis focusing on effectuation, showed a statistically significant relationship in model 1 consisting of control variables on effectuation ( $R^2 = .155$ ,  $F(10, 219) = 4,013$ ,  $p = .000$ , adjusted  $R^2 = .116$ ). The correlation matrix with all the independent variables shows that the predictors objective ( $\beta = .183$ ,  $p = .005$ ) and employees ( $\beta = -.245$ ,  $p = .000$ ) have significant effect on the dependent variable. The full model with the perceived level of uncertainty added as a moderator on the relationship between the perceived tightness and the use of effectuation, shows no statistically significant relationship ( $R^2 = .163$ ,  $F(1, 218) = 3,234$ ,  $p = .954$ , adjusted  $R^2 = .113$ ).

To conclude, there is a no clear direction towards the moderation effect of uncertainty on the relationship between cultural tightness and the use of effectuation in the decision-making process. Additionally, the control variable

	Causation (H4a)			Effectuation (H4b)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$
<b>Control variables</b>						
Age	.093			-.126		
Gender	-.028			.086		
Nationality	.016			.109		
Degree	.103			-.105		
Study	.028			.024		
Ventures	-.082			-.041		
Experience	.029			.109		
Employees	<b>.164*</b>			<b>-.245**</b>		
Industry	.007			.006		
Objective	<b>-.224**</b>			<b>.183**</b>		
<b>Independent variable</b>						
Cultural tightness		<b>.140*</b>	<b>.138*</b>		-.029	-.031
Uncertainty		.130	.134		.094	.097
<b>Moderator</b>						
			-.025			-.018
<b>Model summary</b>						
R <sup>2</sup>	.105	.145	.146	.155	.163	.163
F	2.573	3.070	2.834	4.013	3.512	3.234
Adjusted R <sup>2</sup>	.064	.098	.094	.116	.116	.113

Table 10: Hypotheses H4. \* $p < .05$ ; \*\* $p < .01$

‘objective’ shows a significant positive effect and ‘employees’ shows a significant negative effect on the use of effectuation.

	<b>Significance level</b>	<b>Hypotheses</b>
H1 <sub>a</sub>	.012	Accepted
H1 <sub>b</sub>	.848	Rejected
H2	.006	Accepted
H3 <sub>a</sub>	.020	Accepted
H3 <sub>b</sub>	.179	Rejected
H4 <sub>a</sub>	.814	Rejected
H4 <sub>b</sub>	.954	Rejected

Table 10: Overview of the tested hypotheses ( $p < .05$ )

## 5. Conclusion

This study aimed at answering the following research question: *To what extent are entrepreneurial decision-making processes influenced by cultural tightness and uncertainty?*, with causation and effectuation as a way to measure the decision-making process and cultural tightness-looseness as a construct to measure the national culture.

The results show that the South African entrepreneurs prefer a causation approach over an effectuation approach and the national culture can be described as tight. The perceived tightness has a positive significant effect on the causal decision-making process. The level of uncertainty also shows a significant positive effect on the use of causation in the decision-making process. Also, a significant relationship between the perceived cultural tightness and the level of uncertainty of an entrepreneur has been found. An entrepreneur who is experiencing the culture as tight, will experience a higher level of personal uncertainty. Both cultural tightness and uncertainty show no relationship with the use of effectuation. Additionally, this study shows no relationship between experience and the use of causation or effectuation.

This study contributes to the field of entrepreneurship by providing scientific proof of antecedents of the decision-making process of entrepreneurs. Finally, an overall remake can be made. By testing hypotheses focussing on the causation and effectuation process, it can be concluded that entrepreneurs in South African overall prefer a causation approach over an effectuation approach.

## 6. Discussion

Previous studies have shown that the antecedents of the decision process of entrepreneurs can be seen as a complex puzzle. This is one of the reasons that this research has been conducted, to get more insight of the possible antecedents in the decision-making process. We argue that uncertainty and cultural tightness are important antecedents which influence the choices of entrepreneurs. Strong support is found between the relationship of perceived cultural tightness, level of personal uncertainty and the use of causation. On the contrary, there is no proof found that cultural tightness or uncertainty affect the use of effectuation. Besides these antecedents, the control variables which measure the number of employees and the objective of the firm show a strong relationship with both causation and effectuation. The use of effectuation is also influenced by the level of degree and gender.

This research combined novice and experienced entrepreneurs to get insight in the difference of novice and experienced entrepreneurs. To test if there is a relationship between experience and the decision-making process. The outcomes show no relationship between the usage of effectuation by experienced entrepreneurs and causation by novice entrepreneurs. Which contradicts with current literature, where the use of effectuation is linked to expert entrepreneurs and the use of causation to novice entrepreneurs (Dew et al., 2009). The control variables show a relationship between the number of employees and the use of causation and

effectuation. Also, the objective of the firm seems to influence the decision-making process instead of the experience of an entrepreneur.

This study found a relationship between perceived cultural tightness and the use of causation. Which corresponds to the theory of Sarasvathy (2001) where in uncertain environments an effectuation approach is more common. Since the South African national culture can be described as rather tight than loose, the environment can be seen as more certain. Which fits well in the causation approach. Gelfand et al. (2011) claim that in tight perceived cultures individuals may feel more behavioural limits which increase their uncertainty. This study found empirical proof for this statement. There is a relationship between the perceived tightness and the level of personal uncertainty of an entrepreneur. In tight perceived national cultures, entrepreneurs will experience a higher level of personal uncertainty than countries who are perceived as loose. The amount of personal uncertainty also influenced the use of causation. A person who is experiencing a high level of uncertainty prefer the usage of causation. This corresponds with a study of McGregor et al. (2001) which showed that uncertain people prefer to set specific goals and are more planned. The level of uncertainty may also be influenced by both the political and economic instability with which the country is still struggling.

### **6.1 Theoretical contribution**

This study contributes to current literature in several ways. Previous research described a lack of clarity on the antecedents in the decision-making process of entrepreneurs (Arend et al., 2015; Sarasvathy, 2009; Johansson & McKelvie, 2012; Busenitz & Barney, 1997). A lot of research has been done that has only taken place through an effectuation lens and in which only experienced entrepreneurs have been included (Fischer & Reuber, 2011; Read, Song, & Smit, 2009). This research focused on both effectuation and causation, comparing these different ways of a

decision-making process (Arend, Sarooghi, & Burkemper, 2015). The measurement scale of Alsos et al. (2014) was used to validate the usage of causation and effectuation, literature argues that the measurement scale needs to be tested more to increase the reliability. This research increases the reliability and validity of the measurement scale by providing empirical evidence.

The possible antecedents of this research are cultural tightness and uncertainty. Conducting research on the influence of a national culture (Busenitz & Barney, 1997) and uncertainty (Anokhin & Schulze, 2009; Hayton et al., 2002) on the decision-making process will give more insight in the possible antecedents of the decision-making process of entrepreneurs. Current research tested the linkage between national culture and the decision-making process (Stienstra et al., 2012). This research adds more scientific data to support the relationship between culture and the decision-making process.

Many studies struggle to control environmental factors like uncertainty, which influence the decision-making process of entrepreneurs (Sarasvathy, 2009; Arend et al. 2015). This research tested the level of uncertainty and the usage of causation and effectuation to provide empirical evidence in the relationship between uncertainty and the decision-making process. The outcomes showed a tendency of the level of uncertainty and the usage of causation. To test the level of uncertainty, the measurement scale by Carleton et al., (2007) was used. By adding more empirical data, the reliability and validity of the measurement scale as a whole is improved.

Currently, there is a limited amount of research conducted in South Africa focusing on the decision-making process of entrepreneurs (Mthanti & Urban, 2014; Lingelbach, Sriram, & Mersha, 2015; Urban, 2015). By collecting a dataset of 230 entrepreneurs in South Africa, it

is possible to get more insight in the antecedents of the decision-making process.

## 6.2 Practical implication

The collected data may be of interest to many different groups. Entrepreneurs can learn more about the different approaches and which factors influence these choices. It is also interesting to see how other entrepreneurs experience the national culture and how uncertain entrepreneurs are on average. For incubator programs, it is interesting to see how entrepreneurs make their decisions and which factors influence these decisions. For the South African government, it is interesting to see how the entrepreneurs experience the national culture and what the effect is on decisions that entrepreneurs make and the level of uncertainty. Also, the factors that influence the uncertainty of an entrepreneur can be of interest to the government.

## 6.3 Limitations

Some limitation of this study needs to be mentioned, so that future research can take them into account. The Cronbach's Alpha of the variable causation ( $\alpha = .567$ ) scored below .70 which makes the reliability of the item questionable (Field, 2013). The corrected inter-item correlation of causation question three showed a score of .135 which is below the threshold of .20. But a low Cronbach's Alpha does not necessarily mean that the item is not reliable. Coefficient alpha almost always underestimates true reliability, sometimes rather substantially (Sijtsma, 2009; Revelle & Zinbarg, 2009).

The inter-item correlation of the measurement scale of cultural tightness-looseness shows that the reversed question is not significantly correlated to the other items. The mean score of cultural tightness-looseness ( $M = 3,63$ ,  $SD = 0,87$ ) was remarkably higher than the reversed question: 'people in this country have a great deal of freedom in deciding how they want to behave in most situations' in the item of cultural

tightness-looseness ( $M = 2,79$ ,  $SD = 1,35$ ). This item may be wrongly understood by South African entrepreneurs, which affect the reliability.

The overall R-squared scores weakly explain the total variance of effectuation ( $R^2 = .163$ ) and causation ( $R^2 = .146$ ) which indicate that there are some unmeasured antecedents which influence the decision-making process.

## 6.4 Future research

Based on the discussion, theoretical implication and limitations, we propose various possibilities for future research. First, this study found significant relationships between the perceived cultural tightness, uncertainty and the use of causation. The significant relationship between the perceived cultural tightness and the level of uncertainty needs more empirical testing. By adding more cross-country data, the perceived tightness as an antecedent in the decision-making process will provide more robustness and reliability. More data from Western countries can be interesting, to measure the differences and similarities with a fast-growing economy like South Africa.

Secondly, the outcomes of this study show some interesting correlations that require further testing. As previous research described the relationship between experience and the use of causation or effectuation (Dew et al., 2009), this study found no relationship. The outcomes indicate that the number of employees and the objective of the firm influence the choices of entrepreneurs and not their experience. Further studies could measure the effect of these variables on the decision-making process of entrepreneurs.

Thirdly, this study measured uncertainty as an antecedent in the decision-making process. Previous studies described the struggle to get grip on antecedents like uncertainty (Arend et al., 2015). The outcomes of this study are promising, more empirical testing is needed to

test the robustness and reliability of uncertainty as an antecedent.

Finally, the current antecedents that were measured in this study do not seem to explain the whole complexity in the decision-making

process. By adding more possible antecedents, the complex puzzle of antecedents can be gradually unravelled. And will provide a deeper understanding of how entrepreneurs make their decisions.

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## 8. Appendix

### Appendix A: Measurement scale of causation and effectuation

#### Measurement scale by Alsos et al. (2014)

##### Causation measurement scale

1. Goal-oriented
2. Expected returns
3. Pre-existing knowledge
4. Competitive analysis
5. Uncertain future

##### Effectuation measurement scale

1. Means-oriented
2. Affordable loss
3. Contingencies
4. Commitments
5. Unpredictable future

### Appendix B: Measurement scale of culture

#### Measurement scale of uncertainty by Carleton et al. (2007)

1. Unforeseen events upset me greatly
2. It frustrates me not having all the information I need
3. One should always look ahead so as to avoid surprises
4. A small, unforeseen event can spoil everything, even with the best of planning
5. I always want to know what the future has in store for me
6. I can't stand being taken by surprise
7. I should be able to organize everything in advance
8. Uncertainty keeps me from living a full life
9. When it's time to act, uncertainty paralyzes me
10. When I am uncertain, I can't function very well
11. The smallest doubt can stop me from acting
12. I must get away from all uncertain situations

## **Appendix C: Measurement scale of uncertainty**

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### **Measurement scale of uncertainty by Carleton et al. (2007)**

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1. Unforeseen events upset me greatly
  2. It frustrates me not having all the information I need
  3. One should always look ahead so as to avoid surprises
  4. A small, unforeseen event can spoil everything, even with the best of planning
  5. I always want to know what the future has in store for me
  6. I can't stand being taken by surprise
  7. I should be able to organize everything in advance
  8. Uncertainty keeps me from living a full life
  9. When it's time to act, uncertainty paralyzes me
  10. When I am uncertain, I can't function very well
  11. The smallest doubt can stop me from acting
  12. I must get away from all uncertain situations
-

## Appendix D: Cronbach's Alpha

### Cronbach's Alpha Causation

Reliability Statistics			Item Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Std. Deviation	N	
,567	,585	5	Goal-oriented	5,75	1,242	230
			Expected returns	5,17	1,652	230
			Pre-existing knowledge	3,80	1,692	230
			Competitive analysis	5,58	1,364	230
			Uncertain future	5,08	1,395	230

Inter-Item Correlation Matrix					
	Goal-oriented	Expected returns	Pre-existing knowledge	Competitive analysis	Uncertain future
Goal-oriented	1,000	,279	,121	,218	,274
Expected returns	,279	1,000	,078	,335	,261
Pre-existing knowledge	,121	,078	1,000	,063	,116
Competitive analysis	,218	,335	,063	1,000	,457
Uncertain future	,274	,261	,116	,457	1,000

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Goal-oriented	19,63	15,125	,346	,130	,505
Expected returns	20,20	12,984	,361	,164	,490
Pre-existing knowledge	21,58	15,362	,135	,023	,632
Competitive analysis	19,80	13,872	,421	,261	,461
Uncertain future	20,30	13,624	,431	,251	,453

### Cronbach's Alpha Effectuation

Reliability Statistics			Item Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Std. Deviation	N	
,805	,804	5	Effectuation1	3,46	2,003	230
			Effectuation2	4,54	1,767	230
			Effectuation3	4,31	1,811	230
			Effectuation4	3,67	1,846	230
			Effectuation5	3,33	1,917	230

Inter-Item Correlation Matrix					
	Effectuation1	Effectuation2	Effectuation3	Effectuation4	Effectuation5
Effectuation1	1,000	,428	,532	,327	,624
Effectuation2	,428	1,000	,395	,331	,407
Effectuation3	,532	,395	1,000	,477	,485
Effectuation4	,327	,331	,477	1,000	,501
Effectuation5	,624	,407	,485	,501	1,000

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Effectuation1	15,86	31,032	,632	,482	,754
Effectuation2	14,78	35,545	,497	,250	,794
Effectuation3	15,01	32,917	,623	,403	,757
Effectuation4	15,64	34,423	,522	,337	,788
Effectuation5	15,98	31,013	,677	,499	,739

### Cronbach's Alpha Culture

Reliability Statistics			Item Statistics			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Std. Deviation	N	
,711	,709	6	Culture1	4,20	1,336	230
			Culture2	3,77	1,408	230
			Culture3	3,69	1,385	230
			Culture4	2,79	1,345	230
			Culture5	4,03	1,311	230
			Culture6	3,31	1,340	230

Inter-Item Correlation Matrix						
	Culture1	Culture2	Culture3	Culture4	Culture5	Culture6
Culture1	1,000	,532	,388	,011	,268	,290
Culture2	,532	1,000	,636	,067	,305	,470
Culture3	,388	,636	1,000	-,011	,347	,468
Culture4	,011	,067	-,011	1,000	,106	,038
Culture5	,268	,305	,347	,106	1,000	,411
Culture6	,290	,470	,468	,038	,411	1,000

Item-Total Statistics						
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	
Culture1	1,000	,532	,388	,011	,268	,290
Culture2	,532	1,000	,636	,067	,305	,470
Culture3	,388	,636	1,000	-,011	,347	,468
Culture4	,011	,067	-,011	1,000	,106	,038
Culture5	,268	,305	,347	,106	1,000	,411
Culture6	,290	,470	,468	,038	,411	1,000

Cronbach's Alpha uncertainty

Reliability Statistics			Item Statistics					
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Mean	Std. Deviation	N			
,882	,881	12	Uncertainty1	2,41	1,073	230		
			Uncertainty2	3,24	1,159	230		
			Uncertainty3	3,89	,899	230		
			Uncertainty4	2,46	1,220	230		
			Uncertainty5	3,04	1,298	230		
			Uncertainty6	2,43	1,122	230		
			Uncertainty7	3,19	1,246	230		
			Uncertainty8	2,32	1,281	230		
			Uncertainty9	1,81	1,076	230		
			Uncertainty10	2,10	1,125	230		
			Uncertainty11	1,82	,997	230		
			Uncertainty12	2,02	1,215	230		

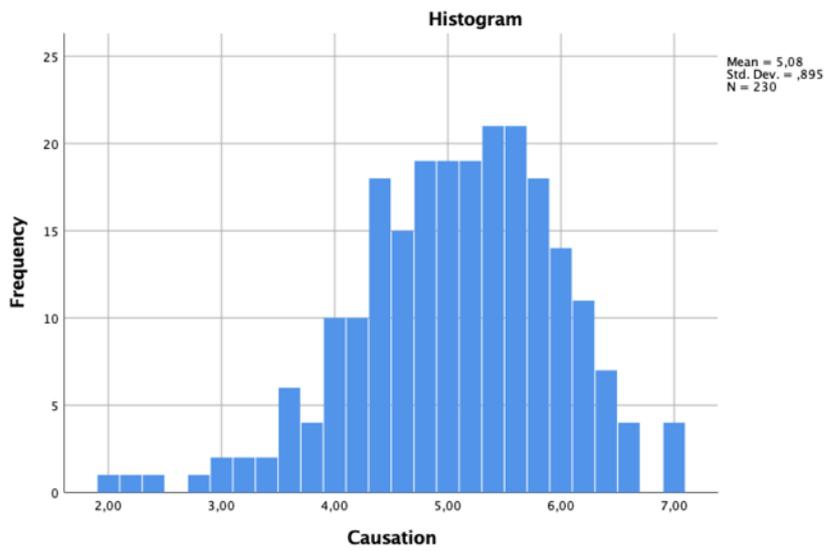
	Uncertainty1	Uncertainty2	Uncertainty3	Uncertainty4	Uncertainty5	Uncertainty6	Uncertainty7	Uncertainty8	Uncertainty9	Uncertainty10	Uncertainty11	Uncertainty12
Uncertainty1	1,000	,461	,193	,512	,376	,512	,267	,425	,366	,350	,412	,406
Uncertainty2	,461	1,000	,277	,305	,414	,360	,364	,334	,211	,280	,233	,236
Uncertainty3	,193	,277	1,000	,246	,450	,204	,335	,335	,095	,158	,085	,214
Uncertainty4	,512	,305	,246	1,000	,445	,487	,373	,432	,355	,385	,372	,457
Uncertainty5	,376	,414	,450	,445	1,000	,431	,543	,454	,350	,365	,300	,423
Uncertainty6	,512	,360	,204	,487	,431	1,000	,362	,518	,440	,379	,373	,485
Uncertainty7	,267	,364	,335	,373	,543	,362	1,000	,394	,173	,230	,129	,321
Uncertainty8	,425	,334	,335	,432	,454	,518	,394	1,000	,541	,561	,444	,605
Uncertainty9	,366	,211	,095	,355	,350	,440	,173	,541	1,000	,718	,661	,531
Uncertainty10	,350	,280	,158	,385	,365	,379	,230	,561	,718	1,000	,568	,542
Uncertainty11	,412	,233	,085	,372	,300	,373	,129	,444	,661	,568	1,000	,561
Uncertainty12	,406	,236	,214	,457	,423	,485	,321	,605	,531	,542	,561	1,000

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Uncertainty1	28,31	70,723	,590	,444	,872
Uncertainty2	27,49	71,910	,472	,325	,879
Uncertainty3	26,84	76,127	,357	,259	,883
Uncertainty4	28,27	68,818	,604	,412	,871
Uncertainty5	27,68	67,423	,630	,488	,869
Uncertainty6	28,30	69,423	,634	,448	,869
Uncertainty7	27,53	70,896	,480	,377	,879
Uncertainty8	28,41	66,225	,703	,543	,864
Uncertainty9	28,91	70,350	,611	,640	,871
Uncertainty10	28,63	69,535	,625	,585	,870
Uncertainty11	28,90	71,938	,567	,527	,873
Uncertainty12	28,71	67,771	,664	,525	,867

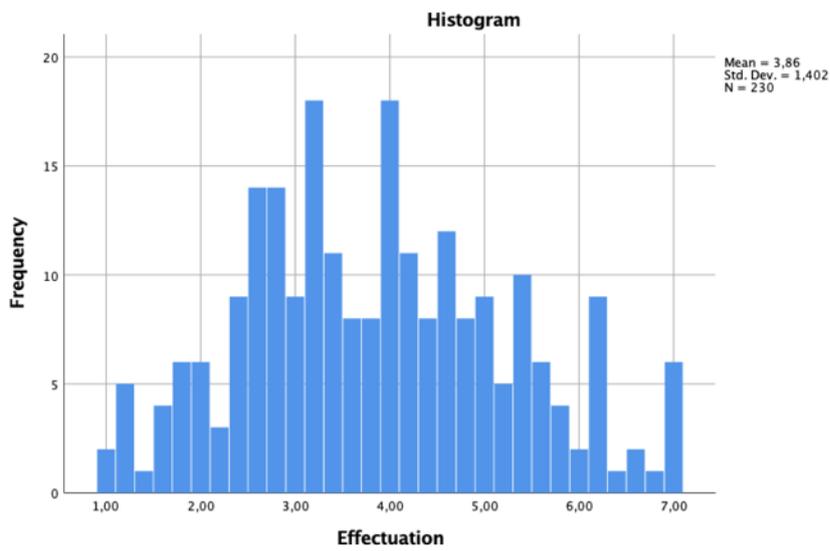
Appendix E: Test of normality

Tests of Normality			
Shapiro-Wilk			
	Statistic	df	Sig.
Causation	0,98	230	0,002
Effectuation	0,983	230	0,008
Uncertainty	0,978	230	0,001
Culture	0,995	230	0,591

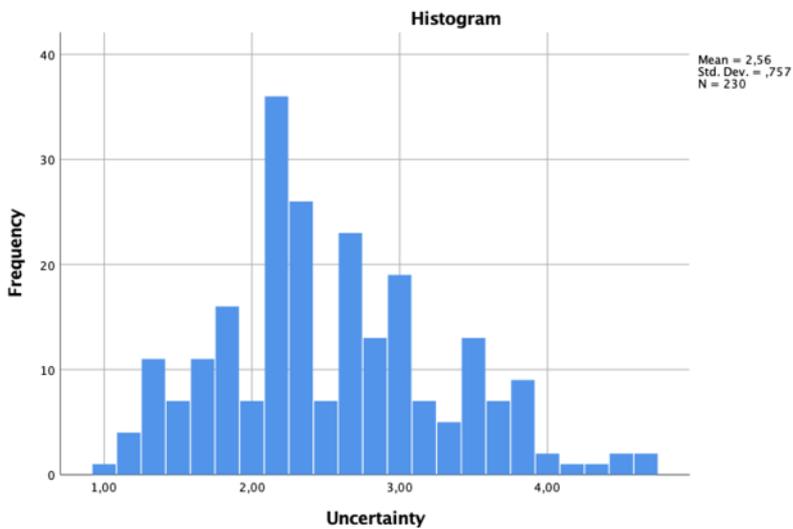
### Causation



### Effectuation



### Uncertainty



## Appendix F: Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's test of Sphericity

### Causation

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,677
Bartlett's Test of Sphericity	Approx. Chi-Square	119,025
	df	10
	Sig.	,000

### Effectuation

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,776
Bartlett's Test of Sphericity	Approx. Chi-Square	354,937
	df	10
	Sig.	,000

### Uncertainty

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,888
Bartlett's Test of Sphericity	Approx. Chi-Square	1176,309
	df	66
	Sig.	,000

### Culture

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,757
Bartlett's Test of Sphericity	Approx. Chi-Square	323,772
	df	15
	Sig.	,000

## Appendix G: Factor analysis

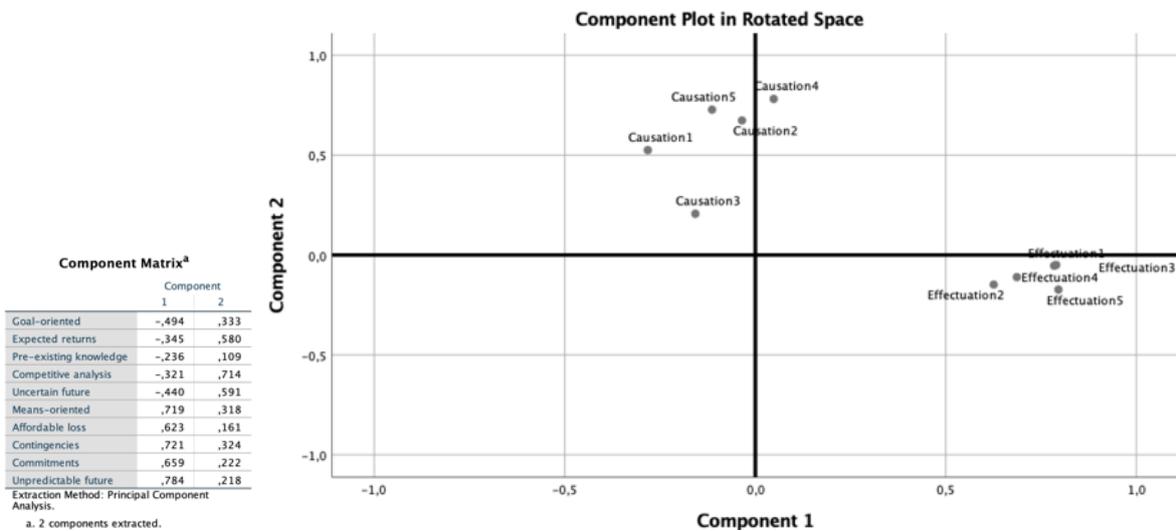
### Factor analysis causation and effectuation

Correlation Matrix <sup>a</sup>												
		Goal-oriented	Expected returns	Pre-existing knowledge	Competitive analysis	Uncertain future	Means-oriented	Affordable loss	Contingencies	Commitments	Unpredictable future	
Correlation	Goal-oriented	1,000	,279	,121	,218	,274	-,229	-,129	-,235	-,234	-,254	
	Expected returns	,279	1,000	,078	,335	,261	-,060	-,198	-,072	-,049	-,161	
	Pre-existing knowledge	,121	,078	1,000	,063	,116	,021	-,016	-,202	-,174	-,132	
	Competitive analysis	,218	,335	,063	1,000	,457	-,045	-,114	-,002	-,105	-,116	
	Uncertain future	,274	,261	,116	,457	1,000	-,175	-,139	-,154	-,130	-,197	
	Means-oriented	-,229	-,060	,021	-,045	-,175	1,000	,428	,532	,327	,624	
	Affordable loss	-,129	-,198	-,016	-,114	-,139	,428	1,000	,395	,331	,407	
	Contingencies	-,235	-,072	-,202	-,002	-,154	,532	,395	1,000	,477	,485	
	Commitments	-,234	-,049	-,174	-,105	-,130	,327	,331	,477	1,000	,501	
	Unpredictable future	-,254	-,161	-,132	-,116	-,197	,624	,407	,485	,501	1,000	
Sig. (1-tailed)	Goal-oriented		,000	,034	,000	,000	,000	,026	,000	,000	,000	
	Expected returns	,000		,118	,000	,000	,183	,001	,138	,232	,007	
	Pre-existing knowledge	,034	,118		,172	,039	,373	,407	,001	,004	,022	
	Competitive analysis	,000	,000	,172		,000	,248	,043	,489	,056	,039	
	Uncertain future	,000	,000	,039	,000		,004	,018	,010	,024	,001	
	Means-oriented	,000	,183	,373	,248	,004		,000	,000	,000	,000	
	Affordable loss	,026	,001	,407	,043	,018	,000		,000	,000	,000	
	Contingencies	,000	,138	,001	,489	,010	,000	,000		,000	,000	
	Commitments	,000	,232	,004	,056	,024	,000	,000	,000		,000	
	Unpredictable future	,000	,007	,022	,039	,001	,000	,000	,000	,000		

### Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,190	31,898	31,898	3,190	31,898	31,898	2,855	28,550	28,550
2	1,647	16,468	48,366	1,647	16,468	48,366	1,982	19,816	48,366
3	1,064	10,641	59,007						
4	,807	8,065	67,072						
5	,792	7,924	74,996						
6	,661	6,611	81,608						
7	,572	5,716	87,324						
8	,510	5,103	92,427						
9	,466	4,658	97,084						
10	,292	2,916	100,000						

Extraction Method: Principal Component Analysis.



### Inter-item correlation

#### Correlations

	Causation1	Causation2	Causation3	Causation4
<b>Causation1</b>				
<b>Causation2</b>	<b>,279**</b>			
<b>Causation3</b>	0,121	0,078		
<b>Causation4</b>	<b>,218**</b>	<b>,335**</b>	0,063	
<b>Causation5</b>	<b>,274**</b>	<b>,261**</b>	0,116	<b>,457**</b>

#### Correlations

	Effectuation1	Effectuation2	Effectuation3	Effectuation4
<b>Effectuation1</b>				
<b>Effectuation2</b>	<b>,428**</b>			
<b>Effectuation3</b>	<b>,532**</b>	<b>,395**</b>		
<b>Effectuation4</b>	<b>,327**</b>	<b>,331**</b>	<b>,477**</b>	
<b>Effectuation5</b>	<b>,624**</b>	<b>,407**</b>	<b>,485**</b>	<b>,501**</b>

## Correlations

	Culture1	Culture2	Culture3	Culture4	Culture5
Culture1					
Culture2	,532**				
Culture3	,388**	,636**			
Culture4_REV	0,011	0,067	-0,011		
Culture5	,268**	,305**	,347**	0,106	
Culture6	,290**	,470**	,468**	0,038	,411**

Correlations	1	2	3	4	5	6	7	8	9	10	11
Uncertainty1											
Uncertainty2	,461**										
Uncertainty3	,193**	,277**									
Uncertainty4	,512**	,305**	,246**								
Uncertainty5	,376**	,414**	,450**	,445**							
Uncertainty6	,512**	,360**	,204**	,487**	,431**						
Uncertainty7	,267**	,364**	,335**	,373**	,543**	,362**					
Uncertainty8	,425**	,334**	,335**	,432**	,454**	,518**	,394**				
Uncertainty9	,366**	,211**	0,095	,355**	,350**	,440**	,173**	,541**			
Uncertainty10	,350**	,280**	,158*	,385**	,365**	,379**	,230**	,561**	,718**		
Uncertainty11	,412**	,233**	0,085	,372**	,300**	,373**	,129*	,444**	,661**	,568**	
Uncertainty12	,406**	,236**	,214**	,457**	,423**	,485**	,321**	,605**	,531**	,542**	,561**

## Rotated Component Matrix

	Component			
	Causation	Effectuation	Uncertainty	Culture
Cau_1	.492			
Cau_2	.579			
Cau_3				
Cau_4	.648			
Cau_5	.545			
Eff_1		.784		
Eff_2		.627		
Eff_3		.789		
Eff_4		.663		
Eff_5		.804		
Unc_1			.68	
Unc_2			.505	
Unc_3	.42			
Unc_4			.663	
Unc_5	.409		.626	
Unc_6			.702	
Unc_7			.495	
Unc_8			.759	
Unc_9			.743	
Unc_10			.741	
Unc_11			.693	
Unc_12			.752	
Cul_1				.612
Cul_2				.804
Cul_3				.762
Cul_4Rev				
Cul_5				.618
Cul_6				.728

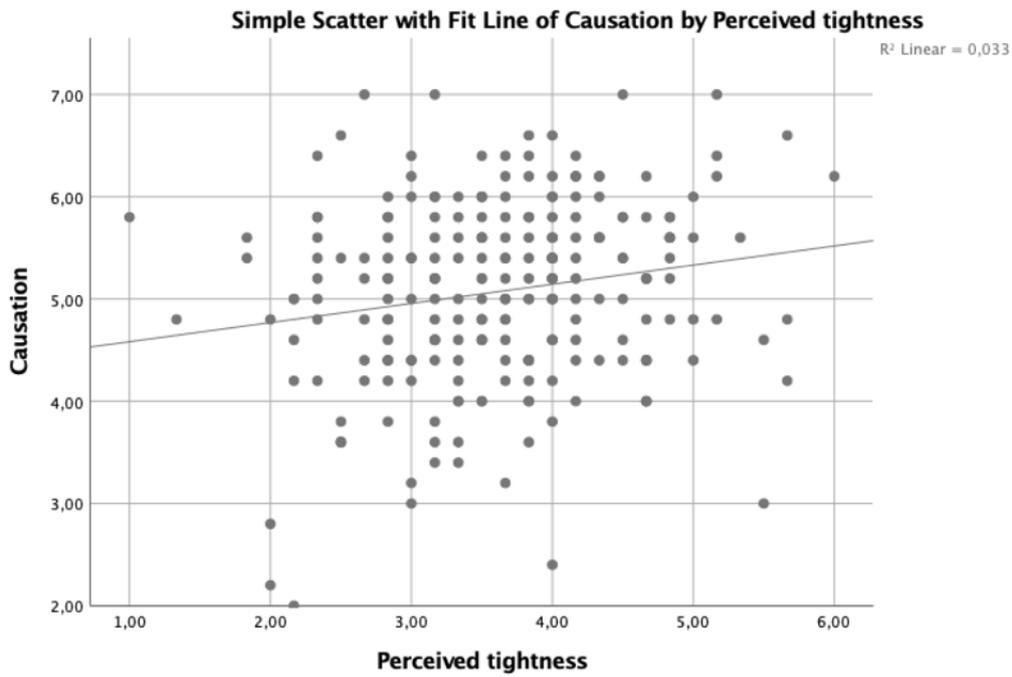
Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

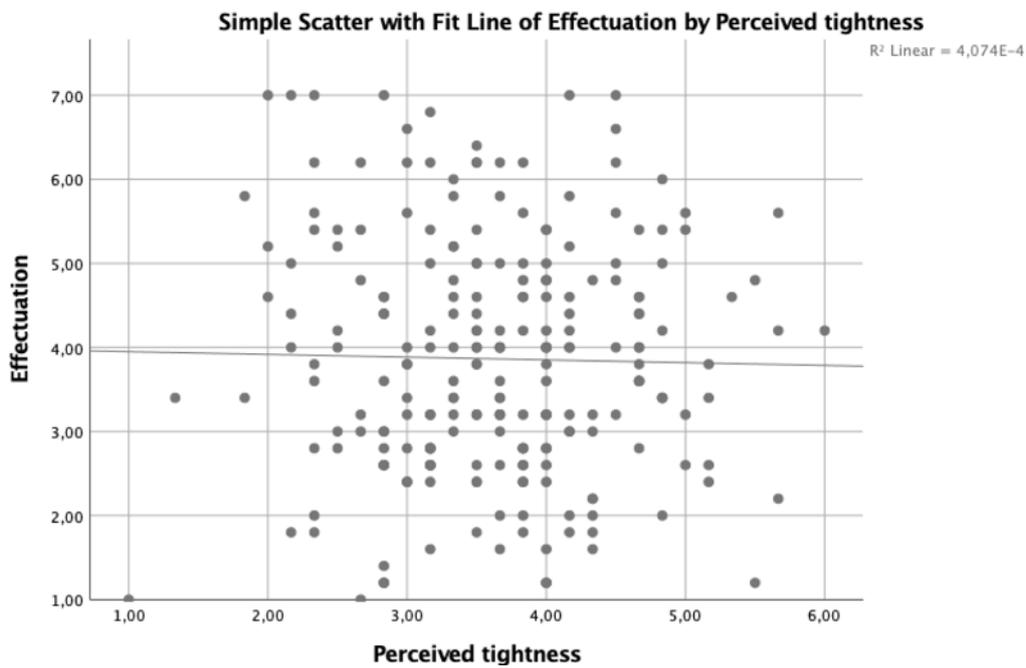
a Rotation converged in 5 iterations.

## Appendix H: Assumptions for hierarcical multiple regression

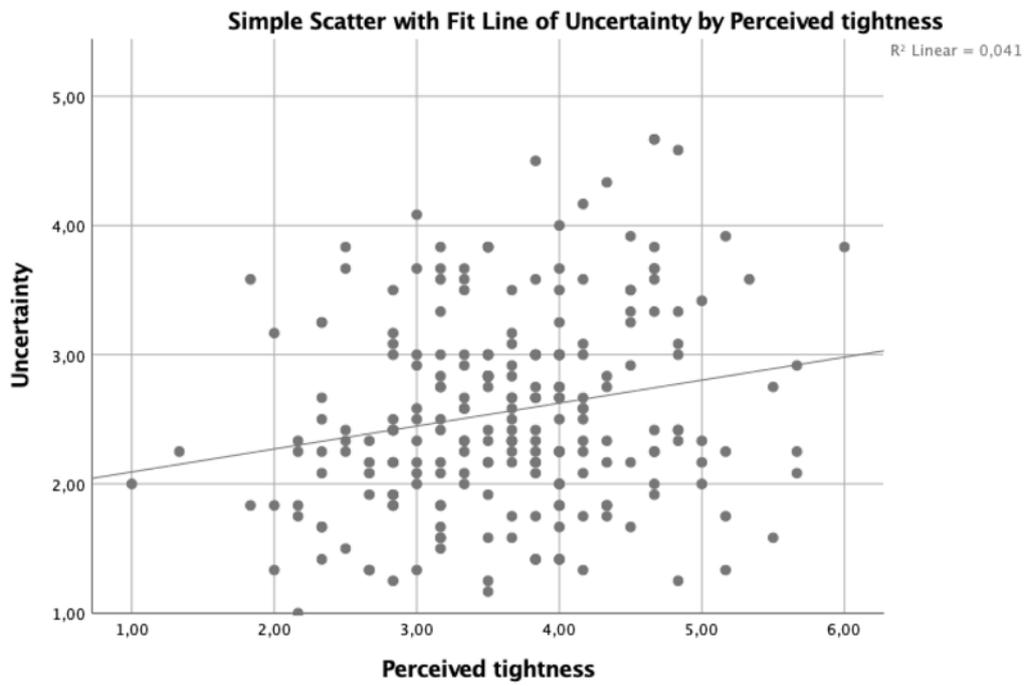
*Perceived tightness on causation*



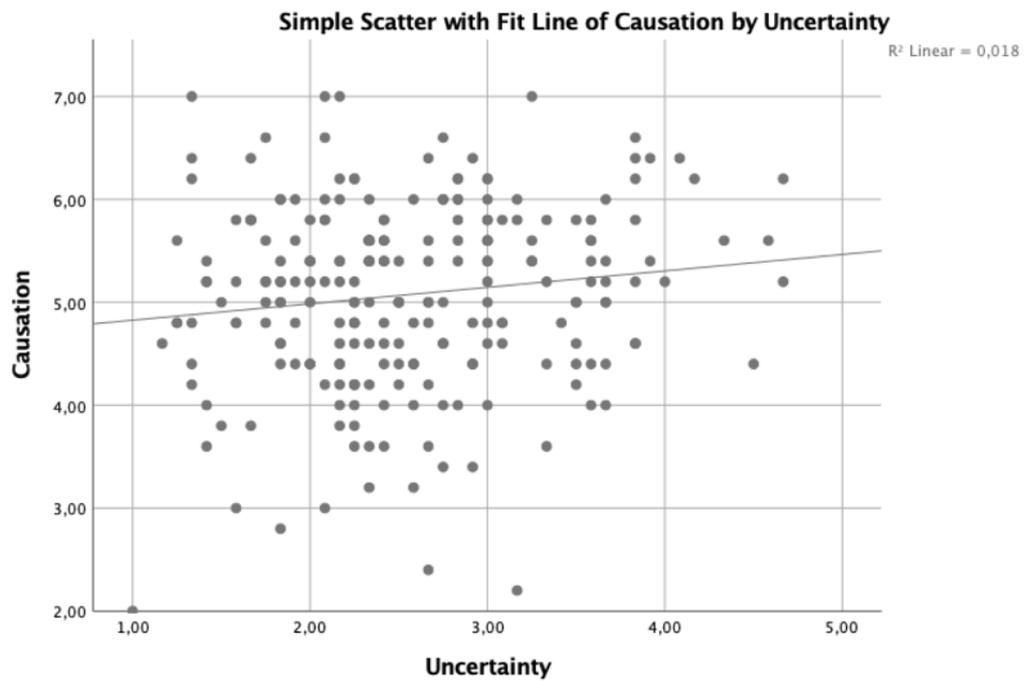
*Perceived tightness on effectuation*



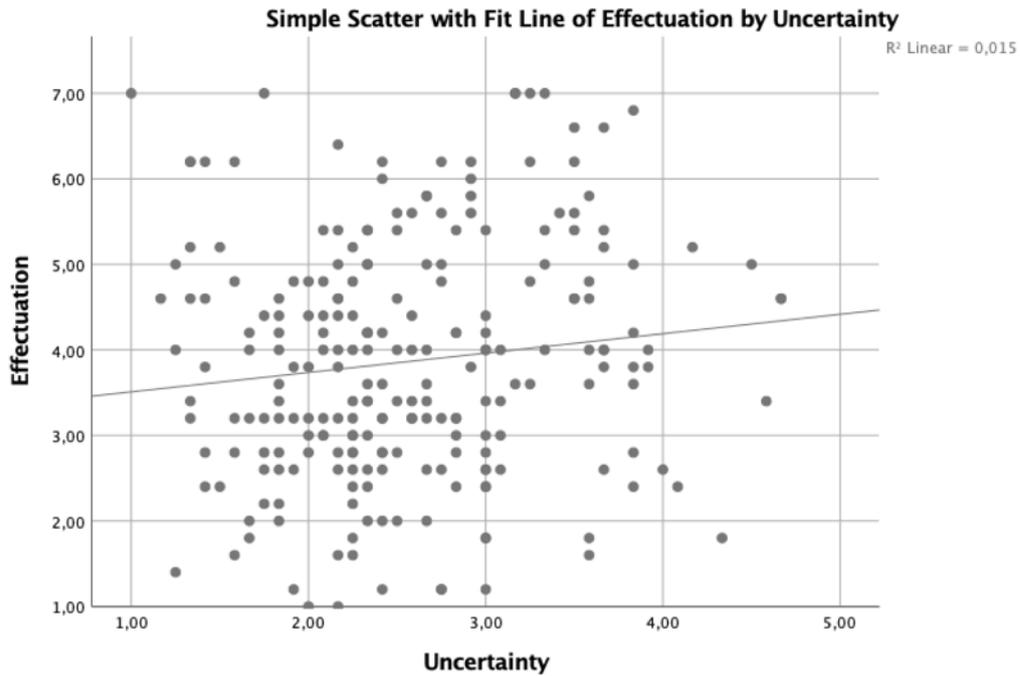
*Perceived cultural tightness on uncertainty*



*Uncertainty on causation*



Uncertainty on effectuation



Durbin-Watson statistic

Perceived tightness on causation

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,181 <sup>a</sup>	,033	,029	,88172	2,067

a. Predictors: (Constant), Perceived tightness

b. Dependent Variable: Causation

Perceived tightness on effectuation

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,020 <sup>a</sup>	,000	-,004	1,40483	1,977

a. Predictors: (Constant), Perceived tightness

b. Dependent Variable: Effectuation

Perceived tightness on uncertainty

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,203 <sup>a</sup>	,041	,037	,74288	1,878

a. Predictors: (Constant), Perceived tightness

b. Dependent Variable: Uncertainty

Uncertainty on causation

### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,135 <sup>a</sup>	,018	,014	,88838	2,005

a. Predictors: (Constant), Uncertainty

b. Dependent Variable: Causation

*Uncertainty on effectuation*

### Model Summary<sup>b</sup>

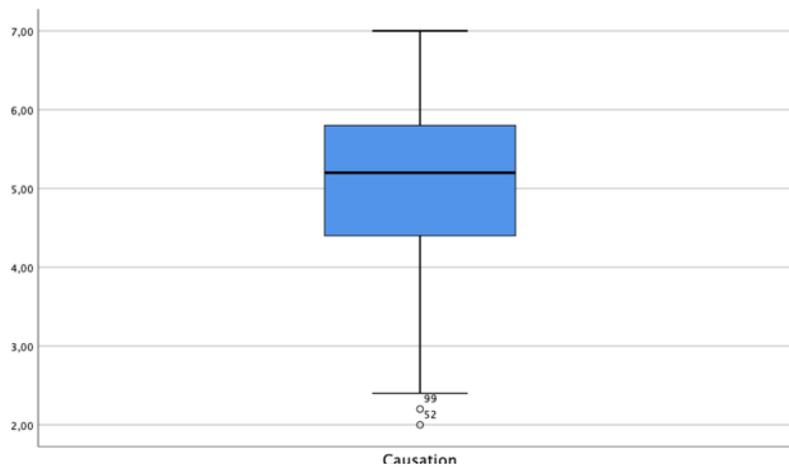
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,122 <sup>a</sup>	,015	,011	1,39455	1,955

a. Predictors: (Constant), Uncertainty

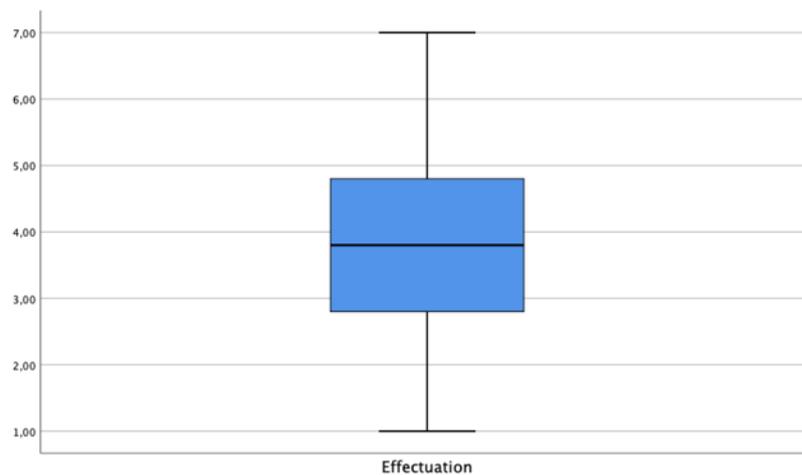
b. Dependent Variable: Effectuation

## Boxplots with a multiplier of 1.5

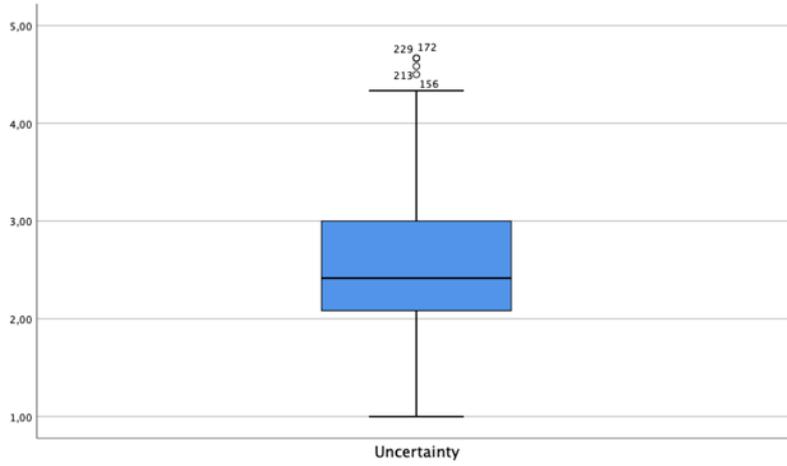
*Causation with a multiplier of 1.5, the shown outliers fit if the multiplier is 2.2.*



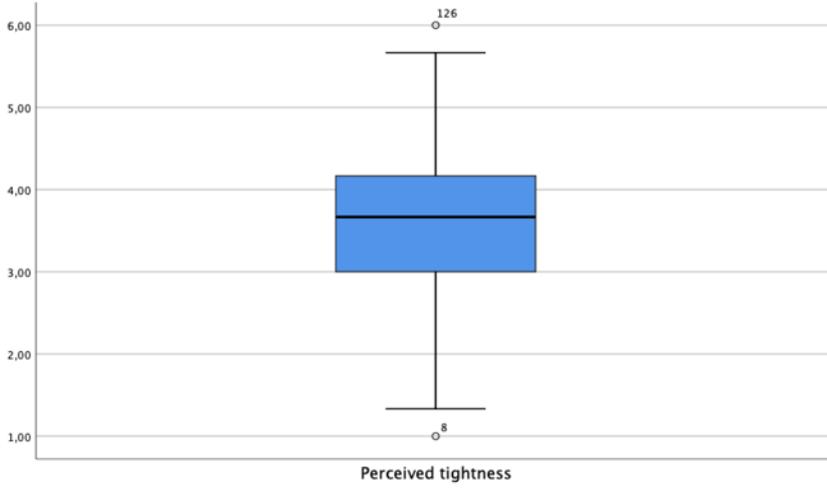
*Effectuation*



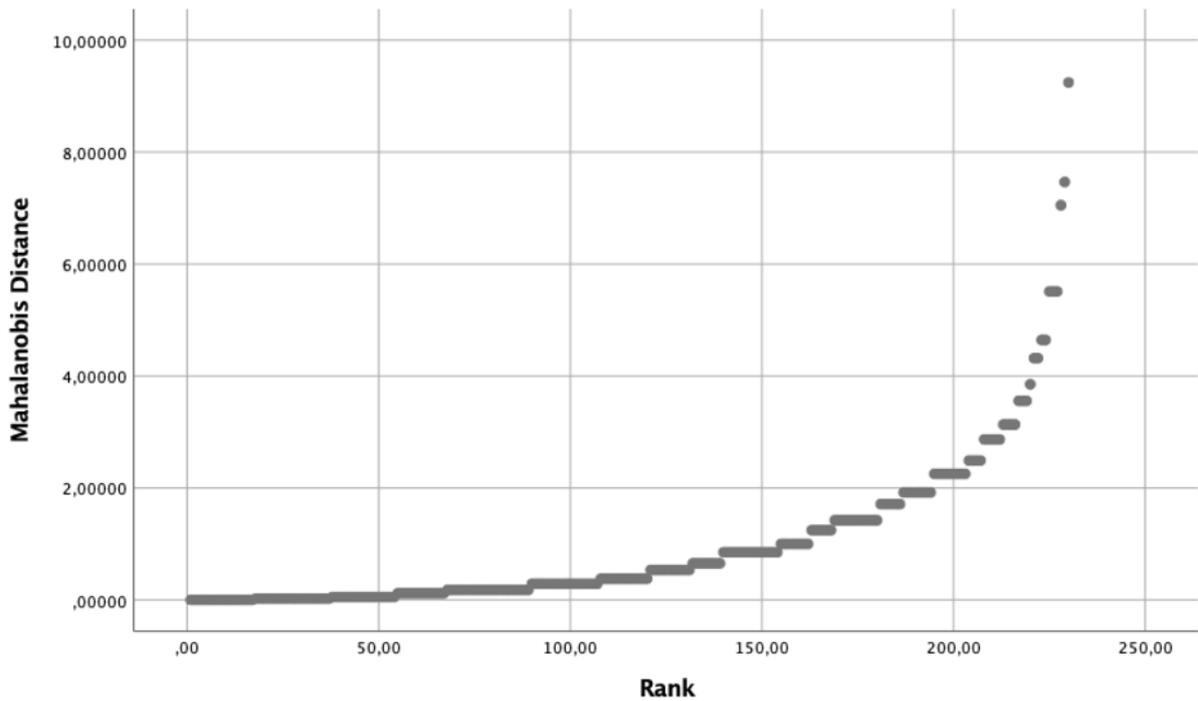
*Uncertainty with a multiplier of 1.5, the shown outliers fit if the multiplier is 2.2.*



*Cultural tightness with a multiplier of 1.5, the shown outliers fit if the multiplier is 2.2.*



**Mahalanobis Distance**



**Multicollinearity test**  
**Collinearity Statistics**

	<b>Causation</b>		<b>Effectuation</b>	
	Tolerance	VIF	Tolerance	VIF
<b>Age</b>	.448	2,231	.448	2,231
<b>Gender</b>	.857	1,167	.857	1,167
<b>Nationality</b>	.930	1,075	.930	1,075
<b>Degree</b>	.880	1,136	.880	1,136
<b>Study</b>	.839	1,192	.839	1,192
<b>Ventures</b>	.578	1,729	.578	1,729
<b>Experience</b>	.348	2,871	.348	2,871
<b>Employees</b>	.832	1,201	.832	1,201
<b>Industry</b>	.862	1,160	.862	1,160
<b>Objective</b>	.915	1,092	.915	1,092
<b>Culture</b>	.856	1,169	.856	1,169
<b>Uncertainty</b>	.920	1,087	.920	1,087