

# **The Dynamic Application of Effectual and Causal Decision-making in Low-Uncertainty New Venture Creation**

## **Master Thesis**

## **Behavioural Management & Social Sciences**

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## **Abstract**

The theory of effectuation would benefit greatly from more empirical studies researching the application of effectual and causal decision-making in new venture creation. Furthermore, the theory would benefit from research identifying what conditions drive entrepreneurs to apply causal or effectual decision-making. This current study makes a contribution here by exploring the role of effectuation in new venture creation with low-uncertainty, focusing on what dimensions of effectuation and causation play a role in the decision-making of entrepreneurs across separate stages of new venture creation. A qualitative analysis on the decision-making of both novice and expert entrepreneurs provides new insights in how effectuation and causation are dynamically applied in the process of new venture creation.

The results yield the following three insights: 1) entrepreneurs apply both effectuation and causation when creating their venture in an environment that has low-uncertainty. 2) Novice entrepreneurs apply more effectual decision-making in the beginning of new venture creation but shift to more causal decision-making as their venture matures, whereas expert entrepreneurs apply a mix of effectual and causal methods throughout the new venture creation process. 3) The need to attract additional finance during new venture development forces entrepreneurs to apply more causal decision-making.

**Key words:** Decision-making, Effectuation, Causation, New venture creation, Novices, Experts, Uncertainty

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# 1 Introduction

The way entrepreneurs make business decisions in new venture creation, and the effects thereof, are increasingly studied. Brinkmann *et al.* (2010) point out that entrepreneurship research engages in an intense debate about the value of business-planning. Some researchers believe planned based decision-making is crucial for the survival and development of new firms (Brinckmann *et al.*, 2010; Delmar and Shane, 2003), whereas others argue that entrepreneurs should just 'storm the castle', focusing on improvisation (Baker *et al.*, 2003) and combining resources at hand to new problems and opportunities (Baker and Nelson, 2005).

One of the researchers in the field of planners and 'stormers' is Sarasvathy, who introduced the theory of effectuation in 2001, stating that the most important agent in entrepreneurship is an effectuator: someone who seizes uncertain opportunities and exploits everything at hand to create what he/she wants to create. Her theory differentiates two decision-making models for entrepreneurs; effectuation ('stormers') and causation (planners). In *effectual* decision-making, entrepreneurs create one of many possible effects using the means available to them. In *causal* decision-making entrepreneurs create a certain given effect by changing the means available to them. The theory of effectuation can help to explain how entrepreneurs differ from others in their decision-making when creating new ventures.

The theory of effectuation has been a topic of debate with supporters (e.g. Covielle and Joseph, 2012; Fisher; 2012), and critics (e.g. Arend *et al.*, 2015; Baron, 2009; Chandler *et al.*, 2011; Chiles *et al.*, 2007). Previous work in effectuation theory resulted in several directions for future research, of which three are discussed here. Firstly, researchers have been discussing the theory mostly at a conceptual level and many scholars called for more empirical research in the field of effectuation (Arend *et al.*, 2016; Gupta *et al.*, 2016; Read *et al.*, 2016; Reuber, Fisher & Coviello, 2016; Garud & Gehman, 2016). Furthermore, most previous empirical work in the field of effectuation has been quantitative, using surveys (Chandler *et al.*, 2011). However, Arend *et al.* (2015) argue that previous quantitative research was unable to control for the subtleties involved with the various components of the theory of effectuation, and argue that effectuation theory would benefit from more qualitative research.

Effectuation and causation are presented as a dichotomy in most previous empirical research on effectuation theory (for example in Brettel *et al.*, 2011; Harms & Schiele, 2012; Chandler *et al.*, 2011; Johansson & McKelvie, 2012), implying that entrepreneurs rely on causal *or* effectual decision-making throughout the entire process of new venture creation. In reality, entrepreneurs use both causal and effectual decision-making when creating their businesses (Sarasvathy, 2001; Arend *et al.*, 2015; Wiltbank *et al.*, 2006; Sarasvathy, 2008) and some of the effectual processes within effectuation theory even start with a causal approach (Arend *et al.*, 2015). Therefore, effectuation theory would

benefit from identifying the conditions under which causal or effectual approaches are necessary and how entrepreneurs can best mix causal and effectual decision-making (Read *et al.*, 2016). This requires an approach in which effectuation and causation are treated as independent constructs that can co-occur.

Most previous research (Reymen *et al.*, 2015; Jiang & Tornikoski (2018) among others) analyzed effectual and causal decision-making by researching entrepreneurs operating in different, mostly high-tech, industries, and sought to compare the decision-making of entrepreneurs operating in different environments. Those studies might have struggled to control for the unique uncertainty and environmental factors that influence the decision-making of the subject of study (Arend *et al.*, 2015; Sarasvathy, 2008). An analysis of entrepreneurs operating in the same market, facing the same challenges, would nullify the impact of environmental differences on the decision-making of entrepreneurs.

It seems well established in the current literature that effectuation theory is best applied under circumstances with greater uncertainty (e.g. Sarasvathy, 2001; Read *et al.*, 2009b; Fisher, 2012), particularly in high-technology new venture creation. Research in the field of effectuation thus mostly focused on high-tech new venture creation in uncertain environments (Reymen *et al.*, 2015; Jiang & Tornikoski, 2018). However, there seems to be a desire to better understand what role effectuation theory plays in circumstances without technological uncertainty (Reymen *et al.*, 2015) and under what circumstances entrepreneurs apply effectual decision-making (Arend *et al.*, 2015; Sarasvathy, 2008). This study aims to make a contribution here by focusing on the role of effectuation in venture creation within a predictable environment. Predictable environments should stimulate causal decision-making (Sarasvathy, 2001), and it would therefore be interesting to better understand the role of effectuation in the new venture creation process of ventures created in predictable environments.

The level of entrepreneurial expertise is generally considered to be the other important factor determining if entrepreneurs apply effectual or causal methods (Dew *et al.*, 2009b; Sarasvathy, 2008 among others). Most studies relate expert entrepreneurship to effectuation and novice entrepreneurship to causation (Dew *et al.*, 2009b; Fischer & Reuber, 2011, Politis *et al.*, 2012). Fischer and Reuber (2011) argue that the only variable justifying the use of the effectual process is expertise. This might explain why the majority of the research in the field of effectuation has been focusing on experienced entrepreneurs. Novice entrepreneurs are often believed to be unable to create a new venture using effectual decision-making (Arend *et al.*, 2015), even though this is contrasted by Reymen *et al.* (2015), who did not find support for the assertion that effectual decision-making is related to



levels of entrepreneurial expertise. This study will explore the differences between novices and experts in predictable environments.

Effectuation theory would benefit from focusing on when entrepreneurs did or did not use effectual decision-making, and when and why it did not work (Arend *et al.* 2015). Reymen *et al.* (2015) contributed to better understanding the dynamic application of causal and effectual decision-making in new venture creation by associating stages of new venture creation with effectual and causal decision-making. By including stages, their study allowed measurements of effectuation and causation at different points in time and thus the evolution of the role of effectuation and causation in entrepreneurial decision-making could be analyzed. Reymen *et al.* (2015) invited others to do additional research in order to better understand the application of causal and effectual decision-making at separate points within the new venture creation process. This study aims to make a contribution to effectuation theory by researching the dynamic application of effectual and causal decision-making in predictable, new venture creation. The following research questions will be addressed: *(1) How does the use of effectual and causal decision-making evolve during the venture creation process in firms operating in a predictable environment? And (2) what may drive shifts in the use of effectual and causal decision-making?*

## 2 Theoretical Foundations

In order to answer the research question, this chapter provides more theoretical background information to clarify what is meant with the concepts used in this study. First, three stages of new venture creation are discussed, elaborating on the three periods of time in which entrepreneurs make business decisions. The entrepreneurs making these business decisions can be considered an expert, or a novice, and chapter 2.2 elaborates on entrepreneurial expertise by creating a boundary for an entrepreneur to be considered a novice, or an expert. The business decisions that the experts or novices take during the three stages of new venture creation be either effectual, causal, or a mix of the two logics. Chapter 2.3 elaborates on effectuation theory and explains how entrepreneurs create new ventures either by using the means available to them (effectual) or by changing their means to pursue a given goal (causal). Finally, the concepts are brought together in a conceptual framework, which bridges the theoretical foundations with the methodology chapter.

### 2.1 New venture creation

New venture creation is the process that begins with an idea for a business (Bhave, 1994) and evolves over time (Gartner, 1985). Entrepreneurs create ventures in many different ways, applying different decision-making across various points in time (Gartner, 1985; Bhave, 1994;). A stage-model for new venture creation allows a researcher to analyze strategic decision-making of entrepreneurs across various points in time (Reymen *et al.*, 2015). This section introduces a three-stage model which enables the placement of entrepreneurial decisions in three stages of new venture creation (figure 1). The three stages are briefly discussed.

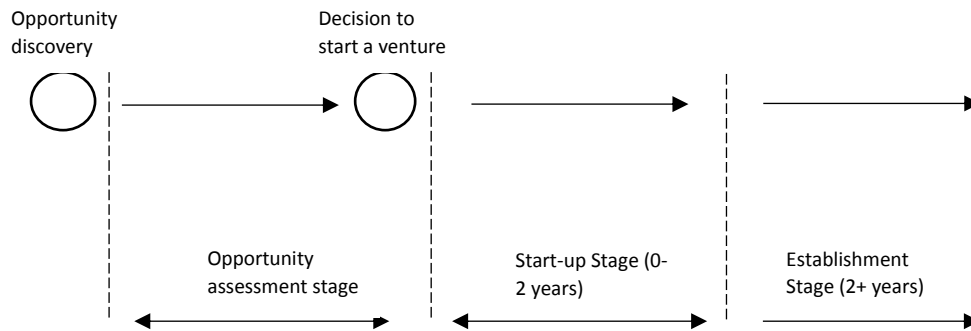
#### 2.1.1. Stage 1: Opportunity Assessment

In the first stage, the entrepreneur decides if an opportunity is worth chasing. The first stage starts *after* the entrepreneur has already discovered an opportunity to start a venture, since people do not discover an opportunity by actively searching for them (Shane, 2000). Entrepreneurs do however make decisions by assessing opportunities. The moment entrepreneurs make the formal decision to start the venture the first stage is completed.

#### 2.1.2 Stage 2: Start-up Stage

The second stage involves all decision made in the first two years after the formal decision was made to start a venture. This stage typically starts with the production technology set-up and the creation of the supporting organization (Bhave, 1994). The venture will progressively get more familiar with its processes, tweaking products, services and processes.

**Figure 1, Three stages of new venture creation**



### 2.1.3 Stage 3: Establishment Stage

This stage starts after the first two years of the venture have been passed. The venture has developed its processes and the entrepreneur has become more familiar with the venture, allowing for quicker decision-making in the day-to-day processes. The ventures should be growing at a high rate in this stage and entrepreneurs are generally giving away more task to employees. The entrepreneur now has experience with leading the venture.

## 2.2 Novice and expert entrepreneurs

As aforementioned in the introduction, the level of entrepreneurial expertise is associated with the application of effectual decision-making. In effectuation literature, entrepreneurs are generally divided in novice entrepreneurs and expert entrepreneurs (Dew *et al.*, 2009b; Sarasvathy, 2008 among others). Several studies sought to identify the differences between expert and novice entrepreneurs. This was mostly done by focusing on entrepreneurs engaging in hypothetical start-up processes (e.g. Sarasvathy, 2008; Dew *et al.*, 2009b, Read *et al.*, 2009a). Previous studies that focused on entrepreneurs running ongoing businesses resulted in studies indicating that there is a difference between experts and novices (Fischer & Reuber, 2011) and studies suggesting there is not (Reymen *et al.*, 2015).

There is little consensus to when an entrepreneur is classified an expert (Arend *et al.*, 2015). Some researchers argue that expert entrepreneurs are “individuals who had either started a business that has been in existence for more than 2 years or started three of more businesses, at least one of which is a profitable, ongoing entity (Mitchell & Chesteen, 1995).” Others classify experts as “individuals with over 15 years of experience and proven superior performance” (Dew *et al.*, 2009b, p.288). I argue the most crucial difference between a novice and an expert entrepreneur is in the lessons learned in the earliest stages of creating a new venture and the experience gained by running a venture in the first

two years. Hence, this study applies the classification of Mitchell & Chesteen (1995), considering entrepreneurs with over two years of experience experts and under two years of experience novices.

### 2.3 The theory of effectuation

In this chapter, the distinction between effectual and causal processes of decision-making is explained, particularly focusing on the characteristics of effectual decision-making. Whereas causal decision-making seeks to build towards one predicted future scenario, effectual decision-making seeks to exploit current opportunities to advance to one of the many possible advantageous future scenarios. Effectual decision-making has been characterised in terms of four dimensions, namely means oriented, affordable loss, pre-commitment and leveraging contingencies.

#### 2.3.1 The effectual process

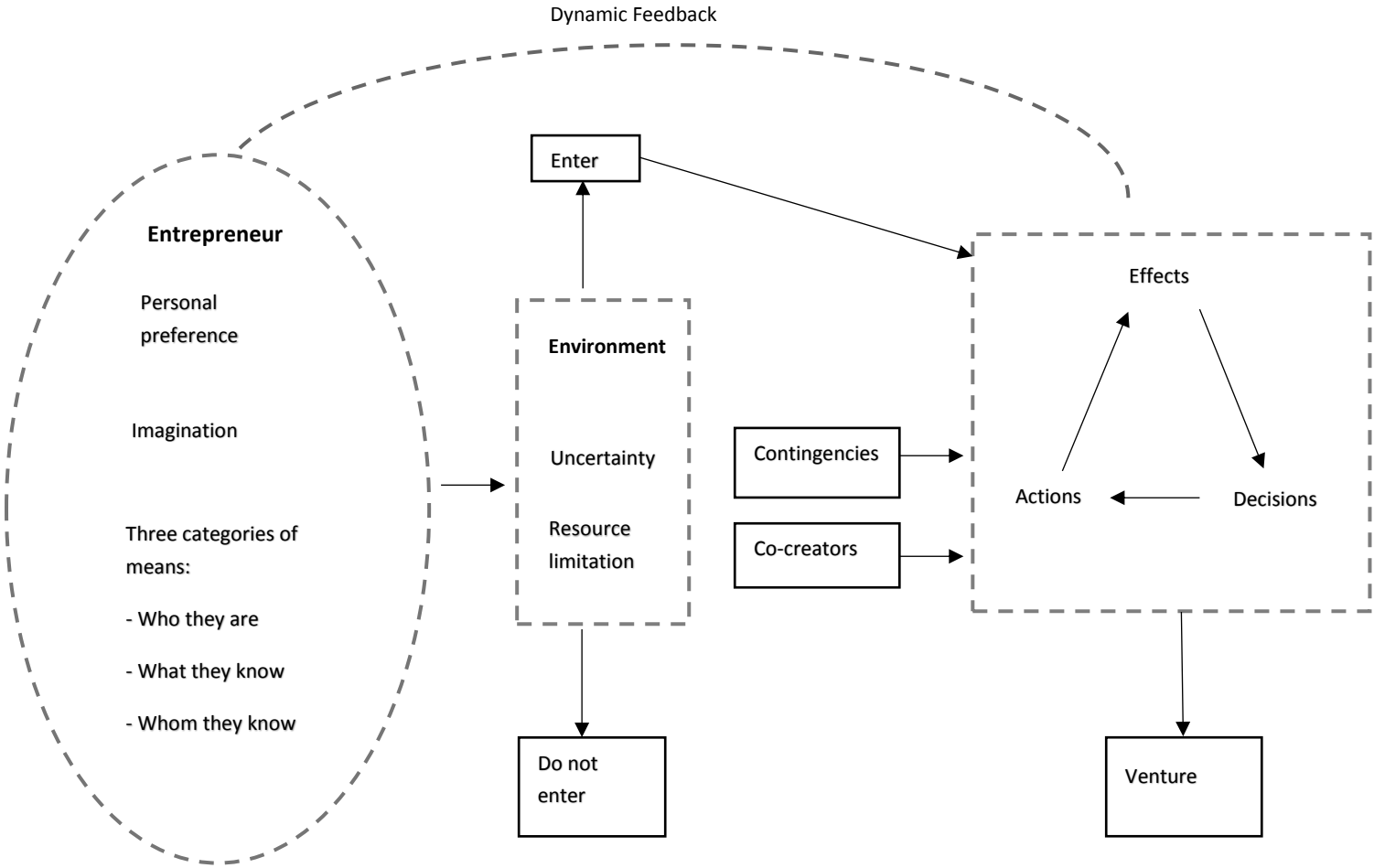
Sarasvathy (2001) differentiates between entrepreneurs who make decisions based on planning and predicting methods, referred to as causation, and entrepreneurs who make decisions based on what they can control, referred to as effectuation. In causal decision-making models, entrepreneurs use techniques, such as market analysis, seeking to predict the future in order to achieve a certain goal. Causal methods are good for exploiting opportunities when reliable predictions of the future can be made or when a venture is in possession of a strong competitive advantage over its competitors (Sarasvathy, 2001). However, according to Sarasvathy (2001), there is a growing number of entrepreneurial decision-making where entrepreneurs do not rely on planning and predictions and there was a need for a new model.

Inspired by Mintberg (1991), Sarasvathy (2001) argues that planning 'is not strategy formation' (Sarasvathy, 2001, p. 255) and that evidence insinuates that there is need for a different model that better captures entrepreneurial decision-making. Hence, she introduced the theory of effectuation, which focuses on synthesis and action rather than analysis and prediction; effectual decision-making focuses on controlling the future instead of predicting the future.

The process of effectuation starts with entrepreneurs having certain human aspirations, imagination and three categories of means: a) who they are, b) what they know, and c) whom they know (Sarasvathy, 2001). Entrepreneurs encounter environments, which are uncertain and resource limited. (Arend *et al.*, 2015; Sarasvathy, 2001). The entrepreneurs choose to start a new venture in this environment or not to enter the environment. When a new venture is started, the entrepreneur will create effects by combining the means available to him/her with their imagination. These effects have to be in line with their personal preferences, which can change during the process. The effects lead to decisions, decisions lead to actions, which then result in new effects. During this process, co-creators and contingencies change the means available and thus the effects that can be created. Contingencies are welcomed since they can direct the firm into a direction that would otherwise be ignored (Read *et*

al., 2009b). The co-creators bring new ideas to the table and as the number of co-creators increase, the means available also increases. If the resulting effect created with the means is in line with all stakeholder’s aspirations, the process ends, and a new venture is created (figure 2).

**Figure 2**  
**The Effectual Process**



The distinguishing difference between effectuation and causation is in the set of choices: effectuation processes takes the set of means as given and focuses on selecting between possible effects that can be created with that set of means. On the contrary, causation processes take a particular effect as given and focus on selecting between means to create that effect. As aforementioned, entrepreneurs do not stick to one of the two approaches, both causation and effectuation are integral parts of human reasoning that can occur simultaneously, overlapping and intertwining in different contexts of decisions and actions (Dew *et al.*, 2009b).

### 2.3.2 Dimensions of effectuation

Entrepreneurs have underlying beliefs about future phenomena that influence the logic on which they make decisions. The underlying beliefs of entrepreneurs have been captured in four dimensions in some previous research (Chandler *et al.*, 2011; Brettel *et al.*, 2012; Reymen *et al.*, 2015) whereas other researchers used five dimensions (Sarasvathy, 2001; Alsos *et al.*, 2014). The dimension of debate is concerned with controlling an unpredictable future (effectual) rather than predicting an uncertain one (causal). I agree with the researchers stating that the control dimension is represented within the other four dimensions and thus most closely follow the approach of Reymen *et al.* (2015), Brettel *et al.* (2012) and Chandler *et al.* (2011), using four dimensions. Each dimension will be briefly addressed, elaborating on the difference between effectuation and causation.

#### *Basis for taking action: Means-orientated vs Goal-orientated*

The first of these dimensions are the basis upon which entrepreneurs take actions, and what represents the determining factor in those decisions. Causal decision-making begins with setting a goal, such as achieving a market share, and action flows from that, such as mapping business environments, analysing competition and developing markets; the basis for action is a plan that optimises the pursuit of these established goals and the entrepreneur then arranges the necessary resources to deliver that plan. By contrast, effectual decision-making bases the possible decisions made on what assets entrepreneurs currently have available to them. Entrepreneurs identify an effect that can be created with these assets and seek to achieve that effect; the completion of the effect in turn shapes those assets and conditions future possibilities, meaning that potential possible effects change over time.

#### *View of risk and resources: Affordable loss vs Expected returns*

Entrepreneurs have to decide what they are willing to lose (their affordable loss) in order to start a venture (Dew *et al.*, 2009a). Causal decision-making focuses on maximizing returns in the present. Usually, investments are calculated based on possible scenarios and investors are requested to invest as much as possible to maximize the returns. Conversely, effectual decision-making regarding investments is bounded by what individuals can afford to lose. With these resources the entrepreneur and other stakeholders of the venture experiment with as many strategies as possible. The focus is to create more options in the future while remaining flexible.

**Table 1, four dimensions of effectuation and causation**

<b>Dimension</b>	<b>Causation</b>	<b>Effectuation</b>
Basis for taking action	Goal-orientated	Means-orientated
View of risk and resources	Expected returns	Affordable loss
Attitude towards others	Competitive Analyses	Pre-Commitment
Attitude towards contingencies	Avoiding contingencies	Leveraging contingencies

*Attitude towards others: Pre-Commitment vs Competitive Analysis*

The attitude towards others is concerned with how the entrepreneurs interact with other organizations when setting up their venture. In causal decision-making entrepreneurs' attitude towards others are based on competitive analyses (Sarasvathy, 2001; Sarasvathy & Dew, 2005) and only organizations that can add to the company goals are considered potential partners. Alternatively, effectuation emphasizes strategic alliances and pre-commitments from stakeholders (Sarasvathy S. D., 2001). In the effectual model, entrepreneurs start a process of talking and negotiating with different parties early in the process. These parties become stakeholders and commit their resources in exchange for the possibility to influence the future results. (Wiltbank *et al.*, 2006; Sarasvathy & Dew, 2005).

*Attitude towards unexpected events: Leveraging contingencies vs Avoiding contingencies*

Unexpected events are a part of every environment and every organization has to deal with contingencies. Causal decision-making focuses on continuing with the strategy that has been constructed. Entrepreneurs applying causal decision-making therefore tend to avoid contingencies, for example by hedging against them (Wiltbank *et al.*, 2006). In contrast, effectuation focuses on exploiting these contingencies and considers contingencies a welcome surprise that can open doors and commit more stakeholders to their network (Sarasvathy *et al.*, 2014).

## 2.4 Conceptual framework

A model that connects the theory of effectuation and new venture creation is created in this section for two main reasons. The first reason is that this study addresses if entrepreneurs apply both causal and effectual decision-making, or if entrepreneurs rely mostly on one logic throughout the entire new venture creation process. In order to measure how effectual and causal entrepreneurial decision-making evolves over time, the three stages of new venture creation provide three separate points in time where decisions can be measured by the four dimensions. I created empirical indicators for each of these dimensions in the three stages of new venture creation based on effectuation theory literature (Sarasvathy, 2008; Read *et al.*, 2009b; Alsos *et al.*, 2014; Reymen *et al.*, 2015) (Table two). The second purpose of the model is to gain insight in what dimensions change the most as the venture moves from the first to the third stage. Table two includes all causal and effectual dimensions in every stage of new venture creation. In chapter six, the model is revisited after the most important dimensions per stage are identified.

This study also addresses if novice and expert entrepreneurs apply more causal or effectual decision-making. Table two provides a model that allows a comparison of novices and experts on levels of effectuation and causation. The development of the difference between expert and novices across separate stages of new venture creation provides insight in how the difference between experts and novices changes over time.



**Table 2, Effectual and causal dimensions per stage of new venture creation (part 1)**

MO = Means Orientated		GO = Goal Orientated		LC = Leverage Contingencies		AC = Avoid Contingencies		
PC = Pre-commitment		CA = Competitive Analysis		AL = Affordable Loss		ER = Expected Returns		
<b>Stage 1 – Opportunity Assessment Stage</b>	<b>Effectuation</b>			<b>Causation</b>				
	<i>MO</i>	<ul style="list-style-type: none"> <li>Define rough visions of the future direction of the venture, leaving details open.</li> <li>Assess what can be created with current identity, knowledge and network.</li> <li>Build on existing network of contacts to discuss and assess opportunities.</li> </ul>			<i>GO</i>	<ul style="list-style-type: none"> <li>Define long-term specific goals for the venture.</li> <li>Assess what has to be changed in current identity, knowledge and network to achieve the goal.</li> <li>Search for experts to discuss and assess opportunities.</li> </ul>		
	<i>LC</i>	<ul style="list-style-type: none"> <li>Allow alterations to be made in the future by not committing to long-term contracts and agreements.</li> <li>Incorporate flexibility to deviate from plans in future.</li> </ul>			<i>AC</i>	<ul style="list-style-type: none"> <li>Design a plan to work systematically towards long-term goals.</li> <li>Create worst-case scenarios and develop exit-plans in case things go wrong.</li> </ul>		
	<i>PC</i>	<ul style="list-style-type: none"> <li>Involve as many stakeholders as possible when assessing opportunity.</li> <li>Assess potential collaborations with stakeholders.</li> </ul>			<i>CA</i>	<ul style="list-style-type: none"> <li>Carry out market analysis and competitive positioning.</li> <li>Carefully discuss opportunity with people in environment for secrecy reasons</li> </ul>		
	<i>AL</i>	<ul style="list-style-type: none"> <li>Base assessment of opportunity on what can be achieved with resources one can afford to lose.</li> <li>Invest without having a clear idea of the potential profitability in the future.</li> </ul>			<i>ER</i>	<ul style="list-style-type: none"> <li>Seek to maximize personal profit.</li> <li>Calculate potential returns/profit in the future based on predictions.</li> <li>Searching for stakeholders to commit necessary funds needed for execution of plan.</li> </ul>		
<b>Stage 2 – Start-up Stage</b>	<i>MO</i>	<ul style="list-style-type: none"> <li>Experiment with what can be achieved with available means.</li> <li>Follow personal preferences when developing the business.</li> <li>Define rough visions of the direction the venture is heading.</li> </ul>			<i>GO</i>	<ul style="list-style-type: none"> <li>Change identity, knowledge and network to align them with the pre-set goal.</li> <li>Acquire resources needed to execute plans.</li> <li>Evaluate planned progress and adapt available means accordingly.</li> </ul>		
	<i>LC</i>	<ul style="list-style-type: none"> <li>Gather, accept and process any unexpected feedback.</li> <li>Change and adapt any pre-made plans made to incorporate contingencies.</li> </ul>			<i>AC</i>	<ul style="list-style-type: none"> <li>Stick to the plans and make only minor adjustment to processes and products.</li> <li>Develop and produce mostly internally, focusing on fulfilling pre-made plans.</li> </ul>		

**Table 2, Effectual and causal dimensions per stage of new venture creation (part 2)**

Stage 2 – Start-up Stage	<i>PC</i>	<ul style="list-style-type: none"> <li>• Welcome other stakeholders to the table, co-creating products and services with stakeholders.</li> <li>• Treat others as potential partners in one way or another.</li> <li>• Openly talk about business ideas, resulting in new impulses.</li> </ul>	<i>CA</i>	<ul style="list-style-type: none"> <li>• Carry out market analysis.</li> <li>• Treat other players in market as competition.</li> <li>• Protect products from competitors, hiding processes from the environment.</li> </ul>
	<i>AL</i>	<ul style="list-style-type: none"> <li>• Invest only what one can afford to lose (monetary and non-monetary investments), not considering potential profitability of investment.</li> <li>• Limit stakeholders' investments to amounts that are uncritical to them.</li> </ul>	<i>ER</i>	<ul style="list-style-type: none"> <li>• Decide how much to invest based on potential profit of investment.</li> <li>• Focus on potential returns rather than on what resources are available in venture when investing.</li> <li>• Search for stakeholders to invest required resources for execution of plans.</li> </ul>
Stage 3 – Establishment stage	<i>MO</i>	<ul style="list-style-type: none"> <li>• Use the changing means available to grow the company in whatever direction.</li> <li>• Follow personal preferences when developing the business.</li> </ul>	<i>GO</i>	<ul style="list-style-type: none"> <li>• Commit to plans and update long-term goals for the future.</li> <li>• Bring any knowledge or resources into company to fulfil future goals.</li> <li>• Evaluate progress on a continuous basis.</li> </ul>
	<i>LC</i>	<ul style="list-style-type: none"> <li>• Deviate from core business activities if new opportunities arise.</li> <li>• Remain flexible by not committing to long-term plans.</li> <li>• Open the company and its processes to the environment</li> </ul>	<i>AC</i>	<ul style="list-style-type: none"> <li>• Carry out plans as defined in cases of unforeseen events.</li> <li>• Do not consider short-term opportunities that are not in long-term plans.</li> <li>• Deal with unforeseen events internally.</li> </ul>
	<i>PC</i>	<ul style="list-style-type: none"> <li>• Expand the number of stakeholders committing to the firm.</li> <li>• Open venture's processes to the environment.</li> </ul>	<i>CA</i>	<ul style="list-style-type: none"> <li>• Conduct systematic market research.</li> <li>• Protect processes and products from competition in the future (patents).</li> </ul>
	<i>AL</i>	<ul style="list-style-type: none"> <li>• Grow organically with small investments</li> <li>• Base investments on resources available within the venture.</li> <li>• Manage growth expectations and ambitions.</li> </ul>	<i>ER</i>	<ul style="list-style-type: none"> <li>• Base investments on potential returns in the future, not on means available in the venture at the time.</li> <li>• Search for stakeholders to invest required resources for execution of plans.</li> <li>• Grow venture in big steps using large investments.</li> </ul>
<p>MO = Means Orientated    GO = Goal Orientated    LC = Leverage Contingencies    AC = Avoid Contingencies  PC = Pre-commitment    CA = Competitive Analysis    AL = Affordable Loss    ER = Expected Returns</p>				

### 3 Methodology

As aforementioned, several scholars have indicated a need for more in-depth studies regarding the drivers behind why entrepreneurs change their decision-making (e.g. Read *et al.*, 2016). The research question of this study focuses on the development of effectual and causal decision-making in new venture creation, and the drivers behind the changes from effectual to causal decision-making or vice versa are explored. In order to answer the research question, this study applies both quantitative as qualitative methods (in line with Reymen *et al.*, 2015; Jiang & Tornikoski, 2018). By analyzing the total amount of effectual and causal decisions taken by entrepreneurs using quantitative methods, patterns in the application of effectual and causal decision-making are explored and changes in entrepreneurial decision-making are identified. In order to better understand why entrepreneurs changed their decision-making, qualitative methods were used to explore why entrepreneurs changed their decision-making strategy. Furthermore, in order to analyze the development of entrepreneurial decision-making over separate points in time, this study adopts a process research approach (Langley, 1999). Process research is particularly well suited for identifying necessary conditions for change (Mohr, 1982). This study attempts to identify the conditions that make entrepreneurs change their decision-making.

#### 3.1 Data sampling

Eleven cases were purposefully selected for this study (Gerring, 2007) using the following criteria: Firstly the influence of any external factors on the decision-making of the entrepreneurs had to be minimized (in line with Chandler *et al.* (2010)). This was done by analyzing entrepreneurs who recently created ventures in the same market, within one nation. Entrepreneurs operating in the same market experience the most comparable external factors influencing their decision-making. The second criteria for selecting the cases was that the selected ventures had to operate in a market that features low-uncertainty.

In order to compare novice and expert entrepreneurs I intentionally selected entrepreneurs varying in entrepreneurial expertise (in line with Fischer & Reuber, 2011). There were three criteria that had to be met by the entrepreneurs included in this study. The first requirement was that the founder of the venture whom the data was retrieved from must still be actively working at the venture (in line with Reymen *et al.*, 2015 and Jiang and Tornikoski, 2018). This ensured that the interviewee was involved in all stages of new venture creation and was able to reflect on all stages of the new venture creation process.

The second requirement was that the income generated by the venture had to be the primary source of income for the entrepreneur. Entrepreneurs who created ventures for other reasons than profit are not included since their dependency on the venture is not comparable to entrepreneurs who depend on the success of their ventures, which potentially influences their decision-making.

Thirdly, the entrepreneurs included in this study must have founded their venture between 2011 and 2016. This helps to reduce the differences in the environmental challenges faced by the entrepreneurs. Furthermore, retrospective bias is reduced by excluding entrepreneurs who founded businesses before 2011. Ventures that were founded after 2016 are excluded since these ventures have not been existing long enough, making a thorough analyze at least two stages of new venture creation problematic.

The sample used in this study included eleven ventures based across six provinces of the Netherlands. Out of the eleven entrepreneurs, the sample consisted of seven novices and four experts (table three). None of the seven novice entrepreneurs had any experience of running a different venture before starting the venture being studied.

**Table 3, Sample description**

<b>Venture</b>	<b>Founded</b>	<b>Novice or Expert</b>	<b>Continuous Activities (excluding one-time events, such as festivals)</b>
Venture A	2015	Novice	Brewing beer
Venture B	2013	Novice	Brewing beer
Venture C	2011	Novice	Brewing beer, taproom, beer shop
Venture D	2014	Novice	Brewing beer
Venture E	2016	Novice	Brewing beer, beer shop
Venture F	2015	Novice	Brewing beer
Venture G	2013	Novice	Brewing beer, taproom
Venture H	2014	Expert	Brewing beer
Venture I	2015	Expert	Brewing beer, taproom
Venture J	2012	Expert	Brewing beer, taproom, beer shop
Venture K	2016	Expert	Brewing beer, taproom

3.1.1 Dutch craft-breweries

The Dutch craft-brewery industry meets the requirements mentioned chapter 3.1, and is a market with low-uncertainty. The entrepreneurs included in this study perceived the development of Dutch craft beer market as predictable, since they predicted the future development of the Dutch craft-beer

market by looking at the developments of the American craft beer market. Furthermore, challenges faced by craft-brewers in the Netherlands are rather comparable. Thus, Dutch entrepreneurs creating craft-breweries are well-suited for this study.

A craft-brewery is defined as “an independent brewing organization established after 1980 that produces beer according to its own recipes ... at relatively small scale (<25,000 hl per year)” (Van Dijk *et al.*, 2017, p.7). The Dutch craft-beer industry has been growing remarkably. Van Dijk *et al.* (2017) illustrated how the number of craft-breweries in the Netherlands grew from merely 13 in 1980, to 73 in 2003 and 390 in 2015. The number of active craft breweries grew to 538 as of May 5, 2018 (Biernet, 2018). The dramatic rise in the number of entrepreneurs operating within the Craft-brewery industry offers the chance to study a large group of entrepreneurs who entered a market with similar uncertainties, challenges and opportunities.

### 3.2 Data collection

This study adopted a single study design in order to gain more insights into determining factors shaping decision-making processes within venture creation. Semi-structured interviews were conducted to gather the data.

#### 3.2.1 Semi-structured interviews

Semi-structured interviews are well suited for exploring attitudes, values, beliefs and motives (RAND, 2009) and best used when conducting small-scale research (Drever, 1995). Furthermore, semi-structured interviews provide the interviewer with some freedom to explore certain phenomena described by the interviewee and thus create more distinct data (Yin, 2003). The structure of the interviews used in this study roughly consisted of three parts (Appendix II), but small deviations from this structure occurred. The first part focused on how the entrepreneur assessed the opportunity to start a craft brewery. The second part focused on the first two years of the venture and the third part focused on events after the first two years of the venture’s lifespan. Interviewees were asked roughly the same questions, providing an overall guiding framework that facilitates easier analysis.

Entrepreneurs within the Dutch craft-brewery industry were contacted and requested to participate in an interview. Prior to contacting the entrepreneurs, an initial check was used to rule out entrepreneurs that did not meet the sampling criteria. Thirty-two breweries were contacted, of which twelve breweries were willing to participate in this study. One interview was subsequently excluded from the research for it did not provide enough usable data. All interviews were conducted face to face, in or around the workspace of the interviewee. The synchronous communication triggered more spontaneous responses of the interviewee (Opdenakker, 2006).

By briefly discussing the interview after it took place with the interviewee, the confirmation bias was reduced. The interviews lasted between 40 to 75 minutes and were transcribed within 24 hours after the interview took place. Any references to names, cities, people and companies mentioned in the interview were anonymized. In some cases, an additional email was sent to gather pieces of missing data.

### 3.3 Analysis

The conceptual framework created in section 2.4 forms the basis of a quantitative analysis. The framework allowed entrepreneurial decision-making to be coded as effectual, causal, or both. There were two ways this study coded entrepreneurial decision-making. Firstly, I followed the procedure of identifying *decision events* (in line with Reymen *et al.* (2015) and Jain and Sharma (2013)). This method was developed by Van de Ven and Poole (1990) and Poole *et al.* (2000). Decision events are defined as 'actions or decisions taken by the entrepreneur for creating the venture' (Reymen *et al.*, 2015, p. 359). Examples of decision events are conducting market research, involving stakeholders in the production process and involving customers in new product development. Decisions taken by other stakeholders, such as employees, were excluded from the research. Furthermore, the decisions taken had to have potential impact on the creation of the new venture to ensure that no insignificant decisions impacted the results. The second way I coded entrepreneurial decision-making was by including the intentions of entrepreneurs for future decisions (in line with Jiang & Tornikoski (2018)). This greatly enlarged the amount of data that could be analyzed. These intentions will be referred to as decision intentions.

Next, I placed the decision intentions or events in one of the three stages of new venture creation. Due to the reliance on retrospective data, the placement of decision events and intentions in the right stage of new venture creation could contain small mistakes. However, the sample used in this study consisted of entrepreneurs creating venture rather recently and therefore the reliance on retrospective data does not directly impact the main findings of this study.

In a next step, I identified to what extent the decision events and intentions were effectual or causal. Similar to Reymen *et al.* (2015) and Chandler *et al.* (2011), effectuation and causation were treated as independent constructs in order to assess if effectuation and causation are co-occurring. This study differentiates effectuation and causation on four dimensions. Every decision event and intention was compared with the empirical indicators in table 2, and coded as effectual, causal or both. Decision events and intentions could match with more than one dimension and could simultaneously match with both effectual and causal dimensions. Every dimension of effectuation that was matched with a decision event or intention was coded as one effectual point and vice versa for causal dimensions. Since there are four dimensions, a decision event could range from 0 to 4 dimensions for both effectuation and causation. One illustrative example of how a decision event was coded is Venture E.

Venture E had the goal of brewing bigger batches one year after the venture was created. The entrepreneur decided to actively search for an investor that could help him to finance larger batches and additionally bring financial expertise into his venture by making this investor a partner. This decision was coded as goal-orientated, for the entrepreneur needed to change the resources available to his venture to reach a pre-set goal. The decision to find the necessary financing for the execution of a plan is also coded as expected returns. Furthermore, because the entrepreneur was looking for an investor who would commit his expertise to the firm, thus this decision was also coded as pre-commitment. The result of this decision in the coding is hence two causal dimensions and one effectual dimension. This assessment was done for all decisions taken, revisiting classifications to double-check if the initial analysis was correct.

The quantitative data generated by analysing the business decisions should be interpreted with caution. Even though the coding of the decisions taken by entrepreneurs was checked by an effectuation expert, coding strategic decision-making based on interviews is a complicated process.

## 4 Results

This chapter includes the quantitative analysis needed to answer the first part of the research question: *How does the use of effectual and causal decision-making evolve during the venture creation process in low-technology firms?*

### 4.1 Quantitative analysis

**Table 4, coded effectual and causal dimensions per stage of new venture creation**

	Effectual Dimensions						Causal Dimensions					
	<i>MO</i>	<i>LC</i>	<i>PC</i>	<i>AL</i>	<i>Tot Eff</i>	<i>Tot Per</i>	<i>GO</i>	<i>AC</i>	<i>CA</i>	<i>ER</i>	<i>Tot Cau</i>	<i>Tot Per</i>
<b>Stage 1</b>	13	2	7	6	28	27%	11	4	6	7	27	24%
<b>Stage 2</b>	17	6	13	4	40	38%	10	3	10	8	31	27%
<b>Stage 3</b>	7	8	16	5	36	35%	15	14	18	10	55	49%
<b>Total</b>	37	16	36	15	104	100%	36	21	34	25	116	100%

Table four presents the results of the scores per dimension of new venture creation. In total, 220 decision events/intentions were coded. The data analysis provided insight in how the entrepreneurs developed their decision-making. Two findings are worth mentioning. Firstly, entrepreneurs relied slightly more on effectual decision-making in the first two stages of new venture creation, but in the third stage, entrepreneurs relied more on causal decision-making.

The second finding is that the results show that all ventures used both effectual and causal dimensions in the creation of their ventures with the exception of venture K (see table 5). Moreover, all ventures with the exception of venture D and K took at least one decision that was connected to both effectual and causal decisions. This indicates that entrepreneurs use both effectuation and causation in the development of their firms.



**Table 5, Analysis of cross-case variation**

Venture	Novice or Expert	Number of effectuation dimensions coded	Number of causation dimensions coded	Difference # effectuation and # causation dimensions coded
Venture A	Novice	11	8	3
Venture B	Novice	11	13	-2
Venture C	Novice	10	18	-8
Venture D	Novice	10	11	-1
Venture E	Novice	11	11	0
Venture F	Novice	8	5	3
Venture G	Novice	10	13	-3
Venture H	Expert	14	2	12
Venture I	Expert	10	5	5
Venture J	Expert	10	13	-3
Venture K	Expert	0	16	-16
<i>Average</i>	All	9.46	10.46	-0.91
<i>Average</i>	Novice	10.14	11.29	-1.14
<i>Average</i>	Expert	8.5	9	-0.5

#### 4.2 Experts and novices

Next, the difference between experts and novices was examined. Tables six displays the coded decision events/intentions separated for novice and expert entrepreneurs. Novice entrepreneurs mixed effectual and causal decision-making in the opportunity assessment stage, applied more effectual decision-making in the start-up stage, and switched to more causal decision-making in the establishment stage. Especially the difference between the second and the third stage is noticeable.

**Table 6, Novices coded effectual and causal dimensions per stage of new venture creation**

	Novice Entrepreneurs				Expert entrepreneurs			
	<i>Effectual Dimensions</i>		<i>Causal Dimensions</i>		<i>Effectual Dimensions</i>		<i>Causal Dimensions</i>	
<b>Stage 1</b>	19	27%	18	23%	9	27%	10	27%
<b>Stage 2</b>	30	42%	19	24%	10	30%	12	32%
<b>Stage 3</b>	22	31%	42	53%	14	42%	15	41%
	71	100%	79	100%	33	100%	37	100%

This is in contrast with expert entrepreneurs, who according to the results of this study are less likely to change their decision-making when moving to other stages. This suggests that expert entrepreneurs tend to stick to a decision model whereas novice entrepreneurs change their decision-making. The drivers behind changes from effectual to causal decision-making and vice versa are discussed in more detail in chapter five.

4.3 Analysis per stage of new venture creation

The next step in analysing the data was to examine what dimensions are most important in each stage of new venture creation.

4.3.1 Opportunity Assessment Stage

**Table 7, Dimensions of Stage 1**

	Effectual Dimensions					Causal Dimensions				
	<i>MO</i>	<i>LC</i>	<i>PC</i>	<i>AL</i>	<i>Tot Eff</i>	<i>GO</i>	<i>AC</i>	<i>CA</i>	<i>ER</i>	<i>Tot Cau</i>
<b>Stage 1</b>	13	2	7	6	28	11	4	6	7	27

4.3.1.1 Effectual dimensions

The dimension means-orientated was the most coded effectual dimension in the opportunity assessment stage (table 7). The high score for means-orientated can be explained by two factors. The first factor is that a lot of the entrepreneurs assessed the possibility to start a venture with the means available to them (identity, knowledge, network). Seven out of the eleven entrepreneurs already had brewing experience prior to the assessment of the opportunity to start a brewery. Most entrepreneurs thus assessed what could be created with their set of means. Venture H is a good example of a venture that assessed the opportunity by looking at what could be achieved with the means available to them: “We (friends) brew beer as a hobby at first without any ambition to start a venture, I was a tax specialist. But people liked our beer and then we thought that it would be fun to start a brewery ... we continued the hobby and it became bigger and bigger.”

The second factor explaining the importance of the means-orientated dimension is that entrepreneurs illustrated that they wanted to start a brewery because it is in line with their personal preferences; the entrepreneurs really liked the idea of owning a brewery and creating new types of beer. Venture D illustrates this: “I started with a group of students. One of them became my future business partner. We both wanted to express our creativity in products and started to experiment with beer in 2012. In 2014, we created a company.”

#### 4.3.1.2 Causal dimensions

The causal dimension that sticks out in the opportunity assessment stage is goal-orientated. The goal orientation factor when assessing the opportunity was primarily concerned with the creation of future goals. This was often represented by a business plan or forecasting model, as was the case for six ventures. The business plans included market analysis and competitive positioning, but varied in how thorough those analysis were. Venture C clarified their approach: “the business plan had an analysis of our business environment, the beer market, included worst-case scenarios, liquidity forecasts, the choice of beers and why, market development. It was a real business plan ... we created goals for five years and set goals for even longer term.”

Furthermore, five ventures discussed the opportunity with professionals, either from within or outside their personal network. The entrepreneur of venture K pointed out that they thoroughly reviewed the opportunity: “we discussed the opportunity with a shareholder of a large brewery, a financial expert, a concept expert, an engineer; we created an entire project team.”

The interviews clarified that entrepreneurs sometimes only created business plans and forecasting models for attracting investment, as way the case for venture G: “I believed that starting a brewery was a good idea. Eventually, to attract finance, we wrote a business plan for the people that wanted to invest money in the brewery. Honestly, I had not thought of writing one myself, it was only created to convince others that starting a brewery was a good idea.” The ventures most commonly used bank loans and crowdfunding campaigns to acquire the needed finance.

#### 4.3.2 Start-up Stage

**Table 8, Dimensions of Stage 2**

	Effectual Dimensions					Causal Dimensions				
	<i>MO</i>	<i>LC</i>	<i>PC</i>	<i>AL</i>	<i>Tot Eff</i>	<i>GO</i>	<i>AC</i>	<i>CA</i>	<i>ER</i>	<i>Tot Cau</i>
<b>Stage 2</b>	17	6	13	4	40	10	3	10	8	31

##### 4.3.2.1 Effectual dimensions

In the start-up stage, the focus on means-orientation and partnerships were very noticeable effectual dimensions. The means-orientation dimension consisted mostly of entrepreneurs following their personal preferences in the venture development. This is best represented by the fact that all ventures except for venture I and K followed their personal preferences when developing their products, rather than producing what the market demanded for the most. For example, venture B did not conduct market research: “We choose to make what we liked ourselves. It was basically just brewing beer like before it was an official venture, but in bigger batches”.

The pre-commitment dimension was mostly reflected by entrepreneurs treating other players in the market as potential partners, rather than competition. The craft-breweries also frequently partnered up with other breweries to create new products (referred to as collaborations), and to share knowledge. The interviews indicated that many entrepreneurs viewed other craft-brewers as brothers in arms who together were creating the craft-beer market and stood up against the dominant big breweries such as Heineken. Venture D, as many other ventures, sought to increase the level of the entire craft-beer market: "When a consumer has a bad experience with craft-beer, he will go back to ordering pilsner (mass-produced beer). I want to invest time and effort in increasing the quality of all craft-breweries by sharing knowledge."

#### *4.3.2.2 Causal dimensions*

The two most important causal dimensions in the second stage were goal-orientation and competitive analysis. The goal orientation was represented by entrepreneurs acquiring the resources needed to execute their plans. More than half the entrepreneurs acquired external investments, such as venture E: "at a certain point we grew so hard we needed to brew bigger batches. During 2017 we had to invest a lot without generating a lot of revenue. You need to go through that period in order to grow. That is why we were looking for investments."

As well as attracting finance, ventures enhanced their knowledge by partnering up with other ventures, or by hiring new employees. Venture D chose to do the latter: "We did not have any experience in communication. We could not present what we did here in a good way, so we hired somebody. There is a good story behind the brewery and we needed somebody to tell that story."

The start-up stage also featured increasing competitive analysis, mostly conducted in the form of market research. Five out of the eleven ventures started to produce beers that were chosen according to market research. However, the market research was often combined with personal preferences. Venture A, who did conduct market research, decided to produce the beers they themselves liked the best and also fitted the market requirements: "we could have six beers that we want to produce some time, then we look at what is currently at the market. When IPA (beer style) was very popular, we made an IPA. Eventually, our own preference is the decisive factor. But it is interesting to consider how the market developments influence your personal preferences."

### 4.3.3 Establishment stage

**Table 9, Dimensions of Stage 3**

	Effectual Dimensions					Causal Dimensions				
	<i>MO</i>	<i>LC</i>	<i>PC</i>	<i>AL</i>	<i>Tot Eff</i>	<i>GO</i>	<i>AC</i>	<i>CA</i>	<i>ER</i>	<i>Tot Cau</i>
<b>Stage 3</b>	7	8	16	5	36	15	14	18	10	55

#### 4.3.3.1 Effectual dimensions

The establishment stage featured a decline in effectual decisions-making. This was most prominent for decisions-making in line with personal preference. A good example of this is venture B, who used to develop the venture according to personal preferences in the first two stages. The entrepreneur stated that the biggest change in the decision-making of the third stage compared to the first two stages was that decisions taken were more market driven. After attracting investors, the stakes of decisions got higher and the entrepreneur felt that the best way to make decisions was by applying more causal methods, such as market analysis, rather than following personal preferences.

The effectual dimension that remained very noticeable is the pre-commitment dimension. This was mostly due to most entrepreneurs regarding other craft-brewers as potential partners. This was illustrated by a high number of collaborations of the craft-brewers with other craft brewers. Venture A is one example: ‘collaborations with other breweries strengthen both sides ... we have many good contacts within the craft-brewery industry, for we are in this industry together.’

#### 4.3.3.2 Causal dimensions

The most important causal decisions in the establishment stage were competitive analysis and avoiding contingencies. In contrast with the previous two stages, entrepreneurs were more likely to indicate that they did not want to deviate from pre-made plans. It is logical that the avoiding contingencies dimension is more visible in the last stage since entrepreneurs stick to pre-made plans after the plans are made in earlier stages.

The competitive analysis dimension is mostly explained by ventures doing more market research, where before they mostly followed personal preferences. Every venture, with the exception of venture F, conducted market research of some sort and started to make more decisions based on market analysis rather than on personal preferences. A good example of this is venture B, of which the entrepreneurs did not like the popular Belgian style beer. Hence, they did not produce Belgian style beers in the start-up stage. However, in the establishment stage they needed to increase their revenue, and choose to start producing Belgian beer.

Furthermore, some ventures started to hide production processes from the environment. Venture B, after successfully mastering a difficult technique to produce low-alcoholic beer, became secretive about the process of production whereas before, they had always been very open about their processes. Venture C also changed their view on other breweries from potential partners to a more competitive view: "in the beginning we (craft-breweries) wanted to create a new world and promote it together. But I realize some craft-breweries are in this for the money, others are smaller and have more passion for beer. There are many different types of breweries, but the beer world is getting tough ... everyone is fighting for their existence and offers bars and cafes good deals to get other breweries off the tap. This is a threat, and we have to deal with this."

4.4 Summary

Table 10 provides an overview of the most important dimensions per stage of new venture creation, supported by quotes of entrepreneurs. The number standing behind the dimension indicate the amount of venture that had at least one decision event/intention coded for that dimension. For example, eight of the eleven ventures made at least one decision that was coded as Means Orientated in the first stage. The quotes illustrate examples from the ventures analysed.

**Table 10, Most coded dimensions per stage (part 1)**

MO = Means Orientated		GO = Goal Orientated		LC = Leverage Contingencies		AC = Avoid Contingencies				
PC = Pre-Commitment		CA = Competitive Analysis		AL = Affordable Loss		ER = Expected Returns				
<b>Stage 1 – Opportunity Assessment Stage</b>	<b>Effectuation</b>			<b>Causation</b>						
	<i>MO</i> (8/11)	<i>Venture B: 'We were home brewing since 2010 and fantasized about having a venture. We could do everything ourselves. My partners studied business administration and was a good designer. I could build a website and those are the most specialist things you need in the beginning.'</i>			<i>GO</i> (8/11)	<i>Venture G: "Everything a business plan needed was in it. Market research, forecast, the beer world we are in, the competition, it basically had all a business plan needed. We stated that we wanted to sell beer outdoors, to start an own brewery when the financial situation allows it. It also stated that we wanted to open more brewpubs. The scope was about five years."</i>				
	<i>AL</i> (5/11)	<i>Venture A: "if things go wrong, this will just cost us an expensive holiday."</i>			<i>CA</i> (5/11)	<i>"Venture A: We made a small business plan, including vision, strategy and a SWOT analysis. We did market research, but very pragmatic."</i>				
	<i>P</i> (7/11)	<i>Venture C: "I told my friends, one was working in a café and the other was a brewer, that we could start a brewery and that I needed them."</i>			<i>ER</i> (6/11)	<i>Venture J: "In order to attract external finance, I created a model with an accountant forecasting five years. We checked how the liquidity would be and if building a brewery was financially attractive."</i>				

**Table 10, Most coded dimensions per stage (part 2)**

Stage 2 – Start-up Stage	MO (9/11)	Venture C: “in the beginning we mainly looked at our personal preferences and not at the market. We used our own reference point and choose to make a saison instead of a Belgian or German beer... We also made seasonal beers and every month we created a special. That’s how we choose our portfolio.”	GO (6/11)	Venture D: ‘we did not have experience in communication, so we hired someone for that. ... We also let an accountant advise us on our liquidity. We had invested €400.000, and needed things to go well.’
	P (8/11)	Venture E: “before we put our beer on the market, we had a tasting session with our regular customers. Their feedback is processed in the beers.”	CA (7/11)	Venture A: “we looked at what was available in the market as well as what we are interested in ourselves. We try to do something with that. It is interesting to ask yourself to what extent the market influences what you are interested, it certainly does play a part.”
Stage 3 – Establishment stage	P (9/11)	<p>Venture D: “When a consumer has a bad experience with craft-beer, he will go back to ordering pilsner, or Leffe. I want to invest time and effort in increasing the quality of all craft-breweries by sharing knowledge.”</p> <p>Venture E: “when looking at collaborations, we (breweries) strengthen each other. We have very good contact with the other craft-brewers.”</p>	AC (6/11)	<p>Venture C: I always see possibilities and chances and I am enthusiastic about those opportunities. But those opportunities are not in my three-year plan. So I won’t pursue them, I keep it stupid and simple.</p> <p>Venture K: “We do not deviate from the plans except for some minor details.”</p>
			CA (8/11)	<p>Venture B: “We now determine what new beer we make according to market analysis. We look at what is trendy, things are market driven ... We are pretty secretive about one of our beers, for we invested two years to make it and the market is booming, so we have an advantage over the others. We are very open about the other beers.”</p> <p>Venture C: “We used to brew for other breweries to increase the level of Dutch craft-breweries. But in that way, you also create your own competition, and you have to take that into account.”</p>
<p>MO = Means Orientated      GO = Goal Orientated      LC = Leverage Contingencies      AC = Avoid Contingencies</p> <p>PC = Pre-commitment      CA = Competitive Analysis      AL = Affordable Loss      ER = Expected Returns</p>				

## 5 Turning Points

In order to identify what ventures changed their decision-making from effectual to causal or vice versa, a number indicating the difference between effectual and causal decision-making was created for each stage of new venture creation. This was done by counting the number of effectual and causal dimensions for each stage of new venture creation. The change between the stages of new venture creation was calculated. A change from effectual to causal decision-making is highlighted by the colour red, a change from causal to effectual decision-making is highlighted by the colour blue (table 11).

**Table 11, Difference between effectual and causal decision-making across stages**

Red = change from effectual to causal decision-making    Blue = change from causal to effectual decision-making			
Venture	<i>Novice or Expert</i>	<i>Change between stage 1 and 2</i>	<i>Change between stage 2 and 3</i>
Venture A	Novice	5	4
Venture B	Novice	2	18
Venture C	Novice	7	10
Venture D	Novice	7	4
Venture E	Novice	0	0
Venture F	Novice	0	3
Venture G	Novice	3	6
Venture H	Expert	0	0
Venture I	Expert	2	3
Venture J	Expert	1	6
Venture K	Expert	1	4
Average	Novice	3.4	6.4
Average	Expert	1.0	3.3

In the start-up stage, entrepreneurs switched more from causal to effectual decision-making than vice versa. In contrast, entrepreneurs switched more from effectual to causal decision-making after entering the establishment stage. Furthermore, the most significant shifts in decision-making were made between the second and the third stage. This is mostly represented by venture B and C, who changed from effectual to causal decision-making.

There also was a big difference between experts and novices. With the exception of venture J, all large changes in decision-making were made by novice entrepreneurs. In general, novice entrepreneurs were more likely to change their decision-making than expert entrepreneurs. Moreover, the largest changes in decision-making logic were made by novices. The results therefore suggests that experts seem to be more constant in their decision-making than novices.



## 5.1 Switches between stage 1 and 2

### 5.1.1 Switch from effectual to causal

Switching from effectually assessing an opportunity to causal decision-making in the start-up stage was not frequently observed. Only venture D (novice) switched from effectual assessment of the opportunity to causal decision-making. The entrepreneurs realised that their venture needed to heavily increase their sales numbers in order to realize a viable business model. The solution was to expand the venture's capacity by constructing a brewery. As in many other cases, the entrepreneurs needed to attract additional finance and thus wrote a business plan to convince a bank to loan them the required funds. There is a visible pattern that when ventures need to attract external finance, they tend to apply more causal decision-making.

### 5.1.2 Switch from causal to effectual

Entrepreneurs switched more from causal opportunity assessment to effectual decision-making than vice versa. The first noticeable phenomenon in this change is that some entrepreneurs only relied on causal opportunity assessment methods because they needed to attract finance and therefore had to create a business plan. The causal methods were only applied in the opportunity assessment stage because the institutions that provide financial assistance to new ventures ask for documents with predictions of the future. Once the venture acquired the needed finance, the entrepreneurs did not follow the created plans.

Secondly, the high demand for craft-beers allowed entrepreneurs to follow their personal preferences. Venture C indicated that they used to experiment with a lot of different products: "In 2011, there were roughly 100 breweries in the Netherlands. The demand for local beers was rising very fast, so we could sell anything. We could walk into a bar with a beer made with coffee, or a Halloween pumpkin beer, and we would easily sell it." The market circumstances allowed entrepreneur to deviate from the product range as stated in the business plan and apply the effectual logic of following personal preferences.

## 5.2 Switches between stage 2 and 3

A switch from causal decision-making in the start-up stage to effectual decision-making in the effectual stage was not observed in this study, hence there is only one subsection.

### 5.2.1 Switch from effectual to causal

The switch from effectual decision-making in the start-up stage to causal decision-making in the establishment stage was the most observed shift in the decision-making strategy. Especially novice entrepreneurs switched to more causal decision-making as their ventures were challenged by certain

situations. They wanted to regain control over those situations by applying more causal decision-making. Two examples illustrate this.

Venture B shifted from having almost pure effectual decision-making in the first two stages of new venture creation to causal decision-making in the third stage. During the first two years, the entrepreneurs did not feel the urge to create a business plan, for “the worst thing that can happen is that we have less money and a lot of beer.” This changed at the point the venture signed a contract that required them to pay monthly fixed costs: ‘until then we did not have any obligations, if we would not sell anything for a month that would not matter. The moment you agree to fixed costs you have to sell enough to be able to run the venture.’ The entrepreneurs decided to create more longer-term plans that would increase their chances of creating sufficient sales. More market analysis was conducted and beers were no longer created according to personal preferences but according to market demands. Next, the entrepreneurs drafted a business plan to attract finance so they could build their own brewing installation. This business plan became very important for the entrepreneurs, who started to work according to the business plan: “we have to make a living out of this. ... Things are more market-driven now, we look at what currently is in demand. We make more business case like calculation, for the numbers we play with have way higher consequences, we want to make the right choices. The stakes are way higher, even though we still make some decision on gut feeling.”

The example of venture B highlights how the decision-making shifted from decisions based on gut feeling to more causal decisions when the venture had to deal with fixed costs and more people (investors, employees) depending on the firm. The entrepreneurs thought that the best way to ensure a steady revenue was to rely on causal methods. Venture J shows a similar pattern. The venture combined causal with effectual decision-making in the first two stages. The venture specialized in creating extreme beers that were in line with personal preferences. However, the venture ran into liquidity problems in the establishment stage. The venture needed to increase their sales, and turned to more causal decision-making: “2016 was a financial disaster ... We could see that there was a great need for more volume ... We decided to partner up with a venture that would sell beer for us. But they will not do that with twenty-six of your beers, but with two. So we made our beers more accessible, purely so we could pay the bills. The market dictates what we create, as was the case when we created a Weizen (a German-style beer).” Furthermore, KPI’s were created for several departments in the venture. The venture also started to strictly work according to the plans and preferable would not deviate from their pre-set goals: ‘I have a very clear goal. First we need to get financially healthy, so our target is purely based on volume. Those are the targets.’

### 5.3 Summary of turning points

In general, expert entrepreneurs changed their decision-making logic from effectual to causal or vice versa less often than novices as their ventures matured. Novice entrepreneurs were inclined to move from causal to effectual decision-making as they moved from the opportunity assessment stage to the start-up stage, and from effectual to causal decision-making when moving from the start-up stage to the establishment stage. Switches from causal to effectual decision-making as ventures moved from the first to the second stage can generally be explained by ventures following their personal preferences after they started to develop their firms. Previous research highlights that entrepreneurs start their firms with passion (Cardon, *et al.*, 2009) and belief in their opportunities (Mullins and Komisar, 2009). This could explain why entrepreneurs mostly followed their personal preferences in the beginning of the venture rather than to stick to any pre-made plans. Novice entrepreneurs mostly applied causal methods in the first stage in order to receive financial resources. After these resources were gathered, the entrepreneurs no longer needed to apply causal methods and applied more effectual methods.

It was most frequently observed that novice entrepreneurs switched from effectual to causal decision-making as they moved from the start-up stage to the establishment stage. This can generally be explained by novice entrepreneurs no longer feeling in control of situations by relying on effectual methods, and therefore changing their decision-making to more planning based methods. The interviews indicated that novice entrepreneurs did not want to make decisions based on gut feeling and wanted to regain control of a difficult situation by relying more on pre-made plans based on predicting the future developments of the market. This is in contrast with expert entrepreneurs, who faced similar challenges as novices but did not change their decision-making logic.

## 6 Reflection

This study was conducted in order to answer the following research question: *(1) How does the use of effectual and causal decision-making evolve during the venture creation process in low-technology firms? And (2) what may drive shifts in the use of effectual and causal decision-making?* The analysis of the results yields the following answer: Entrepreneurs mix effectual and causal methods, even when the environment they operate in has low-uncertainty. Effectuation is believed to be best applied in situations with high uncertainty, but seems to also play a role in low-uncertainty new venture creation. This is mostly represented by entrepreneurs following personal preferences in the venture's early years and by considering other market players as potential partners. Causation also plays a role, initially with entrepreneurs setting goals when assessing the opportunity to start a venture. After ventures existed for several years, entrepreneurs increasingly applied competitive analysis and made more planning-based decisions.

Another findings of this study is that there seems to be a difference between how novice and expert entrepreneurs develop their decision-making strategies. Novice entrepreneurs mix causal and effectual decision-making strategies when assessing the opportunity to start a venture. In the start-up stage, they mostly apply effectual methods, seeking to align the developments of the venture with their personal preferences. As the venture moves to the establishment stage the entrepreneurs start to apply more causal methods, such as relying on premade plans and conducting market analysis. The change from effectual to causal decision-making is triggered by a need to regain control over situations that are challenging. Novices tend to rely on more planned-based decision-making to perceive they are in control. In contrast with novices, expert entrepreneurs apply a mix of both causal and effectual decision-making throughout the new venture creation process, without indicating a clear shift in the decision-making logic. This suggests that as entrepreneurs become more experienced with running a venture, they are less likely to change their decision-making logic as their venture matures. Another condition that drives entrepreneurs to change their decision-making strategy is when entrepreneurs are unable to gather enough financial resources they need to develop their ventures. Causal methods, such as creating business plans, are then applied in order to attract finance from external investors such as banks and crowdfunding campaigns.

## 6.1 Reflection Conceptual Framework

Conceptual frameworks are often revisited and completed after the data was gathered and analysed (Yin, 2003). Revisiting the conceptual framework constructed in chapter 2.4 provides a clear overview of (a) the dimensions that were most important and (b) the characteristics of these dimensions. Table 12 provides an overview of the dimensions that were most commonly applied by entrepreneurs creating craft-breweries. This framework could be used in future research aimed at analysing the role of effectuation in low-uncertainty new venture creation to verify if an analysis in other low-uncertainty industries yields similar results. Furthermore, the framework could be compared with future research in high-uncertainty new venture creation to identify what are the main differences between high- and low- uncertainty new venture creation. The three stages of new venture creation that characterize the model are individually discussed in the following three paragraphs.

### 6.1.1 Opportunity Assessment stage

The opportunity assessment stage consisted of a strong focus on assessing what could be created with the available means. Most entrepreneurs were already able to brew before they created a craft-beer venture (knowledge). All entrepreneurs were also creating products that they personally affiliated with (identity). Furthermore, it was very common for entrepreneurs to involve friends and family in the opportunity assessment to strengthen the entrepreneurial team (network). These are the three categories of means that entrepreneurs start the effectual process with (Saravathy, 2001; Wiltbank *et al.*, 2006). A second effectual dimension that was frequently observed was the affordable loss dimension. Entrepreneurs who started the venture with their own resources only invested what they could afford to lose and did not start the business with clear ideas of future profitability, which is in line with effectuation theory (Dew *et al.*, 2009a; Saravathy, 2001). Finally, partners were often included early on in the process.

Some entrepreneurs managed to start a craft-brewery by relying on their savings, but others who did not have the minimal finance necessary to start a craft-brewery needed to attract external finance. If these entrepreneurs are unable to find funds in their personal network, they need to go to a bank, which forces them to apply causal methods. Causal opportunity assessment mostly was concerned with the creation of a business plan, which included goal setting and competitive analysis. This supports Arend *et al.*, (2015) in their claim that not all entrepreneurs can be effectuators, since entrepreneurs need to have the financial means, or a network that can support them financially, to start a new venture.

**Table 12, Revisited conceptual framework**

MO = Means Orientated    GO = Goal Orientated    LC = Leverage Contingencies    AC = Avoid Contingencies				
PC = Pre-commitment    CA = Competitive Analysis    AL = Affordable Loss    ER = Expected Returns				
<b>Stage 1 – Opportunity Assessment Stage</b>	<b>Effectuation</b>		<b>Causation</b>	
	<i>MO</i>	<ul style="list-style-type: none"> <li>Assess what can be created with current identity, knowledge and network.</li> <li>Build on existing network of contacts to discuss and assess opportunities.</li> </ul>	<i>GO</i>	<ul style="list-style-type: none"> <li>Define goals with a scope of three to five years.</li> <li>Search for experts to discuss and assess opportunities.</li> </ul>
	<i>PC</i>	<ul style="list-style-type: none"> <li>Involve people and companies within personal network in assessing the opportunity.</li> </ul>	<i>CA</i>	<ul style="list-style-type: none"> <li>Carry out market analysis and competitive positioning.</li> </ul>
	<i>AL</i>	<ul style="list-style-type: none"> <li>Base assessment of opportunity on what can be achieved with time and personal savings.</li> <li>Invest without having a clear idea of the potential profitability in the future.</li> </ul>	<i>ER</i>	<ul style="list-style-type: none"> <li>Search for investments from banks and crowdfunding campaigns to acquire the resources needed.</li> </ul>
<b>Stage 2 – Start-up Stage</b>	<i>MO</i>	<ul style="list-style-type: none"> <li>Follow personal preferences when developing the business.</li> </ul>	<i>GO</i>	<ul style="list-style-type: none"> <li>Acquire resources needed to execute plans using banks and crowdfunding campaigns.</li> </ul>
	<i>PC</i>	<ul style="list-style-type: none"> <li>Co-create products with other players in market.</li> <li>Share knowledge with other players in market.</li> </ul>	<i>CA</i>	<ul style="list-style-type: none"> <li>Carry out market analysis to identify market developments.</li> </ul>
<b>Stage 3 – Establishment stage</b>	<i>PC</i>	<ul style="list-style-type: none"> <li>Co-create products with other players in market.</li> <li>Share knowledge with other players in market.</li> </ul>	<i>AC</i>	<ul style="list-style-type: none"> <li>Carry out plans as defined in business plans and other pre-made plans.</li> </ul>
			<i>CA</i>	<ul style="list-style-type: none"> <li>Conduct systematic market research, focusing on market developments.</li> <li>Hide certain processes and products from competition.</li> </ul>

### 6.1.2 Start-up stage

In the start-up stage, almost all entrepreneurs created products that were in line with their personal preferences. Entrepreneurs often started their firms creating the products that they already created before and personally liked the most. Furthermore, they indicated that even though they knew the market required a certain product, they would focus on producing products that were in line with their personal preferences. Following personal preference seems to play a very significant part in especially

the start-up stage and entrepreneurs seem to initially have a strong urgency to create a venture that they wanted to create, which is in line with the theory of effectuation Sarasvathy (2001). Additionally, ventures often worked together with other players in the market, co-creating and sharing knowledge. The focus on partnerships could be due to craft-brewers feeling very connected to other craft-brewers, and future research could verify if a similar focus on partnerships is found in other industries.

Causal decision-making in the start-up stage was mostly represented by the dimension goal-orientated, for most entrepreneurs who assessed the opportunity by creating a business plan in the first stage acquired the resources to start their venture in the start-up stage. Additionally, entrepreneurs conducted market research on the developments of the market, rather than considering other players in the market as competitors. The causal dimension of competitive analysis roughly consists of two components, namely market research and treating others as competition (Alsos *et al.*, 2014; Sarasvathy, 2001; Chandler *et al.*, 2010; Fisher, 2012). The entrepreneurs included in this study did conduct market research, but considered other players in the market as potential partners, not as competition. This is a good example of why doing more qualitative research in the field of effectuation makes sense, since studies that only create quantitative scores per dimension would not highlight that finding.

### 6.1.3 Establishment stage

Entrepreneurs continued to co-create and share knowledge with other players in the market, resulting in the occurrence of the effectual pre-commitment dimension throughout all three stages. The dimension pre-commitment is often renamed as *partnerships* in other research (e.g. Reymen *et al.*, 2015), since partnerships form an important part of this dimension. This study also found a strong focus of ventures on partnerships, but it is questionable if a focus on partnerships by co-creating products and sharing knowledge with other market players without making further commitments to the venture's development should be considered effectual decision-making (Sarasvathy, 2001). One could even argue that the measured partnerships are strategic alliances that help to create competitive advantages, and therefore could be considered causal decision-making. Future research would benefit from making a clear distinction between situations in which entrepreneurs involve others players who are truly committing to the new venture's development, which is effectual, or if entrepreneurs decide to co-create with partners to gain a stronger and more competitive position, which is causal.

Entrepreneurs increasingly conducted market analysis as their venture matured. One possible explanation is that when ventures mature and hire more employees for daily routines, there might be more time for entrepreneurs to conduct market analysis. Another possible explanation is that as the stakes of running the venture get higher, entrepreneurs no longer feel comfortable making decisions

based on their gut feeling and prefer to make business decisions based on market information. Entrepreneurs also started to make more competitive decisions targeting other market players, for example by hiding production processes and knowledge from other players in the industry. Effectuation literature indicates that as ventures mature, more causal decision-making is conducted (Sarasvathy, 2001; Read and Sarasvathy, 2005; Wiltbank *et al.*, 2006). The results of this study seem to suggest that this is particularly the case for the dimension competitive analysis.

The other dimension that became more apparent in the establishment stage is the avoiding contingencies dimension. In the first two stages, entrepreneurs did not stick to pre-made plans. Planning becomes more important as ventures developed. This is especially the case for novice entrepreneurs, who mostly aligned the venture's development with their personal preferences, but started to plan ahead more in the establishment stage. The increasing importance of planning and conducting market analysis is in line with what is suggested in most previous research, which states that planning-based behaviour increases as ventures develop (Wiltbank *et al.*, 2006; Reymen *et al.*, 2015).



## 6.2 Reflection study design

This study is among the first to explore the role of effectuation in low-uncertainty new venture creation, filling a literature gap (Reymen et al., 2015; Sarasvathy; 2008). Predictable conditions should stimulate causal decision-making, with entrepreneurs planning ahead to position their venture in a way that it can maximize returns (Sarasvathy, 2001; Wiltbank *et al*, 2006, Read *et al*, 2009; Fisher, 2012). In early stages of new venture creation, entrepreneurs feel optimistic about their ability to predict the future and therefore apply a lot of causal decision-making (Jiang & Tornikoski, 2018). It therefore is surprising to see that the result of this study suggests that effectuation not only plays a role in low-uncertainty new venture creation, but is even more dominant than causal decision-making in the early stages of new venture creation. Following personal preferences seemed to be the crucial factor determining the venture's development. Future research should consider the possibility that entrepreneurs are more inclined to create a venture according to personal preferences, rather than to make predictions and market analysis.

The qualitative research design of this study allowed deeper analysis of the reasons why entrepreneurs changed their decision-making strategy. Semi-structured interviews seem to be a good method for exploring reasons behind changing decision-making behaviour. Also, the qualitative research methods allowed some surprising results to be found. By treating effectuation and causation as independent constructs, I found that entrepreneurs focus on partnerships, which belongs to the effectual pre-commitment dimensions, and simultaneously conduct market analysis, which belongs to the causal dimension of competitive analysis. This study thus highlights that dimensions that are often presented as effectual vs causal (e.g. Alsos *et al.*, 2014; Chandler *et al.*, 2011; Brettel *et al.*, 2012), as is the case with pre-commitment and competitive analysis, are actually co-occurring in the development of a venture. I therefore encourage future research to be conducted in a qualitative way.

## 7 Discussion

### 7.1 Effectuation in low-uncertainty new venture creation

This study investigated strategic decision-making during the process of low-uncertainty new venture creation. Effectuation might play a larger part in low-uncertainty new venture creation than the current literature suggests. The findings of this study highlight that entrepreneurs apply both effectual and causal decision-making, previously referred to as a 'hybrid logic' (Reymen *et al.*, 2015). This is in concurrence with some previous findings (Reymen *et al.*, 2015; Dew *et al.*, 2011) and in contrast with studies that treat effectuation and causation as a mutually exclusive dichotomy (Brettel *et al.*, 2012; Dew *et al.*, 2009b). Effectuation seems to be applied in especially the start-up stage, and more causal methods are applied as ventures mature.

My findings also suggest that expert entrepreneurs apply a mix of effectual and causal methods throughout all stages of new venture creation, whereas novice entrepreneurs shift from predominantly effectual decision-making to predominantly causal decision-making. This study therefore contrasts the common belief that effectual methods are only applied by expert entrepreneurs (Sarasvathy, 2001; Dew *et al.*, 2009b, Fisher, 2012). The difference between the findings of previous studies and this study might be explained by the fact that this study analysed practicing entrepreneurs, whereas Sarasvathy (2001) and Dew *et al.*, (2009b) conducted lab-based think-aloud protocols with MBA students and expert entrepreneurs. Effectuation literature would benefit from more empirical research aimed at better understanding the differences between novices and experts, since recent empirical results (e.g. Reymen *et al.*, 2015) deviate from the commonly believed assertion that levels expertise is related to effectuation.

Previous research highlights that novices start ventures with great enthusiasm (Cardon *et al.*, 2009) and apply predicting methods (Jiang & Tornikoski, 2018). The results of this study suggest that rather than applying causal methods, most entrepreneurs create whatever they want to create using effectual methods, relying on their personal preferences, their personal network and the means available to them. For these ventures, the potential profitability of the venture might not have played a large part in the early stages of new venture creation. One of the ventures included in this study (venture K) that was seeking to maximize profitability was applying purely causal methods. More research aimed at analysing how important profitability is for the entrepreneurs might explain why effectual or causal paths are chosen. I believe the motivation of the entrepreneur might change during the new venture creation process. The focus on personal preferences might shift to making decisions orientated towards growth and profit when the new venture creation process is not new and exciting anymore. The balance between trying to maximize profit and creating what an one wants to create is an interesting relation with regards to effectual and causal decision-making. Future qualitative

research might benefit from studying this relationship in depth, focusing on the change in entrepreneurs' motivation as their ventures develop.

## 7.2 Conditions driving changes in decision-making

The next step in the development of strategic decision-making theories is to better understand the conditions stimulating effectuation and causation (Perry *et al.*, 2012; Read *et al.*, 2016). The findings of this study yield two interesting insights. Firstly, I found that the need for financial resources is one of the main conditions why entrepreneurs apply causal decision-making. As predicted by Arend *et al.* (2015) entrepreneurs apply causal decision-making, in the form of creating business plans, to attract the finance required to seize an opportunity. Even if entrepreneurs have a preference for effectual decision-making, they are forced by a bank to provide a detailed plan, usually with a scope of three to five years, in order to gather the finance necessary to start a venture when they do not have the required resources themselves. This finding is in contrast with the work of Reymen *et al.* (2015), who stated that insufficient resources lead a venture to widen their scope and apply more effectual decision-making. The focus on attracting additional finance using banks and crowdfunding campaigns could be explained by entrepreneurs not having a network that can provide resources to their ventures, or not having the capabilities to embed themselves in such networks. Future research could focus on how the networks of entrepreneurs influence their ability to commit more stakeholders to their ventures as they develop, and in turn, if this influences the financial structure of their ventures.

The second finding of this study is that novice entrepreneurs switch from effectual to causal decision-making when they perceive less control over the outcomes of their actions. As ventures grow, the stakes of running the venture get higher since more people depend on the success of the firm. When novices run into challenges, such as liquidity or production problems, they stop following personal preferences and start to apply more planned-based decision-making to regain control of a challenging situation. Future longitudinal studies on novice entrepreneurs could verify if similar results in other industries are found. A better understanding of the differences in the decision-making of expert and novice entrepreneurs would help the development of effectuation theory.

### 7.3 Practical implications

My research indicates that entrepreneurs apply both planning-based and flexible decision-making when creating their ventures. The ability to switch between these different behavioural logics has practical implications for entrepreneurs and investors. Entrepreneurs benefit from reflecting on their decision-making and how it impacts their ventures. The ability to switch between a planned-based decision-making model to more flexible decision-making is an important entrepreneurial capability. Investors benefit from this study by realizing that there does not have to be a thorough business plan in order for a venture to be successful. Even if entrepreneurs make business plans they do not necessarily stick to those plans after they started their venture. Entrepreneurs operating effectually do not create business plans, but rather focus on what they can control. Investors should find a way to determine the potential profitability of a venture by analysing other aspects than a business plan.

Entrepreneurship education should teach students to apply both planning-based decision-making and flexible decision-making. It would be of great help if future entrepreneurs are able to recognize in what situations they should try to create something with the means available to them or work towards a goal, when they should maintain flexibility or apply more planning based decision-making, when they should work together with others or try to compete, and when they should invest only what they can afford to lose or to make investments based on a calculation of future returns. Furthermore, it would also help them to identify the decision-making strategy of other entrepreneurs.

# Appendices

## Appendix I: Interview framework

### Part 1: Introduction

#### **Study introduction**

- This study aims to better understand how entrepreneurs make business decisions. It does so by collecting data on the decision-making logic of entrepreneurs in new venture creation. This interview will analyze if the way entrepreneurs make decisions differs in stages of new venture creation, starting from the moment they assess the opportunity to start a venture.
- This study is the final step to obtaining my Master's Degree in Business Administration (specializing in Entrepreneurship, Innovation & Strategy).
- The interview will be recorded and transcribed after the interview. I will be the only one who has access to the recordings and I will not share the recordings unless permission is explicitly granted by the interviewee.
- Any information provided in the interview will be treated with confidence.
- If requested, a copy of the resulting article will be made available to the interviewee.
- The interview will take somewhere between 45 to 60 minutes. In rare cases, this could be shorter or longer.

#### **Entrepreneur and company**

- a) Entrepreneur background: previous experience, relevant education.
- b) Company background: Year it was founded, core business activities, number of employees, regions of sales, method of sales.

### Part 2: Opportunity Assessment

- a) Please talk about how you assessed the opportunity to create a new Craft-brewery?  
*Did you do any (market) research or more or less just started?*
- b) Please tell how you assessed the uncertainties of the future of the craft-brewery industry  
*(such as a sudden decline in demand)?*
- c) What role did other people play in the assessment of the opportunity?
- d) What was vital in your decision to start a craft-brewery?

### Part 3: Start-up stage

- a) After deciding to start a venture, how did you decide how much you would invest? *Was there another party investing? (If so, how did you convince him to invest in you?)*
- b) Please talk about how you created the products that you sell? *Did you experiment a lot and came up with several products or did you decide that you wanted a specific range of products?*
- c) Please talk about the people involved in the product creation? *Did you try to work with other stakeholders such as suppliers, customers, other craft-brewers? What role do other players in the market play in your product development?*
- d) How do you deal with future uncertainties, such as shortages of certain resources needed for your production?

### Part 4: Establishment stage

- a) Do you have a clear goal for the future? Do you intend to grow at a certain rate? (How many years from now?) *What role does prediction of the future play in how you assess the future?*
- b) *Please tell something about the role of flexibility in your future plans for the company? If yes, how does this influence your current organization?*
- c) Can you please tell something about the influence of feedback received by all stakeholders, and what role they play in the decision-making for the future? *Did the influence of stakeholders in the decision-making change once the company older?*

### Part 5: Finalization

- Double check if entrepreneur agrees with me using the data gathered by this interview for my study.
- Checking if entrepreneur would like to receive a (digital) copy of the study once finished.
- Thanking of entrepreneur.

## Appendix II: Interview Invitation Mail

*The Interview Invitation Mail below is translated into English, the original letter was sent in Dutch.*

Dear Mr. / Ms. .... ,

Currently, I am writing regarding a potential collaboration with firm, gaining insight in entrepreneurial decision-making. It is a crucial component of my master thesis at the university of Twente to obtain my Master Degree in Business Administration. This study will document the development of the entrepreneurial decision-making regarding your firm, which may be insightful to you.

The aim of this study is to better understand how entrepreneurs make decisions when they are creating new ventures. In order to gather the required data, interviews will be conducted with entrepreneurs from the craft-brewery industry. For this reason, you have received this e-mail.

The analysis of your firm will be compared to the findings obtained from other firms that will be studied. The findings will be made available to you after this study is completed. The data gathered in this interview will be made 100% anonymous. Any sections that you would like to see removed will be excluded from the interview. The resulting data will only be stored for the duration of the study. The interview will take approximately 45-60 minutes.

I will get in touch with you in order to discuss your potential participation in the near future. Even after you have confirmed, you can cancel the interview without any consequences. It would be of great help to my research if you are willing to participate and I look forward to collaborating with you.

Kind regards,

Jouke Gardien

## Appendix III: Cases

The new venture creation of the individual cases not highlighted in chapter 4.2 is briefly outlined in this section in order to provide a better picture of how these firms applied effectual and causal decision-making. For every venture, a figure displays the amount of effectual and causal decision events/intentions per stage of new venture creation. The table next to the figures point out which dimensions of effectuation and causation account for the scores displayed in the figures. Similar to table 3, for all tables listed below MO = Means Orientated, GO = Goal Orientated, LC = Leverage Contingencies, AC = Avoid Contingencies, PC = Pre-commitment, CA = Competitive Analysis, AL = Affordable Loss, ER = Expected Returns.

### Venture A

Figure 3, Effectual and Causal decisions coded venture A

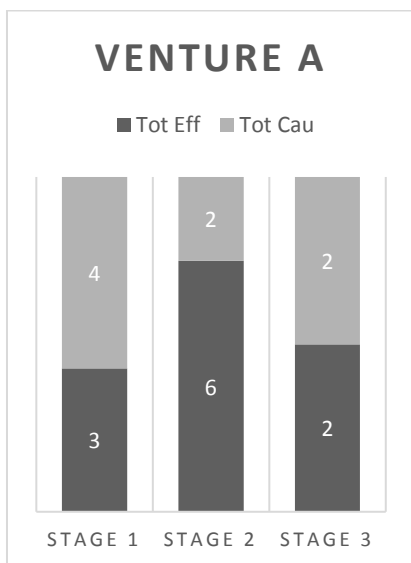


Table 13, coded decisions per dimension venture A

Stage 1		Stage 2		Stage 3	
MO	1	MO	3	MO	0
LC	0	LC	0	LC	0
PC	0	PC	2	PC	1
AL	1	AL	1	AL	1
GO	1	GO	1	GO	1
AC	0	AC	0	AC	0
CA	2	CA	2	CA	1
ER	0	ER	0	ER	0

Venture A is a control variable in the sense that the entrepreneurs behind Venture A are part-time entrepreneurs. Their primary source of income is an office job, which is reflected by a low number of hectoliters sold. The entrepreneurs decided to invest a small portion of their personal savings according to the affordable loss principle and indicated a preference to keep the firm small. The entrepreneurs indicate a strong preference of following personal preferences when developing their business.

The causal feature of this venture is mostly due to market analysis, which was conducted in all stages. Furthermore, the entrepreneurs set some goals.



Venture A applies a mix of effectual and causal decision-making. The decision-making logic of Venture A did not change radically as the venture progressed to later stages of new venture creation.

### Venture B

Venture B was founded by two entrepreneurs who were already brewing beer as a hobby, and initially invested only what they could afford to lose. The entrepreneurs created beer that was in line with their personal preferences without conducting market analysis. The entrepreneurs focused on working together with other breweries and created beers that they personally liked. Detailed long-term plans were not created in the first two years and the entrepreneurs' decision events were all coded effectual.

Figure 4, Effectual and Causal decisions coded venture B

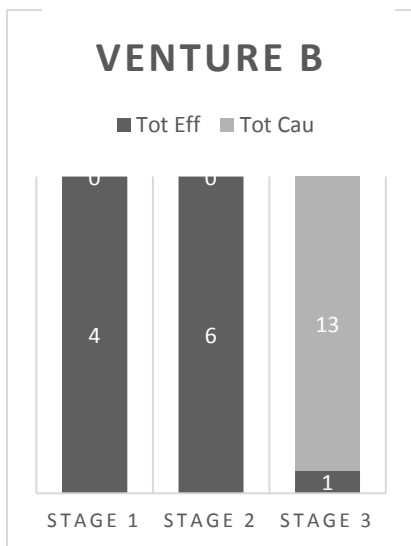


Table 14, coded decisions per dimension venture B

Stage 1		Stage 2		Stage 3	
MO	2	MO	2	MO	
LC		LC	1	LC	
PC		PC	2	PC	1
AL	2	AL	1	AL	
GO		GO		GO	3
AC		AC		AC	3
CA		CA		CA	4
ER		ER		ER	3

This changed when the entrepreneurs signed a contract that included monthly fixed costs: 'until then we did not have any obligations, if we would not sell anything for a month that would not matter. The moment you agree to fixed costs you have to sell enough to be able to do this. When certain beers were demanded in 2015, we decided to produce those beers.'

The entrepreneurs decided to take the venture to the next level by investing in a brewing installation. A business plan was created to attract investments and followed strictly. Furthermore, the entrepreneur conducted market analysis and created beers that would sell well. The entrepreneur indicated that they now 'work according to the business plan ... we have to make a living out of this. ... Things are more market driven now, we look at what currently is in demand. We make more business case like calculation, for the numbers we play have a way higher, we want to make the right choices. The stakes are way higher, even though we still make some decision on gut feeling.'

Venture B is a perfect example of a venture relying on effectual decision-making in the first two stages of new venture creation. The moment the entrepreneurs agreed to fixed costs, the decision-making got more causal than effectual, further strengthened by the growth of the venture. The entrepreneurs showed that their best way to keep control of a growing venture that they rely on is by applying causal decision-making.

### Venture C

Venture C was founded by three entrepreneurs who seized the opportunity to start a brewery. A business plan was created in cooperation with professionals to attract finance. Several parties invested in the venture and a brewery was constructed. Initially, market analysis was conducted to determine the type of beer produced.

Figure 5, Effectual and Causal decisions coded venture C

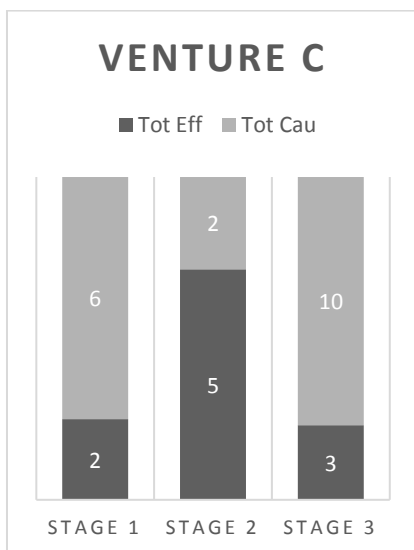


Table 15, coded decisions per dimension venture C

Stage 1		Stage 2		Stage 3	
MO	1	MO	3	MO	1
LC		LC	1	LC	
PC	1	PC	1	PC	1
AL		AL		AL	1
GO	2	GO		GO	2
AC	1	AC	1	AC	2
CA	1	CA	1	CA	5
ER	2	ER		ER	1

Venture C has two turning points, the first being the change from a mostly causal opportunity assessment to a more effectual start-up stage. The first two years the venture did not follow the business plan and started to experiment with different types of beers that were created according to personal taste: “in the beginning we mainly looked at our personal preferences and not at the market. We were pretty arrogant and thought the consumer would like the beers since our taste is not that extreme. We used our own reference point ... in hindsight, I would do it differently.”

The venture was growing quickly, which was due to the situation it was in: “In 2011, there were roughly 100 breweries in the Netherlands. The demand for local beers was rising, so we could sell anything.

We could walk into a bar with a beer made with coffee, or a Halloween pumpkin beer, and we would easily sell it.” This allowed the entrepreneurs to create the venture according to their own personal preferences, without consulting the business plan that was created in the first stage.

The second turning point took place in the establishment stage. As aforementioned, the number of breweries grew rapidly in the period after 2011. Venture C noticed a growing competition: “At a certain point, more breweries started to sell their beer to all cafes and it got harder to sell ours ... We hired an experienced agent, who asked the brewers: “for who are you brewing this? Are you brewing for yourself or for the market?” The brewer answered: “I brew what me and my family like”. This woke me up, you can’t provide for twenty-two people if you work like this.” He decided it was time for a change: “We noticed that the warehouse we took our unsold specials to was growing rapidly. I then realised we had to change our decision-making, something was not right and we had to choose a direction.”

The entrepreneur decided to go back to producing only a core range of beers, as was in the original drafted business plan. He updated the business plan with a new scope of three years. The entrepreneur indicated that he does not want to deviate from the plan if new opportunities arise: “If I see chances and opportunities I am always enthusiastic. But it certainly is not in the plan, so don’t do it: keep it stupid and simple.”

The entrepreneur indicated that his view on other breweries changed over the years: “in the beginning we (craft-breweries) wanted to create a new world and promote it together. But I realise some craft-breweries are in this for the money, other are smaller and have more passion for beer. There are many different types of breweries, but the beer world is getting tough. ... Everyone is fighting for their existence and offers bars and cafes good deals to get you off the tap. This is a threat, and we have to deal with this.”

Venture C was the only venture that saw a decline in hectolitres sold since they ran into production problems and made some bad choices. Their reaction was to drastically change their decision-making from mostly effectual decision-making to causal decision-making.

## Venture D

Venture D was founded by two entrepreneurs who started brewing beer as students in 2012. They scrapped together some savings to start a brewery and experimented with a lot of different types of beer. In 2014 the venture was officially registered. The entrepreneurs had a distinct ideology on beer. The decision made when assessing the opportunity were predominantly effectual.

The first turning point came into the start-up stage, when the entrepreneurs captured their ideology in a business plan. The business plan allowed the entrepreneurs to attract finance required to expand their firm: 'we wanted to create something for the long term and we needed the financial space to do that.' Unlike others, the entrepreneur did see more value in a business plan than just attracting finance: 'if the bank did not require me to write a business plan, I would have done it anyway. It is an ambition statement.'

The entrepreneurs also attracted new employees and consulted experts to cover their weak points: 'we did not have experience in communication, so we hired someone for that. ... We also let an accountant advise us on our liquidity, for we invested €400.000, we needed things to go well.'

The entrepreneurs showed that they turned to causal decision-making to attract finance, but also they realized that in order for them to grow their venture the way they wanted to, they needed to change the knowledge within the venture.

Figure 6, Effectual and Causal decisions coded venture D

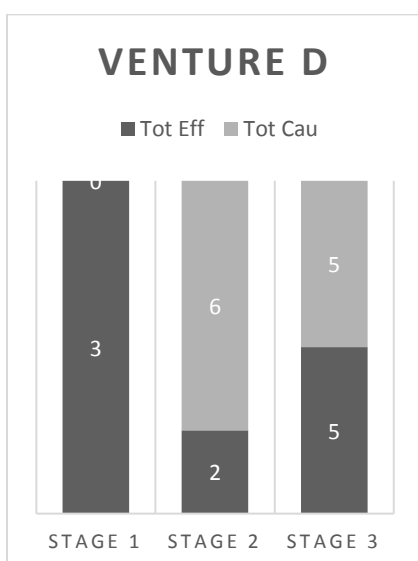


Table 16, coded decisions per dimension venture D

Stage 1		Stage 2		Stage 3	
MO	2	MO	1	MO	1
LC		LC		LC	1
PC		PC	1	PC	3
AL	1	AL		AL	
GO		GO	2	GO	2
AC		AC	1	AC	1
CA		CA	1	CA	1
ER		ER	2	ER	1

In the establishment stage, the decision-making turned more effectual again. Still some causal decision-making was there in the third stage. The entrepreneurs frequently updated their business plan: ‘the business plan is a living thing. Our venture is so young, we change our goals every year, with a scope of three years.’ Furthermore, the role of the market plays a bigger role than in the beginning: ‘I am looking into how to sell my beer more than in the beginning ... My goal is to grow and realize my vision. This can only be done if my beers are actually sold. How do I make sure people drink my beer? By creating a beer people want to drink.’

There was a strong emphasis on pre-commitments with stakeholders, such as involving restaurants in the production process and establishing themselves in an European network. The entrepreneurs also share their knowledge and processes with other breweries: ‘When a consumer has a bad experience with craft-beer, he will go back to ordering pilsner, or Leffe. I want to invest time and effort in increasing the quality of all craft-breweries by sharing knowledge.’

But more than any other factor, it was most important to work according to their own ideology and according to their personal preferences. The causal decision-making seems to be the tools needed to eventually steer the venture in the direction the best aligns with their human aspirations.

## Venture E

Figure 7, Effectual and Causal decisions coded venture E

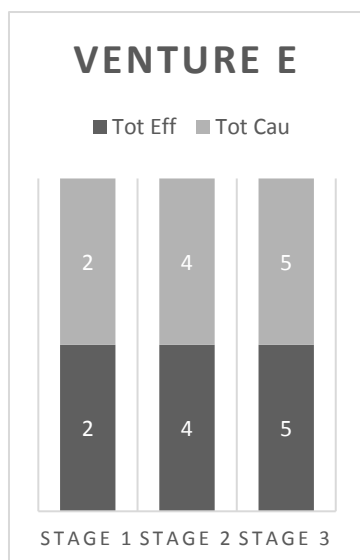


Table 17, coded decisions per dimension venture E

Stage 1		Stage 2		Stage 3	
MO		MO	1	MO	2
LC		LC		LC	1
PC	1	PC	3	PC	2
AL	1	AL		AL	
GO	1	GO	2	GO	1
AC		AC		AC	2
CA	1	CA		CA	2
ER		ER	2	ER	

Venture E was founded by an entrepreneur in 2016. The entrepreneur had five goals for the venture that were not written down but were in the back of his head. He started a venture using his own

resources. In the start-up phase, more stakeholders committed themselves to the venture as the entrepreneur made steps towards realising the five goals. The projects were financed by adding more stakeholders to the venture who would invest, and also by a crowdfunding campaign.

Some market analysis was done, but the market analysis did not determine the product portfolio of the venture. The entrepreneur followed his personal preferences during the business development and would not limit his decision-making by a strict business plan. However, decisions had to be directed towards reaching the five goals one way or another.

Venture E is has been developing the business by using both causal and effectual decision-making throughout the process of new venture creation.

**Venture F**

Venture F was founded by an entrepreneur who pursued the opportunity to start a brewery for it was in line with personal preferences. The entrepreneur partnered up with a friend (who later withdrew from the project), who wrote a business plan. Hence, venture F set goals at the start, but the entrepreneur did not recall the goals at the time of the interview. Funds were initially attracted from the personal network and later from a crowdfunding campaign to fund a brewing installation.

Figure 8, Effectual and Causal decisions coded venture F

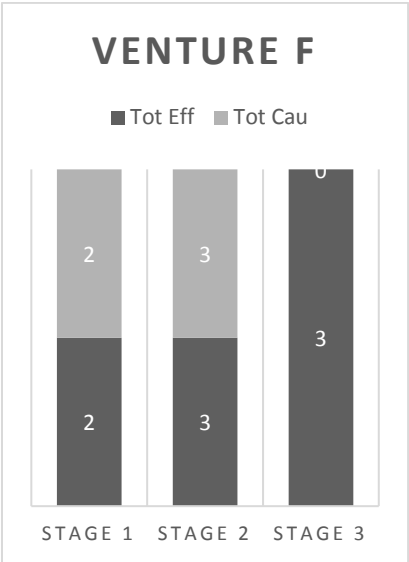


Table 18, coded decisions per dimension venture F

Stage 1		Stage 2		Stage 3	
MO	1	MO	1	MO	1
LC		LC	1	LC	1
PC	1	PC		PC	1
AL		AL	1	AL	
GO	1	GO	2	GO	
AC		AC		AC	
CA		CA	1	CA	
ER	1	ER		ER	

Venture F considers other breweries as potential partners. The entrepreneur had a strong tendency to make decisions according to personal preferences throughout the venture creation. This resulted in a shift from a mix of causal and effectual decision-making to effectual decision-making. It is questionable

if any goals would be set if it was not required to write a business plan when financing the brewing installation.

### Venture G

The entrepreneur assessed the opportunity to start a brewery with a mix of causal and effectual decisions. He partnered up with a friend since running a brewery was in line with their personal preferences. They learned how to brew and discussed the opportunity with friends from their network. A detailed business plan, including market analysis, competitive analysis and forecasting was created to attract investors. The entrepreneur indicated that he only wrote the business plan to attract investments: “the business plan was created to convince others that starting a brewery was a good idea.”

In the start-up stage, the entrepreneurs relied mostly on effectual decision-making. The business plan enable the entrepreneurs to gather the required funds to start a brewpub, which was created by involving as many local stakeholders as possible. The venture experimented with a lot of beer and collaborated with many other breweries. The business plan was not consulted in the first two years of the venture’s existence: “no, it (the business plan) was in the back of my head, but in the end we had to work hard and we did not have time to contemplate ... In the beginning we were mostly focused on the day to day activities. We had the idea that we wanted to grow, but did not create new plans.”

Figure 9, Effectual and Causal decisions coded venture G

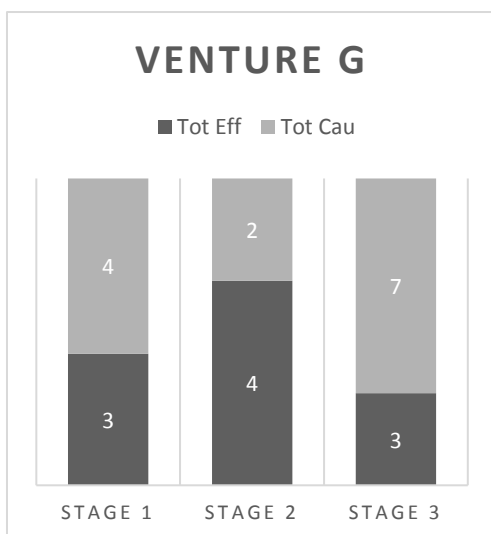


Table 19, coded decisions per dimension venture G

Stage 1		Stage 2		Stage 3	
MO	2	MO	1	MO	1
LC		LC	1	LC	1
PC	1	PC	2	PC	1
AL		AL		AL	
GO	2	GO	1	GO	3
AC		AC		AC	1
CA	1	CA		CA	1
ER	1	ER	1	ER	2

After reaching the third stage of new venture creation, the venture focused more on creating a core range of beer. The venture hired two salesmen to increase their sales numbers. Targets were set for the salesmen, which would be evaluated after one year. Some other goals were set as well, but the entrepreneur indicated that he wants to remain flexible in pursuing business opportunities.

Venture G started the venture using effectual decision-making. However, in order to finance their brewpub they needed to create a business plan, which explains the causal dominance in the first stage. The venture operated more effectual in the start-up stage. However, the wish to grow their venture required them to attract additional means and this came hand in hand with more causal decision-making.

**Venture H**

Venture H was founded by four friends who were already actively home-brewing and decided to turn their hobby into a venture. They invested what they could afford to lose and grew very organically in the start-up stage, following personal preferences. The entrepreneurs did focused on the short term.

Figure 10, Effectual and Causal decisions coded venture H

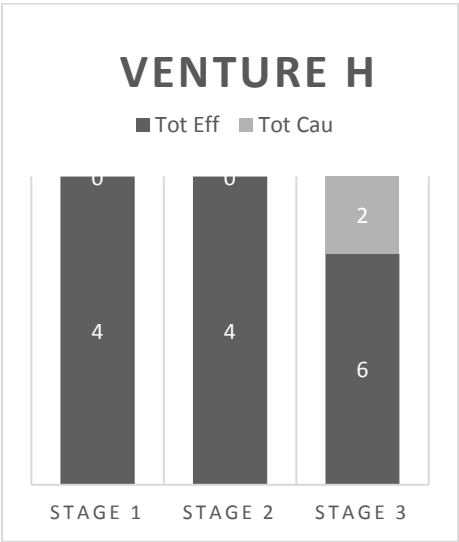


Table 20, coded decisions per dimension venture H

Stage 1		Stage 2		Stage 3	
MO	2	MO	2	MO	1
LC		LC	1	LC	2
PC	1	PC		PC	2
AL	1	AL	1	AL	1
GO		GO		GO	
AC		AC		AC	
CA		CA		CA	1
ER		ER		ER	1



The venture invested into new brewing location. Finance was found by conducting a small-scale crowdfunding campaign, attracting ambassadors to the venture. Other breweries were considered potential partners rather than competitors. The venture continued to focus on short-term events and kept future options mostly open.

Venture H is a good example of a firm operating in an effectual way. The only causal decisions coded are due to an adjustment to market demands and by attracting external finance.

**Venture I**

The entrepreneur of venture I wanted to start a brewery after realizing this would suit him well. He then learned how to brew and partnered up with a friend. Together, they had enough resources to start a brewery. No market research was conducted and no goals were set, the entrepreneurs simply started.

Figure 11, Effectual and Causal decisions coded venture I

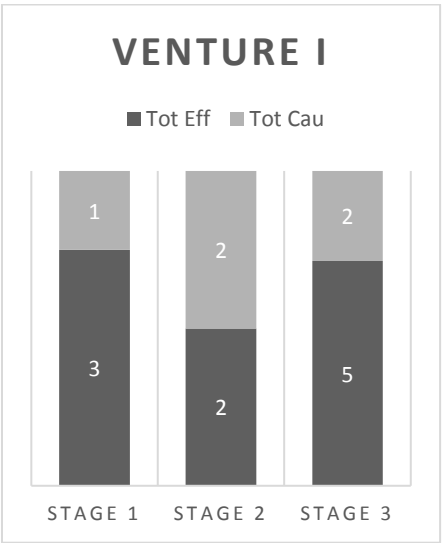


Table 21, coded decisions per dimension venture I

Stage 1		Stage 2		Stage 3	
MO	1	MO	1	MO	
LC	1	LC	1	LC	2
PC	1	PC		PC	2
AL		AL		AL	1
GO		GO		GO	
AC		AC		AC	
CA		CA	1	CA	1
ER	1	ER	1	ER	1

The entrepreneurs invested in a large brewery and constructed it mostly by themselves. Beers were produced based on what the entrepreneurs would sell well in their local environment, for the entrepreneurs focused on returns on their investments. The venture partnered up with a school that offers an education as professional brewery, ensuring a surplus of future qualified brewers. Furthermore, a decision was made to partner up with an investor opening a brewpub over a phone-call.

Venture I did not believe in planning and goal setting throughout the development of the venture. The causal aspects of this venture are mostly due to a focus on returns on their investment.

**Venture J**

Venture J assessed the opportunity in a mix of causal and effectual dimensions. Venture J was founded by an entrepreneur who was already a professional brewing at a relatively large craft-brewery. The entrepreneur discussed the opportunity with people in his personal network and partnered up with two others to form an entrepreneurial team. The entrepreneurial team had the knowledge, identity and network to create the venture, but later consulted an accountant to create a financial plan.

Figure 12, Effectual and Causal decisions coded venture J

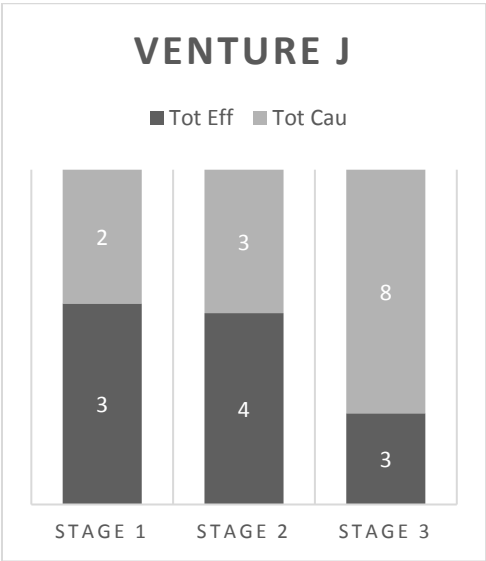


Table 22, coded decisions per dimension venture J

Stage 1		Stage 2		Stage 3	
MO	2	MO	2	MO	
LC		LC		LC	
PC	1	PC	2	PC	2
AL		AL		AL	1
GO	1	GO	1	GO	2
AC		AC		AC	4
CA		CA	1	CA	2
ER	1	ER	1	ER	

The start-up stage was a mix of causal and effectual dimensions as well. The venture attracted finance using a mix of crowdfunding, a bank loan, personal savings and an investor. The investor also brought in knowledge to assist the venture in financial affairs. A brewery was constructed and many different types of beers were created, mostly according to personal preferences, which was extreme. The venture targeted the niche part of the beer market.

In the third stage, the venture relied more heavily on causal decision-making. The most important reason for this is that the venture was running into liquidity problems: “2016 was a financial disaster,

for we put all costs in 2016. We closed 2017 with a small profit, but the liquidity was terrible. We could see that there was a great need for more volume ... We decided to partner up with a venture that would sell beer for us. But they will not do that with twenty-six if your beers, but with two. So we made our beers maar accessible, purely so we could pay the bills. The market dictates what we create, as was the case when we created a Weizen. ”

After the venture ran into liquidity problems, KPI's were created for departments in the venture. The venture started to strictly work according to the plans. The venture would not deviate from their pre-set goals: 'I have a very clear goal. First we need to get financially healthy, so our target is purely based on volume. Those are the targets.'

Venture J is an example of a venture who started to create according to personal preferences, but when the venture got into trouble, the entrepreneurs decided to change the course to more causal methods.

## Venture K

Founded in 2016, venture K has not yet reached the third stage of new venture creation. Venture K was founded by an entrepreneur who previously had written business plans for other ventures. He wanted to ensure an early retirement and thought that a brewery would be a good investment and created a business plan. He constructed a project team of experts who evaluated his business plan. The goal of the entrepreneur was to maximize the value of the company, so he could sell it after a set number of years.

Figure 13, Effectual and Causal decisions coded venture K

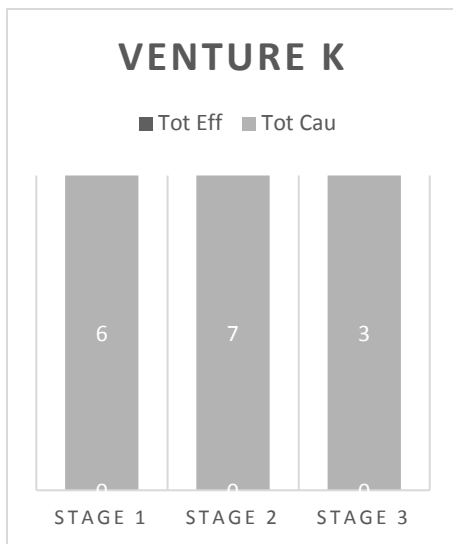


Table 23, coded decisions per dimension venture K

Stage 1		Stage 2		Stage 3	
MO		MO		MO	
LC		LC		LC	
PC		PC		PC	
AL		AL		AL	
GO	2	GO	2	GO	1
AC	2	AC	1	AC	1
CA	1	CA	3	CA	
ER	1	ER	1	ER	1

He financed a brewery with the use of a crowdfunding campaign, his own finance and a bank loan. Other breweries, as well as everyone who serves beverages, are considered and treated as competitors. The venture operated according to the business plan and will not deviate from the plan.

Venture K is a good example of a venture founded and developed in a causal way. From the moment the entrepreneur pursued the opportunity to when the entrepreneur intends to sell the venture it was operated in a causal way.

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