MASTER THESIS

# EFFECTUATION AND CAUSATION AMONG DUTCH EXPERT ENTREPRENEURS

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**Master Thesis**

# Effectuation and Causation among Dutch expert entrepreneurs

How Dutch expert entrepreneurs apply the principles of causation and effectuation

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# Preface

"*The only way to predict the future, is to have power to shape the future*" – Eric Hoffer

This quote is not only fitting to the topic of this thesis, it is also fitting to the road I traveled to get to present you this thesis. From where I started out my student career, I couldn't have predicted on what topic I would end my student career. The turns that I choose and the bends the road shaped into along the way sparked and spurred my interest into the subjects of entrepreneurship and innovation. This thesis concludes my Master of Science in Business Administration, with a specialization in Innovation Management & Entrepreneurship, at the University of Twente in Enschede, The Netherlands, but the road continues, with more turns and bends to come.

First of all, I would like to express my gratitude and thanks to my first supervisor, Martin Stienstra MSc, for giving me the opportunity to join the EPICC project and for his guidance, support and insights. Your enthusiasm provided to be invaluable. Also, I would like to thank my second supervisor, Dr. Michel Ehrenhard, for his valuable feedback on the research.

I would like to express my thanks to the twenty entrepreneurs that took the time and effort to participate in my research and enriched me with their knowledge and personalities. Last, but not least, I sincerely would like to thank my family, partner and friends for their unconditional support and encouragement.

Enschede, August 2014,

Bart de Jong

# Management summary

With the world being globally connected at increasing speeds and ease, more people than ever turn to entrepreneurship as their main source of income. As the overall attention on entrepreneurship is growing, governments stimulate and subsidize innovation programs and startup incubators are increasingly active. In line with that, the research into entrepreneurship is rapidly gaining interest in the academic world. One direction in the research field of entrepreneurship that particularly stands out is the decision-making process of expert entrepreneurs, on which Sarasvathy (2001a) made a significant contribution. She distinguishes the concepts of causation and effectuation. Causal decision-making takes a certain effect as given and focuses on selecting between means to create that effect, whereas effectual decision-making starts with a given set of means and focuses on selecting between possible effects that can be created with that set of means. Sarasvathy states that expert entrepreneurs predominantly use effectuation. The objective of the research at hand is to expand and deepen the body of knowledge on these processes and in particular on effectuation. By researching the use of causation and effectuation among Dutch expert entrepreneurs, a broader insight into effectuation is gained, for most contributions to existing empirical work on effectuation are based on data gathered in the United States.

The use of effectuation and causation by Dutch expert entrepreneurs was researched by means of both a qualitative and a quantitative research method, with a sample size of 20 subjects. By applying the think aloud method as a qualitative research method, the respondent is requested to think out loud while formulating an answer on a given problem or question in a business case, therefore verbalizing their thought as these enter consciousness, maximizing observed cognitive information and behavior. The quantitative method entailed a survey to test the dimensionality of causation and effectuation.

The results indicate that Dutch expert entrepreneurs do not use all effectuation principles as proposed by Sarasvathy (2001a), finding only significant proof for the effectual principles of means-based and partnerships & alliances. Furthermore, on the subject of risk, Dutch expert entrepreneurs take a more causal stance, preferring a focus on expected returns instead of a focus on affordable loss, contrasting the assumptions of Sarasvathy (2001a). The survey even provided no proof for a preference of causation or effectuation. The sample size of the research is rather small

for a quantitative method, decreasing the generalizability, which could explain the absence of significant distinctions in the survey results. Another factor of consideration is the distinction between the think aloud method and survey in terms of immediacy in answering. The survey provided the subject the time and opportunity to consider several answers before making a weighed decision, removing the immediacy and allowing for retrospection ad introspection biases.

Based on the results, several recommendations for further research are presented to gain more insight into the principles of causation and effectuation. More research on this specific topic is required to increase its generalizability. Also, future research is recommended to investigate the importance of immediacy of the written or spoken verbalization of the thought in the application of effectuation. To improve the survey outcomes, investigation is required into what the questions evoke. Further research on effectuation and on its practical applications are recommended to focus on means-based behavior and the formation of partnerships & alliances, with special attention to its implication on leadership, developing a company vision and on human resource management. To effectively introduce effectuation, it is recommended to incorporate effectuation as a main element in studies of business administration.

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# 1 Introduction and research question

## 1.1 General Background

The research into entrepreneurship is rapidly gaining interest in the academic world (Busenitz et al., 2003; Shane, 2003). This upcoming field of research is valuable for its application in various domains and applications. From academic research fields like psychology and finance, to applications as poverty alleviation and political science, entrepreneurship plays a key role.

With the world being globally connected at increasing speeds and ease, more people than ever turn to entrepreneurship as their main source of income (Bosma, Wennekers, & Amorós, 2012).

As the overall attention on entrepreneurship is growing, governments stimulate and subsidize innovation programs and startup incubators are increasingly active (Haugen, 1990; Peters, Rice, & Sundararajan, 2004; Sarasvathy, 2001a). Unfortunately, not all entrepreneurs make it to the finish line, as the US Bureau of Labor Statistics (2011) illustrate. Only 50% of the American startup firms are still in business after 6 years and the curve of the survival rate per year since startup is consistent from 1994 through at least 2010. These are remarkable numbers that indicate current trends in the research field of entrepreneurship.

## 1.2 The research field of entrepreneurship

As Aldrich and Baker (1997) point out, the development of the field of research is still in quite an early stage towards becoming a normal science framework. Other scholars typify the field of entrepreneurship research as “remaining in the theory-building stage” of being a “multidisciplinary jigsaw”, characterized by “accumulative fragmentalism” (Busenitz et al., 2003; Harrison & Leitch, 1996, p. 69; Wiseman & Skilton, 1999). This accumulative fragmented nature is interpreted by Davidsson and Wiklund (2007) as a manifestation of entrepreneurship itself, stating that entrepreneurship commonly manifests as a “multi-level phenomenon”, exemplifying the possible difficulty in finding a general definition to entrepreneurship (Shane, 2006; Shane & Venkataraman, 2000).

The dialogue about finding a general definition is still ongoing. To find this general definition of entrepreneurship, more consensus on the boundaries of the field and its relevance is required. These boundaries need to be generated by theory development

and empirical testing (Pfeffer, 1993). Since 1993, a lot of theory development and empirical testing has been done in the field of management studies, but it was criticized to be lacking consensus by having too many theories and not enough theoretical and empirical integration (Hambrick, 2005; Pfeffer, 2005). According to Alvarez and Barney (2007), the opposite is true for the field of entrepreneurship.

In the field of entrepreneurship, the most common definitions that have been agreed upon, define entrepreneurship as “the process of creating or seizing an opportunity and pursuing it regardless of the resources currently controlled” (Timmons & Spinelli, 1994, p. 7) and as the study of “how opportunities to create future goods and services are discovered, evaluated and exploited” (Shane & Venkataraman, 2000, p. 172). The last definition is more widespread and is therefore the leading definition to describe entrepreneurship in this research.

Entrepreneurship research entails a number of different subjects, like, among others, the entrepreneur (Gartner, 1988), entrepreneurial traits (Baum & Locke, 2004), entrepreneurial learning (Politis, 2005), entrepreneurial processes (Davidsson, 2006) and exploitation vs. exploration (Choi & Shepherd, 2004). Research on the entrepreneur mainly focuses on the psychological implication of entrepreneurship, closely related to the area of entrepreneurial traits, which researches the characteristics that aid in entrepreneurship. Research on entrepreneurial learning explores how entrepreneurs learn the special capabilities that allow them to be effective at starting and running a business (Politis, 2005). In the research on exploitation vs. exploration, the distinctiveness is made between the exploration of new possibilities and the exploitation of old certainties for the benefit of the entrepreneur or the company (March, 1991). The research of this dissertation is conducted in the area of entrepreneurial processes, which is the “hottest” area of entrepreneurial research, having the “most academic potential” (Kuckertz, 2013). Academic contribution to the knowledge base of entrepreneurial processes is therefore fitting.

## 1.3 Entrepreneurial process

Over time, several definitions and conceptual frameworks of the entrepreneurial process have been created (Aldrich, 1999; Brockner, Higgins, & Low, 2004; Harvey & Evans, 1995; Low & Abrahamson, 1997; Stevenson & Jarillo, 1990; Venkataraman, 2002). These different definitions and conceptual frameworks all have a common ground when it comes to defining the entrepreneurial process. As Read and Sarasvathy (2005, p. 10) put it, “the entrepreneurial process is conceived as a

collection of decision tasks such as selecting an idea or opportunity to begin with, creating a legal entity garnering resources, bringing stakeholders on board, managing growth and exit strategies, and so on." This description is in line with the definition of the entrepreneurial progress by Bygrave and Hofer (1991, p. 14), who define the entrepreneurial process as "all the functions, activities, and actions associated with the perceiving of opportunities and the creation of organizations to pursue them". This leaves opportunities still undefined. According to the Oxford English Dictionary, as quoted by Sarasvathy, Dew, Velamuri, and Venkataraman (2010, p. 142), an opportunity is "a time, juncture, or condition of things favorable to an end or purpose, or admitting of something being done or effected." From this definition, Sarasvathy et al. (2010) deduce the definition of an entrepreneurial opportunity, consisting of "a set of ideas, beliefs and actions that enable the creation of future goods and services in the absence of current markets for them".

Central to the definition of Bygrave and Hofer (1991) is the perception of opportunity. This is backed up by Johanson and Vahlne (2009), according to whom opportunities are considered to be the most important element of the body of knowledge that drives the entrepreneurial process.

## 1.4 Perception of opportunity

The perception of opportunity has been extensively researched by a number of different scholars (Shane & Venkataraman, 2000), not only in the area of opportunity recognition (Baron & Ensley, 2006; Fletcher, 2006; Grégoire, Barr, & Shepherd, 2010; Hayton, George, & Zahra, 2002; Hofstede et al., 2004), but also in the areas of opportunity development (Corbett, 2007; Davidsson, 1995; Kirkman, Lowe, & Gibson, 2006; Miller, 2007) and opportunity discovery and creation (Alvarez & Barney, 2007; Bosma et al., 2012; Davidsson, 2003; Mitchell, Mitchell, & Smith, 2008).

The relevance of how an opportunity is perceived is illustrated by Sarasvathy et al. (2010), by stating that "the opportunity presupposes actors for whom it is perceived as an opportunity" and in line with that, "the opportunity has no meaning unless the actors actually act upon the real world within which the opportunity eventually has to take shape". Sarasvathy et al. (2010) thereby argue that whether something is an opportunity is dependent on how it is perceived by the actor or actors.

As Sarasvathy et al. (2010) articulate, dispersed information of particular time and place is a root explanation for the presence of uncertainty and of the nexus of enterprising individual and the opportunity to discover, create and exploit new markets

(Sarasvathy et al., 2010; Shane, 2000; Venkataraman, 2002). The presence of uncertainty facilitates the rise of opportunities (Sarasvathy et al., 2010). How this individual perceives the opportunities that rise from the presence of uncertainty might depend on the expertise that this individual developed over time in the area in which the uncertainty manifests (Read & Sarasvathy, 2005).

## 1.5 Effectuation

How entrepreneurs perceive these opportunities and how their decisions-making is structured was long thought to be based on a goal-driven behavior (Bird, 1989). This behavior is also known as a planning approach in which the entrepreneur predicts and prepares the organization for possible challenges that might occur in the future (Wiltbank, Dew, Read, & Sarasvathy, 2006). A more commonly, goal-driven behavior is referred to as 'causation'. Sarasvathy (2001a) defined 'causation' when she introduced the concept of 'effectuation', based on a means-driven behavior. She argues that causation is particularly effective in a stable, predictable environment, which is becoming more and more a scarcity as the world is becoming more dynamic and unpredictable. She argues that expert entrepreneurs show a more effectual way of reasoning. Instead of "taking a particular effect as given and focus on selecting between means to create that effect", expert entrepreneurs "take a set of means as given and focus on selecting between possible effects that can be created with that set of means" (Sarasvathy, 2001a, p. 245).

In the main-stream marketing textbooks, the predominant approach is still causational, as Andersson (2011) points out. But with information being processed at an increasingly fast rate, windows of opportunities are becoming smaller. The entrepreneur therefore needs to respond quickly to emerging opportunities (Wiltbank et al., 2006), leaving little time for thorough analysis as textbooks teach. The entrepreneur then needs to base his response on experience and scarce information, adopting a more effectual approach.

Though the body of research on effectuation is growing, with more than 120 articles published on effectuation from 1999 to 2011, most of the publications are theory driven, whereas the empirical research on effectuation is limited (Ghorbel & Boujelbène, 2013). Furthermore, most contributions to the existing empirical work on effectuation are based on data gathered in the United States. More empirical research on the use of causational and effectual principles by expert entrepreneurs outside of the United States is therefore required. In order to do this, an in depth knowledge of

expertise and what makes an entrepreneur an expert entrepreneur is necessary (Perry, Chandler, & Markova, 2012).

## 1.6 Expertise

Research on expertise has been a scientific topic of interest since 1973, when Chase and Simon committed themselves to comprehend the nature of chess masters (Chase & Simon, 1973; Simon & Chase, 1973). They argued that chess mastery is dependent on more complex factors and had no direct correlation with intelligence. Chess mastery appeared to be correlated to how players store information, perceive problems and created solutions to those problems (Dew, Read, Sarasvathy, & Wiltbank, 2009; Ghorbel & Boujelbène, 2013).

With the promising results of Simon and Chase, the field of research on expertise expanded to more topics, including taxi driving, medicine, fire-fighting and consumer decision-making (Dew et al., 2009). Interestingly, the majority of findings in less dynamic settings proved to be equally true for more dynamic settings.

The exceptionally high task performance is consistently associated with experts as a result of them solving complex problems quicker, more accurately and with more ease (Read & Sarasvathy, 2005). It is only later that the nature of high task performance is researched in the area of entrepreneurship (Mitchell, 1994).

Experienced entrepreneurs acquire useful cognitive frameworks and scripts that enable them to become experts in entrepreneurship over time (Dew et al., 2009). Analogue to other behavioral sciences, an expert is therefore defined as “someone who has attained a high level of performance in the domain as a result of years of experience” (Foley & Hart, 1992) and deliberate practice (Ericsson, Krampe, & Tesch-Römer, 1993). Sarasvathy (2001a) argues that the expert entrepreneurs use a more effectual way of reasoning, as compared to novice or less experienced entrepreneurs.

## 1.7 General research question

The purpose of this research is to deepen the academic knowledge on the application of causational and effectual entrepreneurial processes by expert entrepreneurs outside the United Stated and compare the results with the findings of existing academic knowledge on causation and effectuation.

To conduct this research, data from expert entrepreneurs is gathered and analyzed. For the data collection, the country of choice is the Netherlands, for it being a Western

country and the seat of the University of Twente. For, as Sarasvathy (2008b) argues, the difference in the application of causation or effectuation is most notable among expert entrepreneurs, the data is gathered from entrepreneurs that measure up to the requirements set by Sarasvathy (2008a) to be considered as experts in entrepreneurship. To conduct this research, the following research question is drawn:

> *"How do Dutch expert entrepreneurs apply the principles of causation and effectuation?"*

## 1.8 Relevance of the study

Researching the use of the principles of causation and effectuation by expert entrepreneurs in other countries than the United States, contributes to solidifying the academic literature on entrepreneurship in general and entrepreneurial processes more specifically.

Deepening the academic knowledge is increasingly relevant as the interest in entrepreneurship as a field of research is growing. The findings of this research could be used to fuel further research into this topic, further expanding the body of knowledge on entrepreneurship. With greater understanding of entrepreneurs and entrepreneurial processes, possibly even textbooks could be improved, and with that entrepreneurship courses on universities.

Practical relevance is also found in the possibility to increase focused and more effective support to entrepreneurs, based on their geographical location and the principles of causation and effectuation. This increased effectiveness could have a positive influence on not only the economic wellbeing of the entrepreneurs, but also on their surroundings.

## 1.9 Outline

The thesis at hand is comprised of six chapters. After chapter one the theoretical framework can be found. Chapter two will lay the theoretical foundation on which the research is built. Chapter two will also include the formulation of the hypotheses.

In the third chapter the methodology required to execute the research is developed. This chapter will evaluate the sample and the methods of data collection and data analysis.

Chapter four presents the results of the data analysis, which, together with the discussion of the results in chapter five lead up to the final chapter, which entails the conclusion and recommendations to be drawn from the conducted research.

# 2 Theoretical framework

## 2.1 Causation and Effectuation

The theory of effectuation is inspired on Simon's (1991) remarks on the empirical validity of rational choice theory, based on cognitive bounds of the human mind (Read & Sarasvathy, 2005). Simon actively contributed to the effectuation theory by closely collaborating with Sarasvathy on the creation of the theory (Sarasvathy & Simon, 2000).

Causation and effectuation are both entrepreneurial processes. Causation is based on the rational choice theory and as Sarasvathy (2001a, p. 245) describes it, "Causation processes take a particular effect as given and focus on selecting between means to create that effect". Effectuation is the complete inverse of rational choice theory. According to Sarasvathy (2001a, p. 245), "Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means". Where causation is based on the logic of prediction, following the logic that to the extent we can predict the future, we can control it, effectuation is on the other end, the logic of non-predictive control, following the logic that to the extent we can control the future we do not need to predict it (Read & Sarasvathy, 2005).

Causal reasoning assumes that one does not, or to a limited extent, have control over the environment and should try to predict it and adapt to its changes. Causal reasoning is oriented on setting goals and finding the means to accomplish those goals. Effectual reasoning on the other hand assumes that one can exhort a certain amount of control on the environment and is able to take actions according to that. Effectuation reasoning is therefore oriented on the available set of means and the possible set of goals that can be derived from that (Read & Sarasvathy, 2005). This main difference is visualized in Figure i.

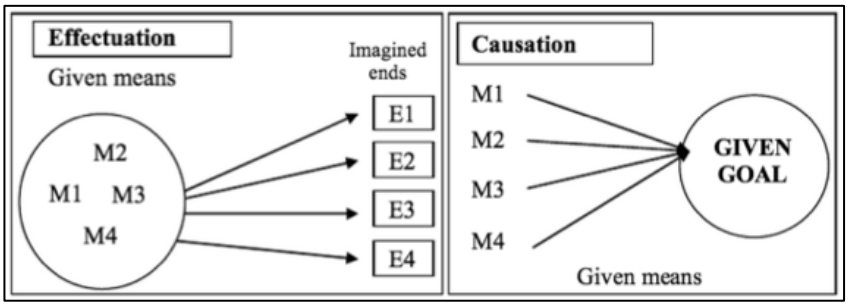


*Figure i: Effectuation versus causation (Sarasvathy, 2001a)*

When comparing effectuation to the literature of opportunity recognition, effectuation is not only connected to the identification and pursuit of opportunities, it also includes opportunity creation as part of the implementation of the entrepreneurial process (Sarasvathy, 2001b). The heuristics behind the effectual processes are captured by Sarasvathy (2001a) in a set of five “principles of entrepreneurial expertise”; 1) Means-based, 2) Affordable loss, 3) Strategic alliances, 4) Exploitation of contingencies, and 5) Control of an unpredictable future. These principles are explicated in short in Figure ii.

**Effectuation principle 1: Means-based**

The emphasis of this principle is on utilizing the existing means, which are divided into three categories of means; what you already have, what you already know and who you already know, and putting these assets to work to create something new rather than discovering new ways to achieve predefined goals.

What you have is about the logic of identity, defining an individual. Identity-based criteria are specific to an individual, like the fact that the individual is an entrepreneur, or from other areas in life, such as religious faith, political affiliations, childhood traumas, aesthetic pursuits or loyalty to certain associations (Sarasvathy & Dew, 2005). What you know is about the logic of action. Expert entrepreneurs tend to eschew predictive information as much as possible and instead rely on taking direct action (Sarasvathy & Dew, 2005). They learn by doing, not doing what they were taught.

Who you know is about the logic of making commitments with people you already know. The meaningfulness and usefulness of purposes are fashioned based on who comes on board and what they are willing to commit in order to shape those purposes. This principle is popularly known as the *bird-in-hand* principle.

**Effectuation principle 2: Affordable loss**

The emphasis of this principle is on calculating downside risk potential and on risking no more that you can afford to lose by committing in advance to what one is prepared to lose rather than investing in calculating expected returns.

**Effectuation principle 3: Strategic alliances**

The emphasis of this principle is on the negotiation with outside stakeholders about making commitments without conducting an elaborate competitive analysis or worrying about opportunity costs. Stakeholders work together in determining the goals.

Knowledge is shared among the committed shareholders. This principle is popularly known as the *crazy-quilt* principle.

**Effectuation principle 4: Exploitation of contingencies**

The emphasis of this principle is on making use of surprises by taking an action oriented stance in acknowledging and appropriating the contingency rather than trying to avoid, overcome or adapt to surprises. This principle is popularly known as the *lemonade* principle.

**Effectuation principle 5: Control of an unpredictable future**

In this principle, the human agency is the prime driver of opportunity rather than focusing primarily on other factors such as technological trajectories. This principle is popularly known as the *pilot-in-the-plane* principle.

| *Principles of effectuation* | *Explication* |
|---|---|
| 1 *Means-based* | *Means.* The basis for decisions and new opportunities:<br>- Who I am<br>- What I know<br>- Whom I know |
| 2 *Affordable loss* | Calculate downside potential and risk no more than you can afford to lose |
| 3 *Strategic alliances* | This principle involves negotiating with stakeholders who are willing to make actual commitments to the project, without worrying about opportunity costs, or carrying out elaborate competitive analyses |
| 4 *Exploitation of contingencies* | Leverage contingency. Effectuation is action oriented |
| 5 *Control of an unpredictable future* | Relying on and working with human agency as the prime driver of opportunity |

*Figure ii. Principles of effectuation. (Sarasvathy, 2008a)*

The effectual process, visualized in Figure iii, incorporates the five principles of effectuation in a continuous cycle (Read & Sarasvathy, 2005). In this continuous cycle, the effectual entrepreneurs ("effectuators") start with the means available ('*Who I am, What I know, Whom I know*', effectuation principle 1) and form with the means available a list of what they can do ('*What can I do*'). With that list, the effectuator will move into negotiating a series of pre-commitments ('*Interact with people I know*') in

order to '*obtain stakeholder commitments*' (effectuation principle 3). Depending on who joins the venture and on other contingencies along the way, two different cycles are set in motion to exploit these contingencies (effectuation principle 4) and focusing on those elements that the effectuator and stakeholders can actually control at any given point in time (effectuation principle 5). The first is an '*expanding cycle of resources*' available to the venture, the second is a '*converging cycle of constraints'*, accreting into specific goals over time, dependent on what the effectuator can afford to invest in time, money and emotion (effectuation principle 2).

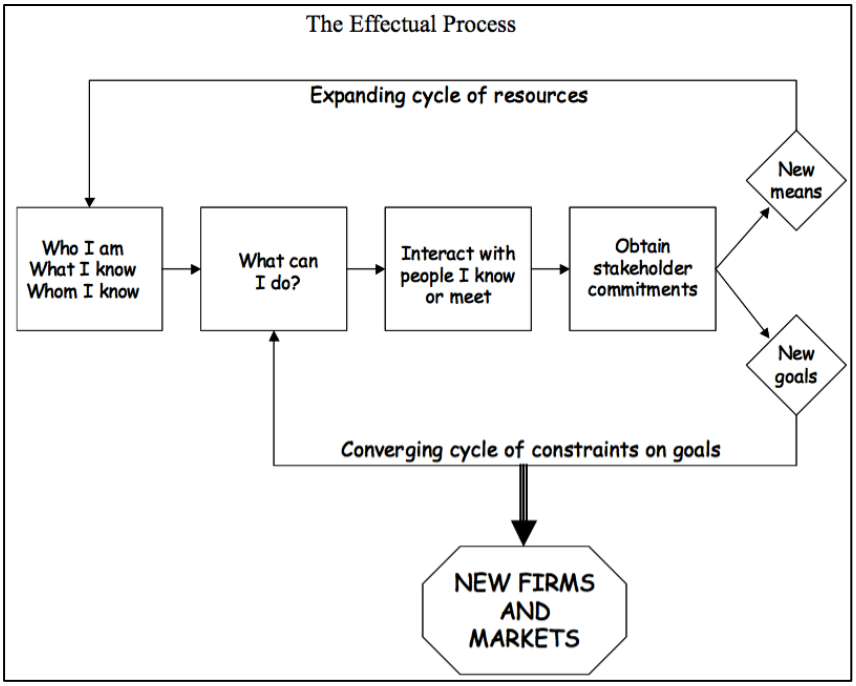


*Figure iii. The effectual process (Read & Sarasvathy, 2005)*

## 2.2 Expertise

In the academic world, there is a widespread agreement about the contextual nature of expertise (Dew et al., 2009). A firefighter might be the best in in the field of firefighting, but the same time a poor cook in the kitchen. Expertise research therefore studies experts in their own context. Experts are defined as "someone who has attained a high level of performance in the domain as a result of years of experience and deliberate practice" (Ericsson et al., 1993; Foley & Hart, 1992).

Ericsson and Smith (1991) point out that consistent superior performance is not accounted for by just an accumulation of experience and knowledge, but behind it hides a more complex system. To make way into researching this complex system and how to attain reproducible superior performance, they suggest designing laboratory

tests to replicate the superior performance in stable, reliable conditions. This way, its structure can be examined and analyzed, revealing the mechanics of superior performance that makes one an expert in his respective field. In Figure iv, laboratory tasks for respectively the domains of chess, typing, and music are shown to exemplify the laboratory testing of expertise.

| Domain | Presented Information | Task |
|---|---|---|
| Chess |  | Select the best chess move for this position |
| Typing |  | Type as much of the presented tekst as possible within one minute |
| Music |  | Play the same piece of music twice in the same manner |

*Figure iv: Examples of laboratory tasks for capturing constantly superior performance (Ericsson, 2008)*

Analyzing many different domains, Ericsson (2008) has been able to observe consistent patterns of performance level over time, concluding that “all performers, even the most “talented”, need around 10 years of intense involvement before they reach an international level in established sports, sciences, and art” (Ericsson, 2008, p. 990) The gradual increase in expert performance as a function of time is displayed in Figure v, showing the international (expert) level to be attained after about 10 years.

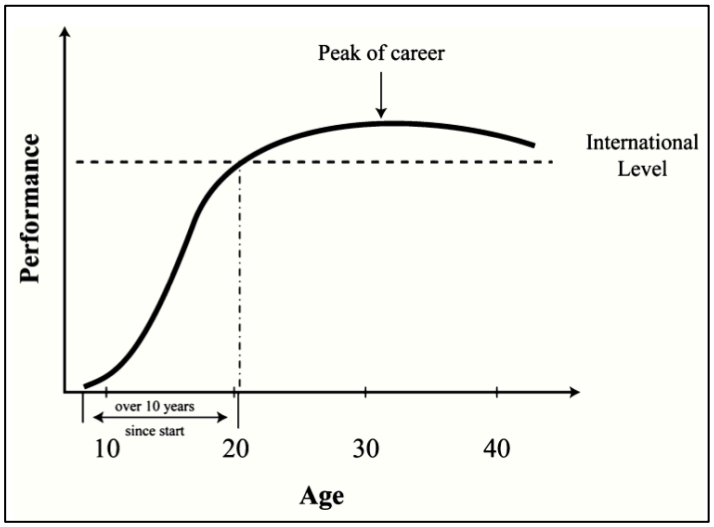


*Figure v: Increase in expert performance as a function of time (Ericsson, 2008)*

In the domain of entrepreneurship, Mitchell (1994) was the first to encourage studying entrepreneurship as a form of expertise. Since then, a multitude of studies have been conducted on the subject of entrepreneurial expertise (Baron & Ensley, 2006; Dew et al., 2009). Like in other domains, expertise in entrepreneurship is strongly connected to intense involvement, or deliberate practice (Baron & Ensley, 2006).

Sarasvathy (2001a) argues that as a result of their deliberate practice, expert entrepreneurs design their decision-making in a way that inverts common principles in causal theories of entrepreneurship and strategic management. Adding to that, the traditional management techniques taught in business schools are based on a causal logic (Dew et al., 2009). Novices are mainly trained in this causal logic, using a different logical decision-making frame and a different set of heuristics in that frame than expert entrepreneurs, who are experienced in creating new ventures and new markets (Dew et al., 2009).

## 2.3 Novice and Expert entrepreneurs

Dew et al. (2009) conclude a number of significant differences between novice and expert entrepreneurs, on a general level and on an entrepreneurial level. On the general level, expert entrepreneurs – compared to novices – 1) reason more from small quantities of available data, 2) see problem tasks in a more holistic fashion and 3) discard or ignore predictive information, such as market research. On the entrepreneurial level, expert entrepreneurs – compares to novices – 4) are more likely to draw on their means as opposed to a goal-oriented action, 5) tend to focus more on making the most of limited resources available as opposed to chasing the largest

expected return. Finally, 6) expert entrepreneurs are more likely to lay a focus on forming a network of partnerships.

## 2.4 Hypotheses

The data on which Sarasvathy and her co-authors developed the theory of effectuation has been gathered in the USA. It will expand on this work by gathering data from another country to investigate the application of effectual and causational principles among expert entrepreneurs in that country, and compare the outcomes with Sarasvathy (2001b) findings to see whether those findings hold in other countries than the USA.

To investigate whether expert entrepreneurs use a more effectual reasoning outside the USA, the following hypotheses are formulated, based on the principles of effectuation:

> H1: *Dutch expert entrepreneurs use a more means-based than goal-based approach to decision making.*
>
> H2: *Dutch expert entrepreneurs focus more on the affordable loss than the expected returns.*
>
> H3: *Dutch expert entrepreneurs make more use of forming alliances and partnerships instead of conducting competitive analysis.*
>
> H4: *Dutch expert entrepreneurs make more use of the exploitation of contingencies instead of relying on existing market knowledge.*
>
> H5: *Dutch expert entrepreneurs focus more on trying to control the future instead of trying to predict the future*.

These hypotheses are tested against the null hypothesis of there being no significant difference in the application of causation and effectuation by Dutch expert entrepreneurs.

When hypotheses appear to be true, further investigation will provide more insight into the meaning and implications of the hypotheses.

# 3 Methodology

This chapter elaborates on the research methods, the sampling, and how the data is analyzed in order to provide a significant answer to the research question at hand. Two different research methods were used to collect data. The first method is conducting a case interview according to the think aloud method. The second method entails a survey research.

## 3.1 Think aloud method

Using think aloud method, the respondent is requested to think out loud while formulating an answer on a given problem or question. In this way, the respondent verbalizes the normal series of thoughts so that the interviewer is able to record these. “Under this condition, the subject will verbalize their thoughts as these enter consciousness, that is, when they are first needed” (Ericsson & Simon, 1985, p. 3). The think aloud method is nowadays seen as a generally accepted and useful method of gathering data. It increases the amount of observed cognitive information and behavior compared to other methods (Ericsson et al., 1993; Sarasvathy, 2008a). With the think aloud method, even a small number of participants can provide a rich and extensive set of data for analysis (Nielsen, 1994). The validity of the think aloud method derives from it immediacy. The time lag between the thoughts occurring and verbalizing them is very small, minimizing the occurrence of a retrospection and introspection biases (Dew et al., 2009).

The role of the interviewer when using the think aloud method is different from other verbal data gathering techniques. The think aloud method requires that there are no interruptions or questions when the respondent is in the process of answering a case problem. This is imperative to avoid interpretation or explanation from the interview and to assure the respondent reflects an accurate account of his thoughts (Van Someren, Barnard, & Sandberg, 1994). In the case presented to the subjects (see Appendix A: Business Case (Dutch)), the subjects follow the path towards setting up and expanding a coffee corner business. They do this by being confronted with 10 problems (Table i) along the way on which the respondent is asked to think aloud while solving or answering the problem.

| Case Problem | Challenge |
|---|---|
| Problem 1 | Identifying the market |
| Problem 2 | Defining the market |
| Problem 3 | Meeting Payroll |
| Problem 4 | Financing |
| Problem 5 | Leadership/Vision |
| Problem 6 | Product Re-development |
| Problem 7 | Growing the Company |
| Problem 8 | Hiring Professional Management |
| Problem 9 | Goodwill |
| Problem 10 | Exit |

*Table i: Case problems in the think aloud case*

## 3.2 Survey research

Next to applying the think aloud method, survey research is conducted in order to provide reliability to the research. The subjects are asked to fill out a questionnaire about their general entrepreneurship experiences, with the focus on their current real-life business. The answers are given on a five-point Likert scale, ranging from “Do not agree” to “Fully agree” This questionnaire is made by Chandler, DeTienne, McKelvie, and Mumford (2011) and serves as a comparison with the protocols of the think aloud sessions, to validate whether the entrepreneur is consistent in his/her behavior and decision making. Second, the subjects are asked to fill in biographic information, which is used to identify possible relations between the decision making of the subject and his/her biographic data, such as gender and age. The questionnaires are attached in Appendix B: Questionnaires.

## 3.3 Sampling

For this research, the sample consists of 20 Dutch expert entrepreneurs. For the sample to find possible correlation, Nielsen (1994) suggests that less than 10 subjects should already be enough to yield significant information. The location of these expert entrepreneurs is spread across the Netherlands, with expert being defined as “someone who has attained a high level of performance in the domain as a result of years of experience” (Foley & Hart, 1992) “and deliberate practice” (Ericsson et al., 1993). The entrepreneurs fall in the category ‘expert’ because of the experience they have in entrepreneurship. On average, they have been an entrepreneur for 23,25 years, ranging from 7 years up to 57 years of entrepreneurial experience. 19 out of 20 entrepreneurs have more than the 10 years’ experience in deliberate practice that Simon and Chase (1973) argue to be required for a novice to become an expert (in this

instance in entrepreneurship). In Table ii, the sample distribution of the biographic information is displayed.

The sample is heterogeneous, with the subjects not only from across the Netherlands, but also from different educational and family backgrounds. The educational background includes studies such as business studies, social studies, IT, engineering, and psychology. Half of the subjects are in the possession of a master's degree, while about a third holds a bachelor's degree. The age of the subjects ranges from 29 to 73 years, with an average age of 53 years. Considering the family background, more than half of the subjects is atheist, while the other half is protestant or catholic. Also, well over half of the subjects is married. Interesting is that of half of the entrepreneurs, at least one of the parent has also been an entrepreneur. The parents income was pretty evenly distributed among the lower quartile, middle half and upper quartile, with slightly more entrepreneurs whose parents' income was situated in the middle half.

**Sample distribution of the bio variables**

**Age**

| | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| Years | 29 | 73 | 53,31 | 11,05 |

**Years of entrepreneurship**

| | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| Years | 7 | 57 | 23,25 | 14,063 |

**FTE in current company**

| | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| FTE | 3 | 400 | 92,29 | 127,806 |

**Annual turnover in current company**

| | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| € | € 100.000 | € 220.000.000 | € 34.750.000 | € 68.010.308 |

**Study Background**

| | Business Study | Social Sciences | Engineering- non IT | Other | Total |
|---|---|---|---|---|---|
| Percent | 37,50% | 6,30% | 18,80% | 37,50% | 100,00% |

**Current academic level**

| | Bachelor | Master | Other | Total |
|---|---|---|---|---|
| Percent | 50,00% | 31,30% | 18,80% | 100,00% |

**Sex**

| | Male | Female | Total |
|---|---|---|---|
| Percent | 87,50% | 12,50% | 100,00% |

**Religion**

| | None / Atheist | Christian Protestant | Christian Catholic and other christian | Total |
|---|---|---|---|---|
| Percent | 56,30% | 18,80% | 25,00% | 100,00% |

**Children**

| | No | Yes | Total |
|---|---|---|---|
| Percent | 12,50% | 87,50% | 100,00% |

**Marital status**

| | Single | Living together | Married | Total |
|---|---|---|---|---|
| Percent | 18,80% | 12,50% | 68,80% | 100,00% |

**Parent Income**

| | Lower Quartile | Middle Half | Upper Quartile | Total |
|---|---|---|---|---|
| Percent | 25,00% | 43,80% | 31,30% | 100,00% |

**Family Background**

| | Entrepreneur / self employed | Private Company | Public servant | Other | Total |
|---|---|---|---|---|---|
| Percent | 50,00% | 25,00% | 18,80% | 6,30% | 100,00% |

**Company type of business**

| | Sales (retail and wholesale) | IT and IT services | Consulting services | Other services | Manufacturing | Total |
|---|---|---|---|---|---|---|
| Percent | 15,00% | 10,00% | 20,00% | 20,00% | 35,00% | 100,00% |

*Table ii: Sample distribution of the biographic information*

## 3.4 Data analysis

The think aloud sessions were recorded and transcribed in a transcript, which is coded and consequently analyzed. Writing out the recordings is imperative, for “it is simply more difficult to get an overview over audio recordings and it is more difficult to retrieve fragments from an audio recording” (Van Someren et al., 1994, pp. 119-120). The transcriptions of the recordings are to be done as accurate as possible, including silences and unfinished sentences to avoid unjust interpretation by the transcriber and ensure an unbiased written transcript of the think aloud session.

### 3.4.1 Coding

In order to be able to analyze the cognitive processes captured in the protocols, the next step is to compare the protocols to a pre-defined coding scheme (Van Someren et al., 1994). Those parts of the protocol that reflect a predefined code are labeled with the associated code.

For coding the protocols, the coding legend of Sarasvathy (2008a, p. 55) is applied, which is shown in Table iii.

| Causation legend | Effectuation legend |
|---|---|
| G Goal-driven | M Means-based |
| R Expected return | L Affordable loss |
| B Competitive analysis | A Use of alliances |
| K Existing market knowledge | E Exploitation of contingencies |
| P Predictions of the future | C Control by prediction |
| X Causal | N Effectual |

*Table iii: Coding scheme (Sarasvathy, 2008a, p. 55)*

To ensure the protocols to be coded accurately and as objective as possible, the researcher and an independent party separately code the same protocol and compare the codings on similarities and differences. With the findings of the first coding, they separately code another protocol and compare these codings again on similarities and differences. This process continues until the compared codings are equal or above 65% consistent with each other, indicating a good inter-rater reliability (Dew et al., 2009; Van Someren et al., 1994).

Next to the codings, the conducted surveys are analyzed on effectual and causational reasoning. The subjects answered the questions in the questionnaire according to a 5-point Likert-scale, ranging from ‘Do not agree’ to ’Fully agree’. The questions are sorted on effectual or causal reasoning, thus answering these questions with ‘Do not agree’ or ‘Fully agree’ or anywhere in-between gives information about the used effectual of causal reasoning.

### 3.4.2 Method of analysis

The main goal is to verify whether Dutch expert entrepreneurs tend to significantly use a more effectual way of reasoning than a causal way of reasoning, and if that is the case, to what extent. Furthermore, the goal is to investigate through analysis which principles of causation and effectuation are most commonly used by expert entrepreneurs. The analyzed dimensions will be according to the principles described

in the coding legend: *Goal-driven* versus *Means-based*, *Expected returns* versus *Affordable loss*, *Competitive analysis* versus *Use of alliances*, *Existing market knowledge* versus *Exploitation of contingencies*, and *Predictions of the future* versus *Control by prediction*. As almost no scores are given on the non-subcategorial causal and effectual dimensions, and therefore almost no data is available about these, the dimensions Causal and Effectual (respectively codes X and N in the coding scheme) are not included in the analysis, focusing on the dimensions as defined by Sarasvathy (2008a).

For the analysis of the think aloud data, the data of the codings is transformed into shares of causation and effectuation, for each issue (principle) and in total. The share of effectuation is the inverse of the share of causation ($share_{effectuation} = 1 - share_{causation}$).

**Test of Normality**

To test whether the sample is normally distributed, the shares of causation and effectuation are tested on normality. The Shapiro-Wilk test of normality is preferred instead of the Kolmogorov-Smirnov test of normality. The Shapiro-Wilk is more sensitive, meaning it will incorrectly reject the null hypothesis less often, and is suitable for smaller sample sizes. If the Shapiro-Wilk test shows no significant outcome, (significant at $p < 0,05$), the data is assumed to be normally distributed.

**One-sample T-test**

To investigate whether significantly more effectual reasoning is used by the expert entrepreneurs, the hypotheses are tested on the shares with a one sample T-test. By default, the share of applied effectuation is assumed to be equal to the share of applied causation, which implies that both the share of causation and the share of effectuation are at 50%. A significant deviation from the 50% share implies that either a more causational or more effectual approach is adopted. The direction of the mean will then show whether the expert entrepreneurs use a significantly more effectual or a more causal reasoning. Also, the use of causation and effectuation is examined for each separate case problem, with the ten case problems ranging from setting up and expanding a coffee corner business to selling the business (Appendix A: Business Case (Dutch).

**Correlation matrix**

To support the findings, the codings are compared to the survey results on similarity in effectual and causal reasoning, This is done by means of a correlation matrix, to

discover any correlation between the different case problems and principles, as well as possible correlation between the think aloud data and the survey data. A correlation between the think aloud data and the survey data enhances the reliability of the data.

**Control variables**

To rule out the influence of the results by other independent variables, the data is checked with the control variables Age, Sex, Children, Marital status, Parent income, Family background, and Religion. To verify which control variables are most likely to influence the use of causation and effectuation, first a correlation matrix is conducted. To analyze possible relationships between dependent variables and independent variables, a chi squared test or a regression analysis can be conducted. The chi squared test identifies whether there is a significant relationship between dependent variables and independent variables in the whole of the data, whereas a regression analysis is able to point out which relationship between a dependent and independent variable is significant. This makes the regression analysis more accurate, and more suitable for smaller sample sizes. For the sample size of this research is rather small, the regression analysis is more appropriate to test the influence of independent control variables on the dependent variables.

**Factor analysis**

In order to explore the underlying dimensionality of the survey items, an exploratory factor analysis is conducted. First, the Cronbach's alpha is measured to determine the internal consistency reliability of the causal and the effectual survey questions. When the alpha is 0,7 or more, the data is considered internal consistent. Next, the factorability of the data is assessed using both the Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure. The Bartlett's test of sphericity tests whether each variable correlates with itself and not with other variables. The outcome is significant if the p-value is lower than alpha (0,05). The KMO measure of sampling adequacy tests whether it is appropriate to execute a factor analysis on the data. When the outcome of the KMO measure is between 0,5 and 1, executing a factor analysis on the data is appropriate.

To determine the number of factors to extract from the data and use in the factor analysis, a parallel analysis is conducted by means of a Monte Carlo simulation and a scree analysis of the eigenvalues (Cattell, 1966; Chandler et al., 2011; Horn, 1965). Parallel analysis is a suitable method for factor extraction for it takes in account the biasing influence of sampling error (Chandler et al., 2011).

Considering Sarasvathy (2001a), who argues that causation and effectuation are two fundamental different approaches into problem-solving, we expect to find a two distinct factors. Chandler et al. (2011) though, found the causational items to indeed load on one factor, but the effectual items to load on multiple factors, retaining a total of three factors on effectuation. Furthermore, Chandler concluded effectuation to be a multidimensional construct.

# 4 Results

This chapter describe the results of the data analysis following the previous chapter, Methodology. First the results of the Think Aloud data are presented, next the results of the survey data. The results are interpreted in the next chapter, Conclusions.

## 4.1 Results of Think Aloud sessions

The results of the analysis of the Think Aloud data are divided into determining the inter-rater reliability, the distribution figures, the test of normality, the one-sample T-test, checking the influence of independent control variables and the correlation between the principles.

### 4.1.1 Inter-rater reliability

To enhance the objectivity of the think aloud codings, the inter-rater reliability has been determined. After the first compared coding, the inter-rater reliability was less than the required 65% (Dew et al., 2009; Van Someren et al., 1994). After the second compared coding, the inter-rater reliability was determined to be at 80%. The think aloud codings are therefore deemed objective enough to rule out the bias of subjective coding

### 4.1.2 Distribution of causation and effectuation

In Figure vi and Figure vii, an overview is given of the distribution of the use of causation and effectuation. Figure vi shows the distribution of causation and effectuation among the different issues, in % of the total of respectively causation and effectuation. The majority of the effectual statements are means-based statements (57%), whereas the majority of the causal statements are statements about expected returns (37%) and goal-driven statements (21%).

Noteworthy in Figure vi is the very large share of effectuation on the issue of Action, the large share of causation on the issue of Risk, the exact on par with the total average share of causation and effectuation on the issue of Outsiders and the close to equal shares of causation and effectuation on the issues of Contingencies and Future.

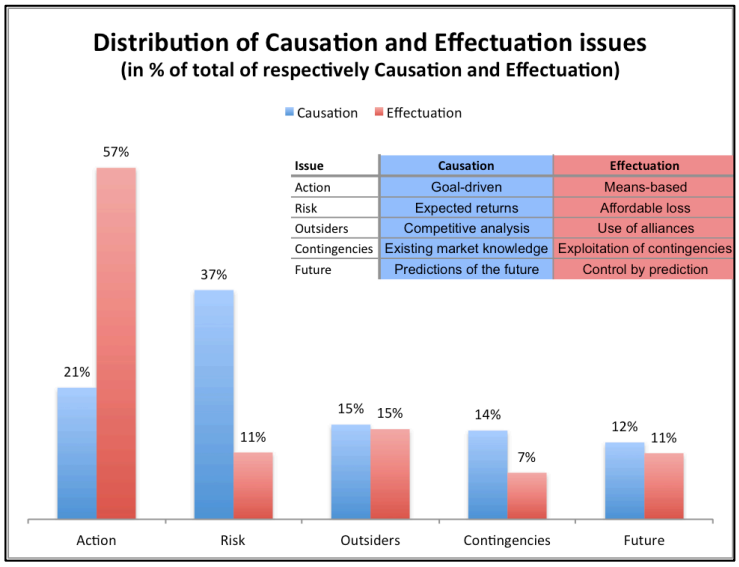


*Figure vi: Distribution of Causation and Effectuation issues*

Figure vii shows the distribution of causation and effectuation as a share of the total. The total share of effectuation is 67%, leaving the share of causation at 33%. Noteworthy are the largely effectual results on the Action issue and the predominantly effectual results on the issue of Outsiders and causal results on the issue of Risk. On the issues of Contingencies and Future, there seems to be no predominance of either effectuation or causation.

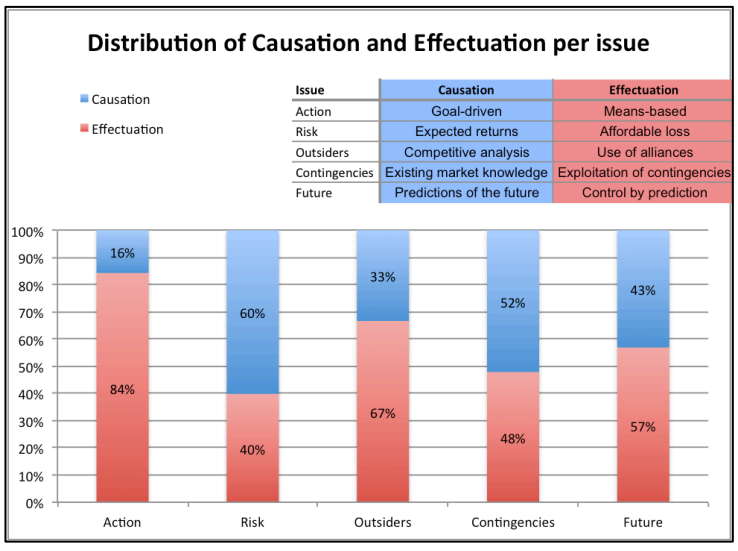


*Figure vii: Distribution of Causation and Effectuation per issue*

### 4.1.3 Test of Normality

The shares of causation and effectuation are tested on normality, using the Shapiro-Wilk test of normality. As shown in Table iv and Table v (last column), none of the shares are significant (significant at $p > 0,05$) according to the Shapiro-Wilk test. Therefore all shares are assumed to be normally distributed.

**Tests of Normality for shares of total**

| | Shapiro-Wilk | | |
|---|---|---|---|
| | Statistic | df | Sig. |
| Share causation (%) total | ,953 | 20 | ,422 |
| Share effectuation (%) total | ,953 | 20 | ,422 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

*Table iv: Test of Normality on total shares of causation and effectuation*

**Tests of Normality for shares of issues**

| | Shapiro-Wilk | | |
|---|---|---|---|
| | Statistic | df | Sig. |
| Share of Goal-driven (%) (causation) | ,951 | 20 | ,376 |
| Share of Means-based (%) (effectuation) | ,951 | 20 | ,376 |
| Share of Expected returns (%) (causation) | ,953 | 20 | ,411 |
| Share of Affordable loss (%) (effectuation) | ,953 | 20 | ,411 |
| Share of Competitive analysis (%) (causation) | ,974 | 20 | ,834 |
| Share of Partnerships & alliances (%) (effectuation) | ,974 | 20 | ,834 |
| Share of Existing market knowledge (%) (causation) | ,929 | 20 | ,148 |
| Share of Exploring contingencies (%) (effectuation) | ,929 | 20 | ,148 |
| Share of Prediction of the future (%) (causation) | ,936 | 20 | ,205 |
| Share of Non predictive control (%) (effectuation) | ,936 | 20 | ,205 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

*Table v: Test of Normality on shares of causation and effectuation*

### 4.1.4 One-sample T-test

To investigate whether expert entrepreneurs use a significantly more effectual reasoning, the overall shares are tested with a one sample T-test. The test is significant when *p* is at or below 0,05. The tests are also conducted for each of the 10 case problems.

For the share of effectuation is the inverse of the share of causation ($share_{effectuation}$ = 1 - $share_{causation}$), the shares of causation and effectuation related to the same issue present the same test result (see Table vi). For more detailed results of the one-sample T-Test on the overall shares, see Appendix C: One-sample T-tests (detailed).

| T-Test | (Causation)<br>(Effectuation) | One-Sample Statistics | | | One-Sample Test<br>Test Value = 0.5 |
|---|---|---|---|---|---|
| Issue | | N | Mean | Std. Deviation | Sig. (2-tailed) |
| Action | Share of Goal-driven | 20 | 0,1573 | 0,06459 | 0,000 |
| | Share of Means-based | 20 | 0,8427 | 0,06459 | 0,000 |
| Risk | Share of Expected returns | 20 | 0,6015 | 0,21646 | 0,050 |
| | Share of Affordable loss | 20 | 0,3985 | 0,21646 | 0,050 |
| Outsiders | Share of Competitive analysis | 20 | 0,3336 | 0,17896 | 0,001 |
| | Share of Partnerships & alliances | 20 | 0,6664 | 0,17896 | 0,001 |
| Contingencies | Share of Existing market knowledge | 20 | 0,5213 | 0,32092 | 0,770 |
| | Share of Exploring contingencies | 20 | 0,4787 | 0,32092 | 0,770 |
| Future | Share of Prediction of the future | 20 | 0,4312 | 0,22575 | 0,189 |
| | Share of Non predictive control | 20 | 0,5688 | 0,22575 | 0,189 |
| | | | | | |
| Total Think Aloud | Share of Causation | 20 | 0,3266 | 0,07328 | 0,000 |
| | Share of Effectuation | 20 | 0,6734 | 0,07328 | 0,000 |

*Table vi: Results of one-sample T-test on issues and total think aloud data*

The results show that on the issues of Action and Outsiders, the difference between the use of causation and effectuation is very significant. On the issue of Risk, the difference is only just significant. The difference is not significant on the issues of Contingencies and Future. On the total data of the think aloud sessions, the difference in the use of causation and effectuation is very significant, towards the use of effectuation.

The direction of the mean (Figure viii) indicates whether more use of causation or effectuation occurred. This shows that on the issue of Action, the expert entrepreneurs used more effectual way of reasoning (means-based), as is the case on the issue of Outsiders (Partnerships & alliances). On the issue of Risk, the expert entrepreneurs used a more causal approach.

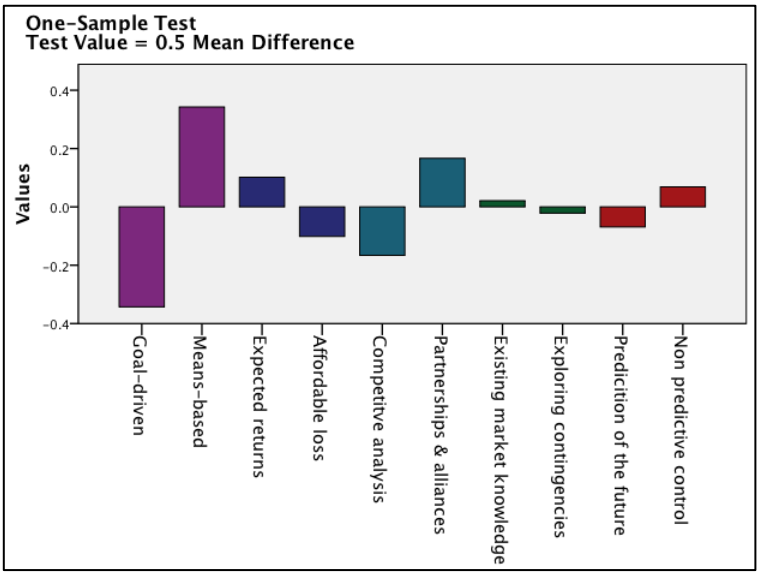


*Figure viii: Visualization of the direction of the mean and the mean difference*

For the shares per case problem, the share of effectuation too is the inverse of the share of causation ($share_{effectuation}$ = 1 - $share_{causation}$). Therefore, the shares of causation and effectuation related to the case problem present the same test result (see Table vii). For more detailed results of the one-sample T-Test on the shares per case problem, see Appendix C: One-sample T-tests (detailed).

| T-Test | (Causation) / (Effectuation) | One-Sample Statistics | | | One-Sample Test |
|---|---|---|---|---|---|
| Case Problem | | N | Mean | Std. Deviation | Test Value = 0.5 Sig. (2-tailed) |
| 1 - Identifying the market | Share of Causation | 20 | 0,5565 | 0,16906 | 0,151 |
| | Share of Effectuation | 20 | 0,4435 | 0,16906 | 0,151 |
| 2 - Defining the market | Share of Causation | 20 | 0,3822 | 0,12234 | 0,000 |
| | Share of Effectuation | 20 | 0,6178 | 0,12234 | 0,000 |
| 3 - Meeting Payroll | Share of Causation | 20 | 0,2679 | 0,29310 | 0,002 |
| | Share of Effectuation | 20 | 0,7321 | 0,29310 | 0,002 |
| 4 - Financing | Share of Causation | 20 | 0,3776 | 0,21189 | 0,018 |
| | Share of Effectuation | 20 | 0,6224 | 0,21189 | 0,018 |
| 5 - Leadership/Vision | Share of Causation | 20 | 0,1071 | 0,17717 | 0,000 |
| | Share of Effectuation | 20 | 0,8929 | 0,17717 | 0,000 |
| 6 - Product Re-development | Share of Causation | 20 | 0,3042 | 0,17651 | 0,000 |
| | Share of Effectuation | 20 | 0,6958 | 0,17651 | 0,000 |
| 7 - Growing the Company | Share of Causation | 20 | 0,2822 | 0,19573 | 0,000 |
| | Share of Effectuation | 20 | 0,7178 | 0,19573 | 0,000 |
| 8 - Hiring Professional Management | Share of Causation | 20 | 0,1313 | 0,17078 | 0,000 |
| | Share of Effectuation | 20 | 0,8687 | 0,17078 | 0,000 |
| 9 - Goodwill | Share of Causation | 20 | 0,2239 | 0,20753 | 0,000 |
| | Share of Effectuation | 20 | 0,7761 | 0,20753 | 0,000 |
| 10 - Exit | Share of Causation | 20 | 0,4233 | 0,29619 | 0,261 |
| | Share of Effectuation | 20 | 0,5767 | 0,29619 | 0,261 |

*Table vii: Results of one-sample T-test per case problem*

The results show that in problem 2 to 9, the difference between the use of causation and effectuation is very significant. In problems 1 and 10, the difference is not significant.

The direction of the mean (Figure ix) indicates whether more use of causation or effectuation occurred. This shows that in all the problems where a significant difference in the use of causation and effectuation is observed, the expert entrepreneurs exhibited more use of effectuation. Large differences are found in problems 5 and 8, the challenges of respectively Leadership/Vision and Hiring Professional Management. Therefore, problems 5 and 8 are further analyzed into the use of effectuation and causation principles.

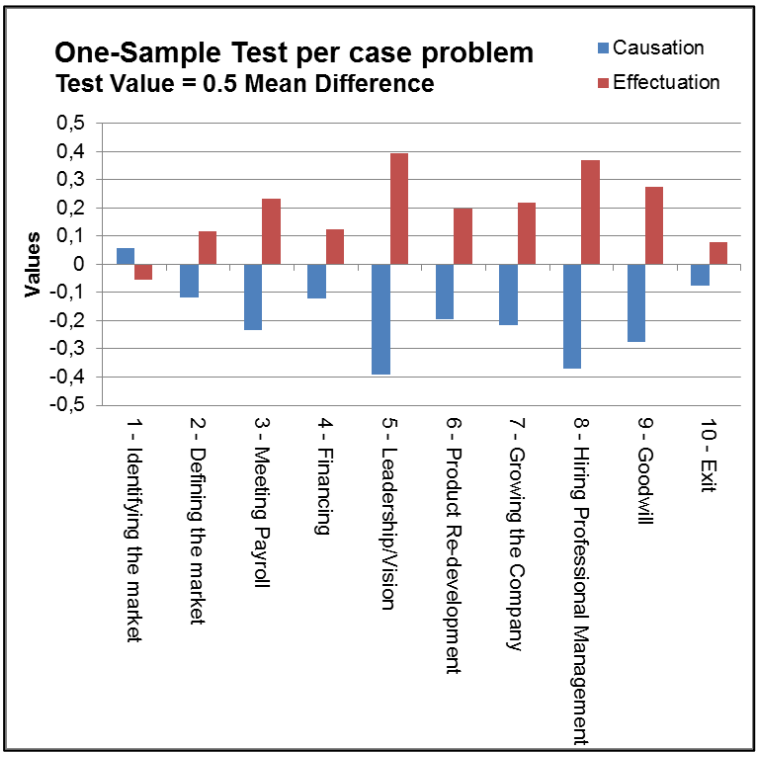


*Figure ix: Vizualisation of the direction of the mean and the mean difference for the case problems*

What is apparent in the means of the different principles in problem 5 (Figure x) and 8 (Figure xi) is the large proportion of means-based behavior, with also the large tendency to search for Partnerships & Alliances in problem 8. For more detailed results of the one-sample T-Test for case problems 5 and 8, see Appendix C: One-sample T-tests (detailed).

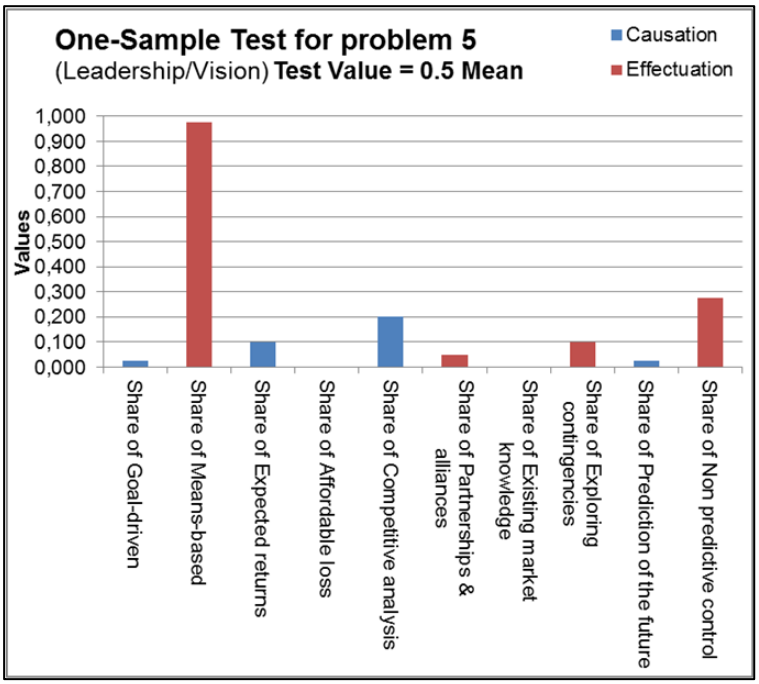


*Figure x: Visualization of the means of the issues in case problem 5*

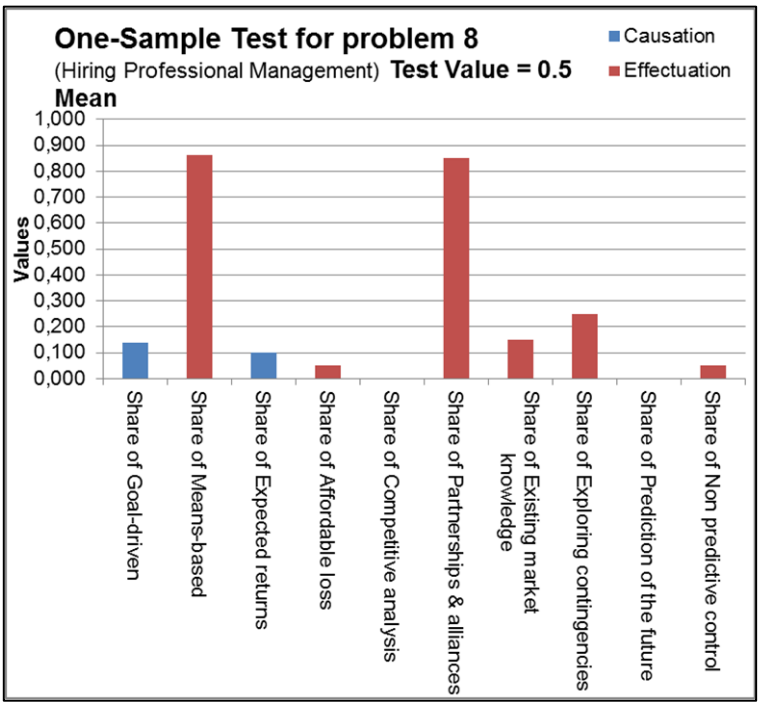


*Figure xi: Visualization of the means of the issues in case problem 8*

### 4.1.5 Hypotheses

For Hypothesis 1 (*Dutch expert entrepreneurs use a more means-based than goal-based approach to decision making*), the null hypothesis is rejected, as Table vi and Figure viii show, stating that the means-based approach is dominant among the different principles of causation and effectuation. More evidence for the use of means-based behavior is found in Figure x and Figure xi, showing a notable means-based approach to the challenges of Leadership/Vision and Hiring Professional Management.

For Hypothesis 2 (*Dutch expert entrepreneurs focus more on the affordable loss than the expected returns*), the null hypothesis is rejected (Table vi), but the mean does not point towards the focus on affordable loss, rather to the focus on expected returns (Figure viii), albeit the significance is minimal.

For Hypothesis 3 (*Dutch expert entrepreneurs make more use of forming alliances and partnerships instead of conducting competitive analysis*), the null hypothesis is rejected (Table vi), and Figure viii shows the preference to forming alliances and partnerships. This is also strengthened by Figure xi, showing a notable preference to this when it comes to hiring professional management.

For Hypothesis 4 (*Dutch expert entrepreneurs make more use of the exploitation of contingencies instead of relying on existing market knowledge*), the null hypothesis is not rejected. As Table vi shows, there is no significant difference in the application of causation and effectuation on the issue of contingencies. This is also reflected in Figure viii, showing no notable difference in exploring contingencies and exploiting existing market knowledge.

For Hypothesis 5 (*Dutch expert entrepreneurs focus more on trying to control the future instead of trying to predict the future*), the null hypothesis is not rejected, finding no significant difference in the application of a causal or effectual approach when it comes to approaching the future (Table vi). Figure viii supports this finding.

### 4.1.6 Control variables

By means of a linear regression analysis, the shares of causation and effectuation are checked on the possible influence of the independent control variables Age, Sex, Children, Marital status, Parent income, Family background, and Religion. For the share of effectuation is the invert of the share of causation, the test values are the same for the shares per issue. Therefore, the values in Table viii are presented per issue.

Only on the issue of contingencies, the control variables Sex and Religion seem to have a significant influence ($p < 0,05$). The other issues show no significant influence by the control variables and are therefore assumed to be not influenced by the control variables.

| | Issue (dependent variable) | | | | | |
|---|---|---|---|---|---|---|
| Control variable | Action | Risk | Outsiders | Contingencies | Future | Total |
| Age | 0,888 | 0,409 | 0,360 | 0,148 | 0,973 | 0,515 |
| Sex | 0,923 | 0,948 | 0,621 | 0,044 | 0,311 | 0,704 |
| Children | 0,825 | 0,496 | 0,327 | 0,836 | 0,161 | 0,994 |
| Marital status | 0,590 | 0,642 | 0,548 | 0,698 | 0,766 | 0,620 |
| Parent income | 0,478 | 0,873 | 0,290 | 0,102 | 0,160 | 0,859 |
| Family background | 0,917 | 0,621 | 0,225 | 0,119 | 0,218 | 0,873 |
| Religion | 0,727 | 0,602 | 0,640 | 0,022 | 0,880 | 0,652 |

*Table viii: Linear regression analysis on the influence of independent control variables*

### 4.1.7 Correlation between principles

As shown in 0, the Test of Normality ascertained the assumption that all shares of effectuation and causation are distributed normally. Therefore, for the correlation matrix, a parametric test can be conducted, the Pearson Correlation. The correlations between the different principles are shown in Appendix D: Correlation matrix of think aloud data. Between the causational principles of Goal-driven, Expected returns and Competitive analysis, there is a very significant ($p < 0,01$) and strong positive correlation (Pearson's $r > 0,50$ (Fields, 2005)). The effectual principle Means-based has a significant ($p < 0,05$) correlation with the causal principles Goal-driven, Expected returns and Competitive analysis. Between Means-based and respectively Goal-driven and Expected returns, the correlation has a medium positive effect ($0,3 < r < 0,5$), the correlation between Means-based and Competitive analysis has a strong positive effect. The effectual principle of Partnerships & alliances has a significant and strong positive correlation with the causal principle of Goal-driven. The effectual principle of Exploring contingencies has a siginificant and strong positive correlation with the effectual principle of Affordable loss. The effectual principle of Non-predictive control has a significant and medium positive correlation with the causal principles Goal-driven, Competitive analysis, and Existing market knowledge and a significant and strong positive correlation with the effectual principle of Means-based.

## 4.2 Results of Survey

The Cronbach's alpha of the survey data is 0,729 for the causal survey questions and 0,708 for the effectual survey questions. Both the alphas are above 0,70, meaning that the scales are internally consistent. To test the factorability of the data, the Bartlett's test of sphericity and the KMO measure are conducted. For the causal survey

questions, the Bartlett's test of sphericity gives a p-value of 0,002, which is lower than alpha (0,05) and is therefore significant. The KMO measure though is 0,360, which is lower than the boundary level, set at 0,5. Based on these results, executing a factor analysis on this data is not appropriate. For the effectual survey questions, the Bartlett's test of sphericity gives a p-value of 0,000, which makes it very significant, though the KMO measure is 0,086, which is very low in relation to the boundary level, set at 0,5. Based on these results, executing a factor analysis on this data is also not appropriate. With this in mind, the parallel analysis and scree plot are executed on the data to determine the number of factors to retain.

The parallel analysis that was run by means of a Monte Carlo simulation, run with 1000 simulations (see Appendix E: Monte Carlo simulation), yielded that at the 95$^{th}$ percentile, a total number of one factors have an eigenvalue of the raw data that is greater than the eigenvalue of the 95$^{th}$ percentile. This is also reflected in the scree plot (Figure xii, also in Appendix E: Monte Carlo simulation), where just one factor has a raw data eigenvalue (blue line) that is higher than the 95$^{th}$ percentile (yellow line).

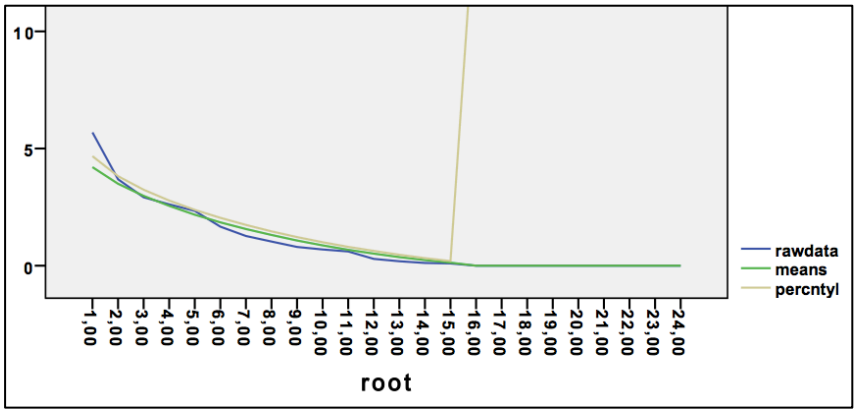


*Figure xii: Scree plot of Monte Carlo simulation*

The above implies that there is only one factor to extract and be used in the exploratory factor analysis. With this result, the Monte Carlo simulation might indicate that there might be no distinct difference in the way the survey was answered. Between factors two and five, the eigenvalue of the 95$^{th}$ percentile is only just lower than the eigenvalue of the raw data. After the fifth factor, this difference increases. This is also shown in the scree plot of the Principal Component Analysis, showing a drop after component five (Figure xiii). These results are in line with the low values of the KMO measure, indicating that the factorability of the data is low. With these results in mind, an exploratory factor analysis is conducted on the survey data, retaining five factors.

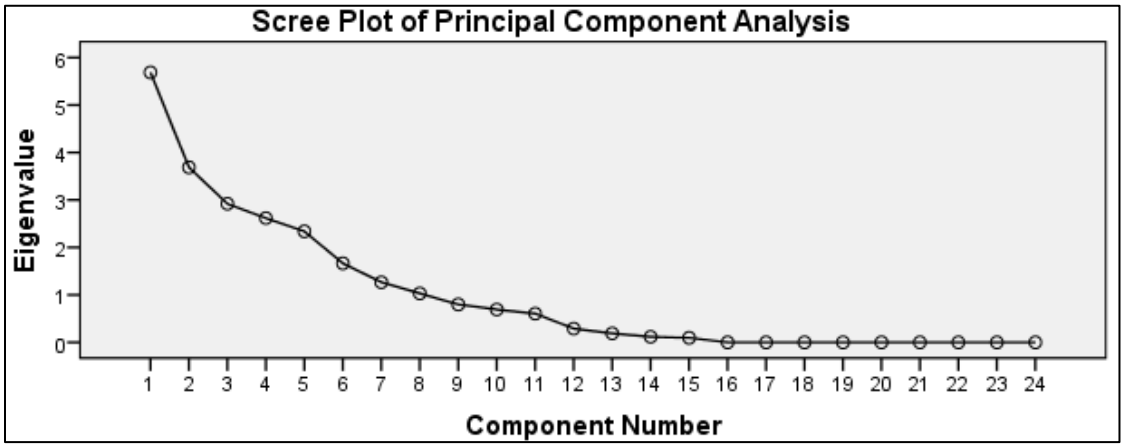


*Figure xiii: Scree plot of Principal Component Analysis*

The exploratory factor analysis (Appendix F: Exploratory Factor Analysis) confirms that there is no distinct pattern between causal and effectual questions in the survey results, with the answers on the causal and effectual questions randomly loading on the five factors.

# 5 Discussion

This thesis examined how Dutch expert entrepreneurs apply the principles of causation and effectuation and whether there is a difference in the application of these principles as compared to the research conducted by Sarasvathy (2001a) on American expert entrepreneurs.

But is the concept of effectuation itself already an established concept? As already mentioned before, the body of empirical research on effectuation is growing. Most of the publications are theory driven, whereas the empirical research on effectuation is limited (Ghorbel & Boujelbène, 2013). However Perry et al. (2012) argue by means of reviewing previous literature on effectuation that the state of conceptual effectuation literature as well as experimental and field study effectuation literature is predominantly in a nascent research state, with some articles rising to an intermediate research state. This indicates that not only the empirical literature, but also the theoretical literature on effectuation requires more body and proof in order to establish a firm established base of the concept of effectuation. Chandler et al. (2011) indicate that the five principles of effectuation as defined by Sarasvathy (2001a) might not be the appropriate set of distinct principles. They propose a set of three independent effectuation principles; experimentation, affordable loss, and flexibility. Also, Chandler et al. (2011) argue that pre-commitments as a dimension is shared by both causation and effectuation. This research at hand indicates that Dutch expert entrepreneurs do not use all effectuation principles as proposed by Sarasvathy (2001a), finding only significant proof for the effectual principles of means-based and partnerships & alliances. This might be due to cultural differences, which are not taken into account in this research.

Furthermore, Edmondson and McManus (2007) point out that data collection is vulnerable for finding spurious results when quantitative data analysis is conducted while there is little understanding from previous literature on the constructs being examined. They argue to use both quantitative and qualitative research methods to attain more convincing results. In this thesis, a qualitative research method (think aloud method) is combined with a quantitative research method (survey). The results of the qualitative method provided proof for some of the effectuation constructs, but the quantitative method provided no distinction in effectuation and causation. Cross-examining the qualitative method with the quantitative method was therefore impossible. This might suggest that more research is required on the survey, which is

based on Chandler et al. (2011), as to what the survey questions really evoke. Also, while the think aloud method is appropriate at small sample sizes, the survey benefits from a large sample size. Because of time constraints, from a total of 20 subjects, only 16 surveys were conducted. The sample size of this research is rather small for a quantitative method, making the generalizability low, which could explain the absence of significant distinctions in the survey results.

Another factor of consideration is the time between the thoughts occurring and formalizing the answer. With the think aloud method, these thoughts are verbalized and recorded when they enter the mind of the subject, minimizing the occurrence of a retrospection and introspection biases (Dew et al., 2009). The survey on the other hand provided the subject the time and opportunity to consider several answers before making a weighed decision, removing the immediacy and allowing for retrospection ad introspection biases. Further research might shed more light on the importance of immediacy in the application of effectuation.

# 6 Conclusion and recommendations

This final chapter provides the conclusion of the research at hand, based upon the results and the discussion of the results. Also, the practical and scientific relevance of the research at hand is presented, including directions for future research.

## 6.1 Hypotheses

By testing the five hypotheses, it is possible to provide and answer to the research question:
*"How do Dutch expert entrepreneurs apply the principles of causation and effectuation?"*

Overall, the Dutch expert entrepreneurs exhibit a significant difference skewed towards the use of effectuation, with 67% of the reasoning being effectual, thereby seemingly confirming the idea of effectuation. When zooming into the issues in which effectuation is distinguished from causation though, the null hypothesis is not rejected for all hypotheses. On the issues of contingencies (hypothesis 4) and future (hypothesis 5), the null hypothesis is retained. On the issues of action (hypothesis 1) and outsiders (hypothesis 3), the null hypothesis is rejected in favor of more focus on effectuation, while on the issue of risk (hypothesis 2), the null hypothesis is rejected in favor of more focus on causation.

The results of the think aloud method indicate that Dutch expert entrepreneurs are more effectual concerning action based behavior, showing more means-based reasoning than goal-driven reasoning, 84% versus 16%, and are more effectual concerning the stance towards outsiders, preferring the formation of partnerships & alliances (67%) instead of conducting thorough competitive analysis (33%). This focus on means-based decision-making is most apparent when it comes to challenges relating to leadership or vision, where means-based decision making is dominant, or hiring professional management, where both means-based decision making and a preference to the formation of partnerships & alliances are dominant. On the subject of risk though, Dutch expert entrepreneurs take a more causal stance, preferring a focus on expected returns (60%) instead of a focus on affordable loss (40%). When it comes to assessing contingencies, the Dutch expert entrepreneurs show a moderately equal reasoning in the causal method of assessing existing market knowledge and the effectual method of exploring contingencies. The same holds for viewing the future, where no significant division has been found between the causal method of trying to

predict the future and the effectual method of exerting non-predictive control of the future. These findings are not in line with the findings of Sarasvathy (2001a), even contrasting on the stance towards risk.

The survey results did not show significant differences in the application of causation and effectuation.

## 6.2 Scientific relevance

By researching the use of effectuation and causation among Dutch expert entrepreneurs, an important contribution to the academic body of knowledge is made, for previous research on the use of effectuation and causation by expert entrepreneurs has been limited to the United States. With the findings differentiating from the findings of Sarasvathy (2001a), more research is required on the generalizability of the principles of effectuation. This requirement is enhanced by Chandler et al. (2011), defining the state of research into effectuation as nascent towards intermediate, advocating for more research on both the theoretical as well as the empirical literature. With no proven distinction between causation and effectuation in the survey results, immediacy of the written or spoken verbalization of the thought might be of critical importance for the principles of effectuation. Also, the survey might require more investigation into what the questions evoke to assure that the answers truly align the intention of the question. Furthermore, the survey could be conducted on a larger sample, to check whether this yields the same results.

Future research on effectuation is also recommended to focus on means-based behavior and the formation of partnerships & alliances, for these effectual principles are predominantly used by Dutch expert entrepreneurs, with the main focus on means-based behavior, with a very high significance. Future research is also recommended to extend the body of knowledge on the role of effectuation in intrapreneurship, in order to investigate effectuation inside companies. This could include the further investigation into the role of means-based decision-making and the formation of partnerships & alliances on leadership, developing a company vision and on human resource management.

## 6.3 Practical relevance

For the current main-stream marketing textbooks still rely on a causational approach (Andersson, 2011), effectual reasoning is not a main topic in studies of business administration. The research at hand makes an important contribution, showing

effectuation to have a significant added value on entrepreneurial efforts. By introducing effectuation as a main course element in studies of business administration, graduates from these studies, including potential entrepreneurs, might have a better opportunity to really learn from the expert entrepreneurs and have a greater chance in succeeding in professional life. Based on the research at hand, the main focus of effectuation courses should lie on the principles of means-based and partnerships & alliances, which are proven to be used significantly by Dutch expert entrepreneurs.

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# Appendix A: Business Case (Dutch)

EPICC (Entrepreneurial Processes In a Cultural Context)

## De case

Introductie

In dit experiment gaat u tien beslissingsproblemen oplossen. Deze problemen komen voort uit de context van het opzetten van een nieuw bedrijf met een denkbeeldig product. Een meer gedetailleerde beschrijving van dit product volgt na deze introductie.

Voordat u zich in de productbeschrijving en de problemen gaat verdiepen vraag ik u om enige mate van creativiteit. Zie uzelf in de rol van de hoofdondernemer die het bedrijf opzet. U heeft erg weinig geld om het eigen bedrijf te starten, maar u heeft 5 jaar ervaring op het gebied van koffie verkoop.

Beschrijving

Sinds enige tijd heeft u lopen denken aan het starten van een eigen koffiecorner op uw universiteit. Uw inspiratie kwam voort uit het feit dat u als student op het moment dat u een verse bak koffie wilde hebben, dit niet mogelijk was. U hield niet van de automatenkoffie die aanwezig was in de gebouwen van de universiteit. U moest voor deze kwalitatief mindere koffie een bedrag betalen wat niet in relatie stond met wat u voor dat geld mocht verwachten. U weet wat er wel mogelijk zou kunnen zijn omdat u al 5 jaar ervaring heeft in het werken in een koffiecorner in het dorp waar u oorspronkelijk vandaan komt.

U zag dat er andere koffiecorners bestonden die erg succesvol waren, maar die waren vaak gerelateerd aan erg dure franchiseconcepten. Daarom heeft u bedacht dat het mogelijk moet zijn om een eigen koffiecorner te beginnen. U heeft in diverse media gezien dat er een groeiende vraag is naar koffie in uw thuisland.

U hebt alle mogelijke voorzorgsmaatregelen op het gebied van intellectueel eigendom geregeld. De naam van uw koffiecorner is Koffie B.V.

**Probleem 1: marktidentificatie**

Voordat we gaan kijken naar gegevens over de markt wil ik u vragen de volgende vragen 1 voor 1 te beantwoorden:

1. **Wie zouden potentiële klanten kunnen zijn voor uw koffiecorner?**
2. **Wie zouden uw potentiele concurrenten kunnen zijn?**
3. **Welke informatie zou u uit willen zoeken over uw klanten en concurrenten? Maak een lijstje van vragen die u in dit kader zou willen stellen.**
4. **Hoe zou u deze vragen beantwoord willen zien? Wat voor soort marktonderzoek zou u willen uitvoeren?**
5. **Wat denkt u dat de groeimogelijkheden zijn voor dit bedrijf?**

**Probleem 2: het beschrijven van de markt**

Bij dit probleem wordt u gevraagd een paar beslissingen te maken ten aanzien van de marketing.

Op basis van secundaire informatiebronnen (publiek toegankelijke marktrapporten etc.) schat u dat er 3 segmenten zijn die geïnteresseerd zouden kunnen zijn in uw koffiecorner;

| Segment | Geschatte totale omvang |
|---|---|
| Studenten | 40.000 |
| Medewerkers universiteit | 20.000 |
| Bezoekers (op jaarbasis) | 10.000 |

- Een schatting van koffie-verkoop op jaarbasis in uw thuisland komt uit op €448 miljoen.
- Een schatting van speciale koffie verkoop op jaarbasis is €100 miljoen.

In beide gevallen is er een verwachtte groei van minimaal 5% per jaar voor de aankomende 5 jaar.

De volgende resultaten volgen uit eerstehands (direct) marktonderzoek door uzelf.

Vragenlijst 1 – Een online vragenlijst, verstuurd per e-mail aan studenten, medewerkers en bezoekers (met toestemming) bevatte vragen gericht op het achterhalen van de mate van interesse voor de koffiecorner. Tevens werd gevraagd, op het moment dat aangegeven werd dat er interesse voor was, welke prijzen men bereid was te betalen voor een kop koffie.

In totaal vulden 500 van de 1000 mensen die gevraagd waren de enquête in.

Resultaten;

| Bereid te betalen(€) | Studenten (%) | Medewerkers (%) | Bezoekers (%) |
|---|---|---|---|
| 0,50 – 0,75 | 52 | 26 | 45 |
| 0,75 – 1,00 | 30 | 38 | 32 |
| 1,00 – 1,25 | 16 | 22 | 15 |
| 1.25 – 1,75 | 2 | 9 | 8 |
| 1,75 – 2,50 | 0 | 5 | 0 |
| Totaal | 100 | 100 | 100 |

Vragenlijst 2 – Papieren vragenlijsten, uitgedeeld gedurende lunchpauzes.

| Bereid te betalen(€) | Studenten (%) | Medewerkers (%) | Bezoekers (%) |
|---|---|---|---|
| 0,50 – 0,75 | 65 | 21 | 51 |
| 0,75 – 1,00 | 25 | 49 | 42 |
| 1,00 – 1,25 | 10 | 19 | 7 |
| 1.25 – 1,75 | 0 | 8 | 0 |
| 1,75 – 2,50 | 0 | 3 | 0 |
| Totaal | 100 | 100 | 100 |

Vragenlijst 3 – Een focusgroep van medewerkers, anders dan diegenen die meededen aan de online en papieren vragenlijst werd gevraagd mee te doen met het onderzoek.

De medewerkers van de universiteit die mee hebben gedaan met het focusgroep-onderzoek vonden het plan van de koffiecorner erg interessant. Zij gaven echter aan dat het scala aan koffies wellicht moest worden uitgebreid en dat ze in dat geval bereid waren €1,50 of meer te betalen. Met het huidige aanbod zouden ze €1,00 - €1,25 uit willen geven, maar dan werd er wel verwacht dat er een bonussysteem ingevoerd zou worden waarbij consumenten konden sparen voor kortingen na een x-aantal koppen koffie te hebben gekocht.

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Zowel bij het onderzoek tijdens de lunch als bij de focusgroep waren de reacties ten aanzien van de koffiecorner erg positief en enthousiast. Beide partijen gaven goede feedback op specifieke componenten om tot verbeteringen te komen. De medewerkers zijn in het bijzonder geïnteresseerd in het uitbreiden van het aanbod bovenop de reguliere koffies. Ze geven aan dat er meer diversiteit nodig was als men het product bij hen aan de man wilde brengen. Ze gaven daarnaast ook aan dat er bedrijven waren die wellicht reclame op mokken konden plaatsen waarvoor dan korting kon worden bedongen.

Marketing

Op basis van alle marktonderzoek dat u uitgevoerd heeft komt u tot de volgende kosten om uw product verder in de markt te zetten en naamsbekendheid te geven;

| | |
|---|---|
| Internet | €200 meteen te voldoen + €25 per maand daarna |
| Kranten | Relatief goedkoop – maar kosten voor deze reclames kunnen oplopen tot €500 per stuk |
| Bioscoop | €2000 tot 4000 per maand, en €1000 voorafgaand te betalen |
| Reclame op de lokale TV | €5000 tot 10.000 voorafgaand te betalen |

Bij directe reclame elders (denk aan kantines, het uitdelen van aanstekers met de naam van de koffie corner, etc.) betekent dat u verkopers moet trainen.

Concurrenten

Geen van de vier onderstaande potentiele concurrenten verkoopt goedkope kwaliteitskoffie op uw universiteit danwel in het centrum van de stad. U bent uniek ten aanzien van dat concept.

| **Bedrijf** | **Algemeen prijsniveau per kop koffie** | **Omzet** | **Waar?** |
|---|---|---|---|
| Starbucks | € 3,00 | €6.5 miljard | Grote steden / wereldwijd |
| Kaldi | € 2,00 | €225 miljoen | Grote steden / Europa |
| Simon Levelt | € 2,50 | €130 miljoen | Grote steden / Europa |
| Douwe Egberts winkel | € 2,00 | €25 miljoen | Grote steden/ **Nederland** |

Deze bedrijven hebben een netto opbrengst van 25% op hun verkopen.

In dit stadium wordt u gevraagd om de volgende beslissingen te maken (denk er daarbij aan om hardop te blijven praten);

1. **Aan welk marktsegment / segmenten wilt u uw product gaan verkopen?**
2. **Welke prijs wilt u op het product plakken?**
3. **Hoe wilt u aan het door uw gekozen segment / segmenten gaan verkopen?**

**Probleem 3: Salaris**

U bent het bedrijf begonnen met erg weinig geld. De voornaamste manier van adverteren is 'face-to-face' promotie. U bent zes maanden bezig met marketing-activiteiten om uw product in de markt te zetten. U heeft de prijzen van uw product gezet op het laagste segment (zoals aangegeven in de vragenlijst); 0.50 – 0.75 euro. U heeft gemiddeld 3000 klanten per maand. Op basis van diverse suggesties die u van klanten heeft gekregen denkt u dat u ook speciale koffies zou kunnen gaan verkopen in het prijssegment 1.25 – 1.50 euro. Dit zou voornamelijk kunnen als u het interieur van de koffiecorner zou herontwerpen waarbij u het meer 'cachet' zou kunnen geven.

U heeft uw laatste spaargeld ingezet en uw limiet van uw creditcards gebruikt om er voor te zorgen dat u voldoende koffies op voorraad heeft. U heeft dat ook nodig om mee te doen aan een wedstrijd waar 'architectuur ontmoet catering' het thema is. Deze wedstrijd zal zorgen voor veel publiciteit.

U heeft vier medewerkers – en u heeft geen geld meer om de komende salarisuitbetaling voor elkaar te krijgen. U schat in dat u 30,000 euro nodig heeft om de eerstkomende drie maanden te overleven en om een super cool concept voor een nieuwe koffiecorner te bedenken op basis waarvan u mee kan doen met de wedstrijd.

**U heeft vier opties;**

1. **Lenen van de ouders van uw vriend(in) – zij zijn niet erg rijk, maar kunnen waarschijnlijk wel 30,000 euro regelen als het nodig zou moeten zijn.**
2. **Lenen van oude vrienden die u kent van de universiteit en van uw oude bijbaan.**
3. **Uw ouders overtuigen van het feit dat ze een extra hypotheek op hun woning nemen.**
4. **Uw medewerkers overtuigen dat ze over 3 maanden uitbetaald zullen worden.**

**Welke van deze opties kiest u? Waarom?**

**Probleem 4: financiering**

Uw nieuwe concept van de koffiecorner heeft de eerste prijs gewonnen bij de wedstrijd 'architectuur ontmoet catering' in de categorie 'beste nieuwkomer'. Dit heeft er toe geleid dat grote koffie-leveranciers zoals Nestlé Netherlands B.V. gevraagd hebben naar mogelijkheden om het concept verder op de markt te zetten. Dit zou veel media attentie krijgen. U schat in dat het verder ontwikkelen van dit concept zo'n zes maanden zou moeten gaan duren en vervolgens drie maanden om het via drie grote kanalen bekendheid te geven – Internet, landelijke kranten en landelijke tv. De koffie zal worden geprijsd op €1,90 per kop. Dit is de prijs in de nieuwe koffiecorner. U schat dat u €150.000 nodig heeft om quitte te draaien (ten tijde van het derde kwartaal van het tweede jaar). Hierbij zitten de kosten inbegrepen voor verbetering van het nieuwe concept, het aanstellen van excellente (ondersteunende) medewerkers, het trainen van de verkopers en een enorm grote advertentie campagne via internet, kranten en tv.

U schat in dat de verkoopcijfers voor de aankomende vijf jaar als volgt zullen zijn (u bent aan het begin van het eerste jaar);

| | Jaar 1 | Jaar 2 | Jaar 3 | Jaar 4 | Jaar 5 |
|---|---|---|---|---|---|
| Verkopen | € 100.000 | € 150.000 | € 300.000 | €500.000 | €1 M |
| Winst | € < 0 | € 20.000 | €40.000 | €200.000 | €300.000 |

U heeft drie financieringsopties;

Optie 1; een durf-investeerder met een focus op startende ondernemingen in de catering en aanpalende terreinen is bereid de €150.000 te financieren voor een belang van 48% van de aandelen

Optie 2; een vriend van de familie die veel ervaring heeft in de catering industrie is erg gretig om een vennootschap aan te gaan met u – voor een belang van 33% in het bedrijf. Hij heeft €150.000 beschikbaar maar wil wel een basis salaris van €40.000 per jaar. Hij gaat akkoord met een basissalaris van €30.000 euro per jaar voor de eerste twee jaar. U kunt goed overweg met deze man, u respecteert hem en u heeft geen negatieve gevoelens jegens hem.

Optie 3; u kunt doorgaan met het bedrijf op basis van de huidige financiering – resulterend in een significant langzamere groei.

**Welke optie kiest u? En waarom?**

**Als de durf-investeerder ook akkoord gaat met een aandeel van 33%, welke optie zou u dan kiezen?**

**Probleem 5: leiderschap en visie**

U heeft de financiering gevonden en u heeft een contract getekend met twee grote koffieleveranciers om uw koffiecorner te promoten. U heeft nieuw personeel aangetrokken en bent in een nieuw bedrijfspand gaan zitten. Een lokale krant is bezig met een serie over lokale ondernemers en wil een artikel over u schrijven. U beseft zich dat dit artikel een cruciaal moment zou kunnen zijn in de ontwikkeling van uw bedrijf en u ziet dit als een mogelijkheid om de wereld (en uw nieuwe personeel) te laten zien wat uw toekomstige ideeën zijn.

De serie artikelen is erg succesvol en wordt routinematig opgepikt door landelijke kranten. Een van de succesfactoren is de krantenkop, bestaande uit een slogan waarin de visie van de ondernemer ten aanzien van waar het bedrijf in 2013 zou moeten staan, tot uiting komt.

Er zijn een aantal mogelijkheden voor deze slogan;

1. Starbucks is het verleden – Koffie B.V. is de toekomst.
2. We azen erop minstens duizend medewerkers te hebben in 2015.
3. De snelst groeiende koffie cateraar.
4. Investeer in Koffie B.V. – geniet van Nederlandse traditie.

**Welk van bovenstaande slogans kiest u? Waarom? Als u niet kan kiezen uit bovenstaande slogans en u heeft uw eigen ideeën voor een alternatief, wees vrij om dat te doen.**

**Probleem 6: herontwerpen, deel 1**

U bent bijna aan het eind van uw vijfde jaar en u bent er maar net in geslaagd om quitte te draaien (veel later dan verwacht). U heeft uw deuren geopend naar alle drie klant segmenten (studenten, medewerkers en bezoekers). Verkopen, alhoewel stabiel en continu zijn behoorlijk vlak. U begint te twijfelen hoe u uw doelen om te groeien kunt behalen. U besluit een serieus marktonderzoek uit te voeren om uit te vinden hoe u de verkoop omhoog zou kunnen brengen. U organiseert een bijeenkomst met een focusgroep waarbij potentiele en bestaande klanten zijn opgenomen. Het grote probleem blijkt de grote 'split' te zijn tussen reguliere koffie en meer gespecialiseerde producten.

Meer dan 90% van de deelnemers in de focusgroep vinden het reguliere product interessant. Maar als speciale koffies worden bekeken blijkt er een groot verschil in opinie te zijn. De deelnemers die in eerste instantie meer gebruik maken van reguliere koffie blijken bijna nooit gespecialiseerde koffies te kopen en vragen zich openlijk af waarom dat 'elite spul' er überhaupt is. Diegenen die meer geïnteresseerd zijn in de speciale koffies richten zich eigenlijk helemaal niet op reguliere koffies en vinden dat deze reguliere koffies de sfeer naar beneden haalt.

**Hoe reageert u op deze feedback?**

**Probleem 6: herontwerpen deel 2**

U gaat terug naar het begin en denkt na over een concept waarbij u voor beide partijen een oplossing zou kunnen vinden. U vindt deze in een concept met de huidige reguliere koffiecorner samen met een nieuwe winkel. Het huidige concept zal meer gericht zijn op de meer reguliere koffies. De nieuwe winkel zal gericht zijn op meer exclusieve koffies en thee. Bij de meer exclusieve koffie kunt u denken aan Aziatische, Latijns-Amerikaanse en Afrikaanse koffiesoorten. In totaal zouden dat 20 verschillende soorten zijn. De thee is verkrijgbaar in 15 verschillende soorten.

Daarnaast zijn in de nieuwe winkel een breed scala aan gebakjes en exclusieve cupcakes verkrijgbaar. Vervolgens zijn er ook mogelijkheden boeken te lenen, kranten te lezen en hebben klanten toegang tot gratis draadloos internet.

U bent van plan om in de reguliere koffiecorner 5 types reguliere koffie te verkopen. Te denk valt aan cappuccino, espresso, etc., en daarnaast 5 reguliere theesoorten, zoals China Blossom en Rooibos. Verder een beperkt aanbod aan donuts en muffins.

U start met het uitwerken van het idee van de meer exclusieve winkel door 15 verschillende koffies en 10 theesoorten aan te bieden, met een iets beperkter aanbod in de gebakjes & cupcakes dan uiteindelijk de bedoeling is. Samen met gratis kranten en gratis draadloos internet is dat wat u aan de focusgroep laat zien. Het blijkt dat de exclusieve winkel met veel enthousiasme wordt ontvangen en mensen zijn bereid 2 tot 2,5 keer zoveel te betalen als wat eerder werd gevraagd.

Een van de vereisten echter is dat u de uitbreiding moet maken die u in gedachten had (15 soorten thee, 20 soorten koffie, de boeken, de kranten en gratis draadloos internet). U moet besluiten of u deze grote verandering in het concept daadwerkelijk wilt doorvoeren of dat u zich gaat richten op 1 van de 2 concepten. Als u wilt uitbreiden dan zijn de kosten minimaal €200.000 met daarnaast nog een aparte marketing-campagne.

| Jaar | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Verwachte verkoop (€M) | 0.10 | 0.50 | 1 | 6 | 12 | 18 | 24 | 30 |
| Daadwerkelijke verkoop (€M) | 0.14 | 0.48 | 0.84 | 2.8 | 4.2 | | | |

**Welke van de 2 alternatieven (focus op 1 van de 2 doelgroepen, danwel beide doelgroepen bedienen) kiest u? En waarom?**

*Voor vervolg van de vraag, zie volgende pagina*

Als we aannemen dat u gekozen heeft voor het concept van de uitbreiding (beide doelgroepen bedienen), dan dient u nu uit de volgende 3 opties te kiezen;

1. U laat het herontwerp binnen het eigen bedrijf uitvoeren; verwachte kosten; €250.000
2. U laat het ontwerp over aan een ander bedrijf in uw thuisland; verwachte kosten €200.000
3. U laat het ontwerp over aan een ander bedrijf in het buitenland; verwachte kosten €100.000

**Welke optie kiest u? En waarom?**

**Probleem 7: Groei van het bedrijf, deel 1**

U bent bijna aan het eind van het zesde jaar. U heeft nu 2 typen bedrijven ondergebracht onder Koffie B.V.

1. Gewoon Koffie (verkoop tussen de €1,00 en €5,00 pp) waar u een beperkt aantal 'standaard' soorten koffie en thee verkoopt met daarbij een beperkt aantal donuts, cupcakes en chocolade.
2. Exquise (verkoop tussen de €5,00 en 10,00 pp) waar u het 'complete scala' aanbiedt.

Het aantal verkooppunten en daarmee het aantal nieuwe managers is op 20 uitgekomen, daar waar het er origineel 3 waren. U bent nog steeds bezig om het aantal verkopers uit te breiden en daarnaast ontwikkelt u een nog betere versie van Exquise om de rijkere buurten in uw stad te kunnen bedienen. Jan van Zomeren, een prima verkoper (voorheen actief in de verkoop van de reguliere koffie) die het verkoopteam vanaf de eerste dag geleid heeft, is niet in staat gebleken zich aan te passen aan de nieuwe ontwikkelingen. Hij is duidelijk niet de persoon om de nieuwe Exquise winkels te leiden. **Hoe gaat u om met deze situatie?**

| Jaar | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Herziene versie | | |
| Verwachte verkopen (€M) | 0.10 | 0.50 | 1 | 6 | 12 | 6 | 12 | 20 |
| Daadwerkelijke verkoop (€M) | 0.14 | 0.48 | 0.84 | 2.8 | 4.2 | 8.6 | | |

**Zou u hem;**

1. **Ontslaan?**
2. **Een nieuwe manager boven hem aanstellen om het verkoopteam te leiden? Zo ja, zou u voordat u dat doet met Jan overleggen? Hoe zou u dit nieuws aan hem brengen?**

**Voel u vrij om uit te weiden over hoe u met deze situatie om zou gaan.**

**Probleem 7: groei van het bedrijf, deel 2**

Alhoewel uw bedrijf al enige tijd aan het groeien is, probeert u toch de 'ondernemerschapscultuur' binnen het bedrijf levend te houden. U begint echter te merken dat uw partner meer en meer het idee uitbeeldt van een meer "zakelijke ambiance" – lange vergaderingen, ingewikkelde organisatietabellen, dure accountants, consultants om "het marktpotentieel te optimaliseren", enzovoort. Als u daarover met hem in gesprek raakt dan merkt u dat hij denkt dat de tijd aangebroken is voor een meer zakelijke aanpak. Deze meer professionele aanpak zou zelfs goed zijn voor het bedrijf an sich.

| Jaar | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Herziene versie | | |
| Verwachte verkoop (€M) | 0.10 | 0.50 | 1 | 6 | 12 | 6 | 12 | 20 |
| Daadwerkelijke verkoop (€M) | 0.14 | 0.48 | 0.84 | 2.8 | 4.2 | 8.6 | 20 | 27.5 |

**Hoe zou u met deze situatie omgaan? Denkt u dat het tijd wordt voor Koffie b.v. om meer 'zakelijk' te gaan?**

**Probleem 8: aanstellen professioneel management**

U bent aangeland in het 8e jaar. Het gaat uitstekend. De groeicijfers zijn beter dan de oorspronkelijke doelen en het marktaandeel wordt groter. Uw verkopen zijn €27,5 miljoen en u voorziet een groei van 25% per jaar voor de aankomende 3 jaar.

| Jaar | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Herziene versie | | |
| Verwachte verkoop (€M) | 0.10 | 0.50 | 1 | 6 | 12 | 6 | 12 | 20 |
| Daadwerkelijke verkoop (€M) | 0.14 | 0.48 | 0.84 | 2.8 | 4.2 | 8.6 | 20 | 27.5 |

Het advies van de Raad van Bestuur van Koffie B.V. is om professioneel management aan te stellen om het bedrijf te runnen opdat u zich kunt richten op de groei en het bedenken van nieuwe strategische initiatieven. Gesteld dat u al een drietal 'high potentials' voor ogen heeft uit te nodigen voor een interview voor de positie van ' Chief Operating Officer' (COO), **hoe zou u dit interview voorbereiden?**

**Geeft u aub de type vragen die u zou stellen, de interviewtechnieken die u zou gebruiken en kritische onderwerpen die u aan de orde zou stellen tijdens het interview.**

**Probleem 9: goodwill**

U wordt gevraagd bij het hoofd van een school in de binnenstad die samenwerkt met 10 andere scholen zoals de hare. Zij geeft aan dat zij denkt dat Exquise een perfecte leeromgeving zou kunnen zijn voor haar studenten binnen de opleiding 'Catering'.

Zij vraagt of u samen met een aantal zeer enthousiaste onderwijzers een basis lespakket zou willen ontwikkelen voor de studenten zodat ze in Exquise zouden kunnen werken. Dit project betekent niet alleen een investering van €100.000 voor aanpassingen binnen uw bedrijf, maar ook een redelijke portie van uw tijd gedurende een periode van 6 maanden en daarnaast wordt uw aanwezigheid gevraagd bij minstens 10 colleges per jaar voor minimaal enkele jaren.

N.B.; uw verkopen zijn op een niveau van 27,5 miljoen euro per jaar en u voorziet een groeipercentage van 25% voor de aankomende 3 jaar.

**Neemt u het initiatief voor dit project?**

**Zo niet, waarom niet?**

**Indien 'ja', zou u dan:**

1. **Het project doneren?**
2. **Het voor de kostprijs verkopen? (€100.000)**
3. **Het voor een gangbare marktwaarde verkopen?**

**Waarom?**

**Probleem 10: exit**

U bent nu in het 10e jaar aangeland. Exquise is een groot succes en mede dank zij uw nieuwe doelgroepen strategie groeit Gewoon koffie ook naar behoren. U heeft 3 andere catering concepten opgekocht en u maakt een omzet van €38 miljoen. U schat in dat u binnen 1 jaar €70 miljoen omzet zal maken.

Op dit moment zijn er **2 mogelijke richtingen**;

**Richting 1**;

Uw accountants en andere financiële experts denken dat het een goed moment is om het bedrijf naar de beurs te leiden. De IPO aandelenmarkt (nieuwe aandelen) is in opkomst en catering past daar prima binnen. Zij schatten dat de eerste prijszetting van 2 miljoen aandelen op €30 per aandeel zal worden gezet. In totaal heeft het bedrijf 12 miljoen aandelen.

**Richting 2**;

Starbucks komt naar uw kantoor en doet een bod op uw bedrijf. Het blijkt dat ze besloten hebben om zich meer in het luxere segment te gaan begeven en ze hebben besloten dit te doen door het opkopen van andere bedrijven. Ze zien uw bedrijf als een prima optie voor deze strategie en ze bieden u €300 miljoen.

| Jaar | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Herzien concept | | | | |
| Verwachte verkoop (€M) | 0.10 | 0.50 | 1 | 6 | 12 | 6 | 12 | 20 | 30 | 45 |
| Daadwerkelijke verkoop (€M) | 0.14 | 0.48 | 0.84 | 2.8 | 4.2 | 8.6 | 20 | 27.5 | 38 | 70 |

**Welke van bovenstaande 2 richtingen kiest u? En waarom?**

Dank u voor uw medewerking; u krijgt nu nog een beperkt aantal vragen n.a.v. deze case

# Appendix B: Questionnaires

## Questionnaire – Biographic information

Name of Interviewer:

Name of Interviewee:

Email for future contact:

Number of interview:

(Former) Student of _____ (discipline, eg. Business administration),

Level _____ (Bachelor, Master, PhD; other)

_____ (Name of University) in

_____ (City)

_____ (Name of Country)

Years of university education: _____ (years)

Years of working experience: _____ (years)

Years of working experience with entrepreneurship/leadership component OUTSIDE own company _____ years)

Date of birth: _____

Sex: _____ male / female

Place of birth: _____ (city, country)

Religion: _____

Marital status: single / living together / married

Children: yes / no

International experience _____ years

As _____ (student/ worked / raised as a kid / …… other)

In _____ (country)

Family background: at least one parent employed in private company / employed as public servant / entrepreneur

Parents income (in rel. to county average): lower quartile / middle half / upper quartile

# Questionnaire – Survey about own company of entrepreneur

Interviewer Name:

Interviewee Name:

Code number interview: (same as for the biographical info)

Email interviewee: _____

Name / website of company: _____

Short description of company (what business are you in):
_____
_____
_____
_____
_____

Founding date: _____

Founding place: _____

Number of founders (including entrepreneur): _____

Current number of employees (including all founders, in full time equivalents): _____

Annual turnover in country currency: _____ (amount) _____ currency

To what degree did you start your enterprise because you had no other option for work?

| Not at all | A little | Somewhat | To a large extent | absolutely |
|---|---|---|---|---|
| | | | | |

To what degree did you start your enterprise because you wanted to become independent or increase your income

| Not at all | A little | Somewhat | To a large extent | absolutely |
|---|---|---|---|---|
| | | | | |

(Measures for necessity vs. opportunity taken from GEM)

Please answer this questionnaire on the basis of reflecting on your own company.

Please have a look at the following statements. Now, circle 1 answer out of 5, in which you indicate you to degree to which you do not agree or agree to the statement.

| | Do not agree | Agree little | Agree somewhat | Mostly agree | Fully agree |
|---|---|---|---|---|---|
| 1. We analyzed long run opportunities and selected what we thought would provide the best returns | | | | | |
| 2. We developed a strategy to best take advantage of resources and capabilities | | | | | |
| 3. We researched and selected target markets and did meaningful competitive analysis | | | | | |
| 4. We designed and planned business strategies | | | | | |
| 5. We organized and implemented control processes to make sure we met objectives | | | | | |
| 6. We had a clear and consistent vision for what we wanted to do | | | | | |
| 7. We designed and planned production and marketing efforts | | | | | |
| 8. Our decision making has been largely driven by expected returns | | | | | |
| 9. It was impossible to see from the beginning where we wanted to end | | | | | |
| 10. We experimented with different products and / or business models | | | | | |
| 11. The product/service we now provide is essentially the same as originally conceptualized | | | | | |
| 12. The ultimate product/service we now provide is substantially different from than we first imagined | | | | | |
| 13. We tried a number of different approaches until we found a business model that worked | | | | | |
| 14. We were careful not to commit more resources than we could afford to lose | | | | | |
| 15. We were careful not to commit more money than we were willing to lose with our initial business idea | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Do not agree | Agree little | Agree somewhat | Mostly agree | Fully agree |
| 16. We have allowed the business to evolve as opportunities have emerged | | | | | |
| 17. We adapted what we were doing to the resources we had | | | | | |
| 18. We were flexible and took advantage of opportunities as they arose. | | | | | |
| 19. We avoided courses of action that restricted our flexibility and adaptability. | | | | | |
| 20. We evaluated the set of resources and means we had at our disposal and thought about different options | | | | | |
| 21. We started out very flexibly and tried to take advantage of unexpected opportunities as they arose | | | | | |
| 22. We used a substantial number of agreements with customers, suppliers and other organizations and people to reduce the amount of uncertainty | | | | | |
| 23. We used pre-commitments from customers and suppliers as often as possible | | | | | |
| 24. We tried to get resource commitments and sales commitments as early as possible | | | | | |

Note 1: Scales from Chandler et al. (2011): Causation and effectuation processes: a validation study. JBV, 26(3), 375-390, Table one / Table 2 (last item us)

Note 2: When you have used the previous questionnaire, you need to recode (make sure the items show in the right direction), and go back to the entrepreneur to ask the missing questions.

# Appendix C: One-sample T-tests (detailed)

**One-Sample Statistics**

| | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| Share of Goal-driven (%) (causation) | 20 | ,1573 | ,06459 | ,01444 |
| Share of Means-based (%) (effectuation) | 20 | ,8427 | ,06459 | ,01444 |
| Share of Expected returns (%) (causation) | 20 | ,6015 | ,21646 | ,04840 |
| Share of Affordable loss (%) (effectuation) | 20 | ,3985 | ,21646 | ,04840 |
| Share of Competitve analysis (%) (causation) | 20 | ,3336 | ,17896 | ,04002 |
| Share of Partnerships & alliances (%) (effectuation) | 20 | ,6664 | ,17896 | ,04002 |
| Share of Existing market knowledge (%) (causation) | 20 | ,5213 | ,32092 | ,07176 |
| Share of Exploring contingencies (%) (effectuation) | 20 | ,4787 | ,32092 | ,07176 |
| Share of Predicition of the future (%) (causation) | 20 | ,4312 | ,22575 | ,05048 |
| Share of Non predictive control (%) (effectuation) | 20 | ,5688 | ,22575 | ,05048 |

One-Sample T-test statistics for overall shares

**One-Sample Test**

| | Test Value = 0.5 | | | | | |
|---|---|---|---|---|---|---|
| | t | df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| | | | | | Lower | Upper |
| Share of Goal-driven (%) (causation) | -23,728 | 19 | ,000 | -,34268 | -,3729 | -,3125 |
| Share of Means-based (%) (effectuation) | 23,728 | 19 | ,000 | ,34268 | ,3125 | ,3729 |
| Share of Expected returns (%) (causation) | 2,097 | 19 | ,050 | ,10152 | ,0002 | ,2028 |
| Share of Affordable loss (%) (effectuation) | -2,097 | 19 | ,050 | -,10152 | -,2028 | -,0002 |
| Share of Competitve analysis (%) (causation) | -4,158 | 19 | ,001 | -,16639 | -,2502 | -,0826 |
| Share of Partnerships & alliances (%) (effectuation) | 4,158 | 19 | ,001 | ,16639 | ,0826 | ,2502 |
| Share of Existing market knowledge (%) (causation) | ,297 | 19 | ,770 | ,02133 | -,1289 | ,1715 |
| Share of Exploring contingencies (%) (effectuation) | -,297 | 19 | ,770 | -,02133 | -,1715 | ,1289 |
| Share of Predicition of the future (%) (causation) | -1,363 | 19 | ,189 | -,06880 | -,1745 | ,0369 |
| Share of Non predictive control (%) (effectuation) | 1,363 | 19 | ,189 | ,06880 | -,0369 | ,1745 |

One-Sample T-test for overall shares

**One-Sample Statistics per case problem**

| | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| Share causation (%) in P1 | 20 | ,5565 | ,16906 | ,03780 |
| Share effectuation (%) in P1 | 20 | ,4435 | ,16906 | ,03780 |
| Share causation (%) in P2 | 20 | ,3822 | ,12234 | ,02736 |
| Share effectuation (%) in P2 | 20 | ,6178 | ,12234 | ,02736 |
| Share causation (%) in P3 | 20 | ,2679 | ,29310 | ,06554 |
| Share effectuation (%) in P3 | 20 | ,7321 | ,29310 | ,06554 |
| Share causation (%) in P4 | 20 | ,3776 | ,21189 | ,04738 |
| Share effectuation (%) in P4 | 20 | ,6224 | ,21189 | ,04738 |
| Share causation (%) in P5 | 20 | ,1071 | ,17717 | ,03962 |
| Share effectuation (%) in P5 | 20 | ,8929 | ,17717 | ,03962 |
| Share causation (%) in P6 | 20 | ,3042 | ,17651 | ,03947 |
| Share effectuation (%) in P6 | 20 | ,6958 | ,17651 | ,03947 |
| Share causation (%) in P7 | 20 | ,2822 | ,19573 | ,04377 |
| Share effectuation (%) in P7 | 20 | ,7178 | ,19573 | ,04377 |
| Share causation (%) in P8 | 20 | ,1313 | ,17078 | ,03819 |
| Share effectuation (%) in P8 | 20 | ,8687 | ,17078 | ,03819 |
| Share causation (%) in P9 | 20 | ,2239 | ,20753 | ,04641 |
| Share effectuation (%) in P9 | 20 | ,7761 | ,20753 | ,04641 |
| Share causation (%) in P10 | 20 | ,4233 | ,29619 | ,06623 |
| Share effectuation (%) in P10 | 20 | ,5767 | ,29619 | ,06623 |

One-Sample T-test statistics per Case Problem

**One-Sample Test per case problem**

| | Test Value = 0.5 | | | | | |
|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | |
| | t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| Share causation (%) in P1 | 1,496 | 19 | ,151 | ,05654 | -,0226 | ,1357 |
| Share effectuation (%) in P1 | -1,496 | 19 | ,151 | -,05654 | -,1357 | ,0226 |
| Share causation (%) in P2 | -4,308 | 19 | ,000 | -,11784 | -,1751 | -,0606 |
| Share effectuation (%) in P2 | 4,308 | 19 | ,000 | ,11784 | ,0606 | ,1751 |
| Share causation (%) in P3 | -3,541 | 19 | ,002 | -,23208 | -,3693 | -,0949 |
| Share effectuation (%) in P3 | 3,541 | 19 | ,002 | ,23208 | ,0949 | ,3693 |
| Share causation (%) in P4 | -2,583 | 19 | ,018 | -,12236 | -,2215 | -,0232 |
| Share effectuation (%) in P4 | 2,583 | 19 | ,018 | ,12236 | ,0232 | ,2215 |
| Share causation (%) in P5 | -9,917 | 19 | ,000 | -,39286 | -,4758 | -,3099 |
| Share effectuation (%) in P5 | 9,917 | 19 | ,000 | ,39286 | ,3099 | ,4758 |
| Share causation (%) in P6 | -4,960 | 19 | ,000 | -,19578 | -,2784 | -,1132 |
| Share effectuation (%) in P6 | 4,960 | 19 | ,000 | ,19578 | ,1132 | ,2784 |
| Share causation (%) in P7 | -4,975 | 19 | ,000 | -,21776 | -,3094 | -,1262 |
| Share effectuation (%) in P7 | 4,975 | 19 | ,000 | ,21776 | ,1262 | ,3094 |
| Share causation (%) in P8 | -9,655 | 19 | ,000 | -,36869 | -,4486 | -,2888 |
| Share effectuation (%) in P8 | 9,655 | 19 | ,000 | ,36869 | ,2888 | ,4486 |
| Share causation (%) in P9 | -5,949 | 19 | ,000 | -,27607 | -,3732 | -,1789 |
| Share effectuation (%) in P9 | 5,949 | 19 | ,000 | ,27607 | ,1789 | ,3732 |
| Share causation (%) in P10 | -1,158 | 19 | ,261 | -,07667 | -,2153 | ,0620 |
| Share effectuation (%) in P10 | 1,158 | 19 | ,261 | ,07667 | -,0620 | ,2153 |

One-Sample T-test per Case Problem

**One-Sample Statistics for case problem 8 (Leadership/Vision)**

| | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| Share of Goal-driven (%) (causation) | 20 | ,0250 | ,11180 | ,02500 |
| Share of Means-based (%) (effectuation) | 20 | ,9750 | ,11180 | ,02500 |
| Share of Expected returns (%) (causation) | 20 | ,1000 | ,30779 | ,06882 |
| Share of Affordable loss (%) (effectuation) | 20 | ,0000 | ,00000[a] | ,00000 |
| Share of Competitive analysis (%) (causation) | 20 | ,2000 | ,41039 | ,09177 |
| Share of Partnerships & alliances (%) (effectuation) | 20 | ,0500 | ,22361 | ,05000 |
| Share of Existing market knowledge (%) (causation) | 20 | ,0000 | ,00000[a] | ,00000 |
| Share of Exploring contingencies (%) (effectuation) | 20 | ,1000 | ,30779 | ,06882 |
| Share of Prediction of the future (%) (causation) | 20 | ,0250 | ,11180 | ,02500 |
| Share of Non predictive control (%) (effectuation) | 20 | ,2750 | ,44352 | ,09917 |

a. t cannot be computed because the standard deviation is 0.

One-Sample T-test statistics for Case Problem 5

**One-Sample Test for case problem 8 (Leadership/Vision)**

| | Test Value = 0.5 | | | | | |
|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | |
| | t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| Share of Goal-driven (%) (causation) | -19,000 | 19 | ,000 | -,47500 | -,5273 | -,4227 |
| Share of Means-based (%) (effectuation) | 19,000 | 19 | ,000 | ,47500 | ,4227 | ,5273 |
| Share of Expected returns (%) (causation) | -5,812 | 19 | ,000 | -,40000 | -,5441 | -,2559 |
| Share of Competitive analysis (%) (causation) | -3,269 | 19 | ,004 | -,30000 | -,4921 | -,1079 |
| Share of Partnerships & alliances (%) (effectuation) | -9,000 | 19 | ,000 | -,45000 | -,5547 | -,3453 |
| Share of Exploring contingencies (%) (effectuation) | -5,812 | 19 | ,000 | -,40000 | -,5441 | -,2559 |
| Share of Prediction of the future (%) (causation) | -19,000 | 19 | ,000 | -,47500 | -,5273 | -,4227 |
| Share of Non predictive control (%) (effectuation) | -2,269 | 19 | ,035 | -,22500 | -,4326 | -,0174 |

One-Sample T-test for Case Problem 5

**One-Sample Statistics for case problem 8 (Hiring Professional Management)**

| | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| Share of Goal-driven (%) (causation) | 20 | ,1393 | ,25925 | ,05797 |
| Share of Means-based (%) (effectuation) | 20 | ,8607 | ,25925 | ,05797 |
| Share of Expected returns (%) (causation) | 20 | ,1000 | ,30779 | ,06882 |
| Share of Affordable loss (%) (effectuation) | 20 | ,0500 | ,22361 | ,05000 |
| Share of Competitive analysis (%) (causation) | 20 | ,0000 | ,00000[a] | ,00000 |
| Share of Partnerships & alliances (%) (effectuation) | 20 | ,8500 | ,36635 | ,08192 |
| Share of Existing market knowledge (%) (causation) | 20 | ,1500 | ,36635 | ,08192 |
| Share of Exploring contingencies (%) (effectuation) | 20 | ,2500 | ,44426 | ,09934 |
| Share of Prediction of the future (%) (causation) | 20 | ,0000 | ,00000[a] | ,00000 |
| Share of Non predictive control (%) (effectuation) | 20 | ,0500 | ,22361 | ,05000 |

a. t cannot be computed because the standard deviation is 0.

One-Sample T-test statistics for Case Problem 8

**One-Sample Test for case problem 8 (Hiring Professional Management)**

| | Test Value = 0.5 | | | | | |
|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | |
| | t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| Share of Goal-driven (%) (causation) | -6,223 | 19 | ,000 | -,36071 | -,4820 | -,2394 |
| Share of Means-based (%) (effectuation) | 6,223 | 19 | ,000 | ,36071 | ,2394 | ,4820 |
| Share of Expected returns (%) (causation) | -5,812 | 19 | ,000 | -,40000 | -,5441 | -,2559 |
| Share of Affordable loss (%) (effectuation) | -9,000 | 19 | ,000 | -,45000 | -,5547 | -,3453 |
| Share of Partnerships & alliances (%) (effectuation) | 4,273 | 19 | ,000 | ,35000 | ,1785 | ,5215 |
| Share of Existing market knowledge (%) (causation) | -4,273 | 19 | ,000 | -,35000 | -,5215 | -,1785 |
| Share of Exploring contingencies (%) (effectuation) | -2,517 | 19 | ,021 | -,25000 | -,4579 | -,0421 |
| Share of Non predictive control (%) (effectuation) | -9,000 | 19 | ,000 | -,45000 | -,5547 | -,3453 |

One-Sample T-test for Case Problem 8

# Appendix D: Correlation matrix of think aloud data

**Correlations in Think Aloud data**

| | | Expected returns (causation) | Competitve analysis (causation) | Existing market knowledge (causation) | Predicition of the future (causation) | Means-based (effectuation) | Affordable loss (effectuation) | Partnerships & alliances (effectuation) | Exploring contingencies (effectuation) | Non predictive control (effectuation) |
|---|---|---|---|---|---|---|---|---|---|---|
| Goal-driven | Pearson Correlation | 0,629** | 0,700** | 0,274 | -0,246 | 0,454* | 0,362 | 0,514* | 0,159 | 0,489* |
| (causation) | Sig. (2-tailed) | 0,003 | 0,001 | 0,242 | 0,296 | 0,044 | 0,116 | 0,02 | 0,504 | 0,029 |
| | N | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Expected returns | Pearson Correlation | | 0,665** | 0,212 | -0,093 | 0,486* | -0,039 | 0,315 | 0,083 | 0,241 |
| (causation) | Sig. (2-tailed) | | 0,001 | 0,369 | 0,695 | 0,03 | 0,871 | 0,176 | 0,729 | 0,307 |
| | N | | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Competitve analysis | Pearson Correlation | | | 0,347 | -0,311 | 0,550* | 0,228 | 0,233 | 0,333 | 0,457* |
| (causation) | Sig. (2-tailed) | | | 0,134 | 0,181 | 0,012 | 0,334 | 0,323 | 0,152 | 0,043 |
| | N | | | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Existing market knowledge | Pearson Correlation | | | | 0,154 | 0,254 | 0,072 | 0,29 | -0,165 | 0,416 |
| (causation) | Sig. (2-tailed) | | | | 0,517 | 0,281 | 0,763 | 0,214 | 0,486 | 0,068 |
| | N | | | | 20 | 20 | 20 | 20 | 20 | 20 |
| Predicition of the future | Pearson Correlation | | | | | -0,194 | -0,378 | -0,139 | 0,034 | -0,101 |
| (causation) | Sig. (2-tailed) | | | | | 0,412 | 0,1 | 0,56 | 0,888 | 0,672 |
| | N | | | | | 20 | 20 | 20 | 20 | 20 |
| Means-based | Pearson Correlation | | | | | | 0,189 | 0,275 | -0,122 | 0,510* |
| (effectuation) | Sig. (2-tailed) | | | | | | 0,426 | 0,24 | 0,607 | 0,022 |
| | N | | | | | | 20 | 20 | 20 | 20 |
| Affordable loss | Pearson Correlation | | | | | | | 0,297 | 0,509* | 0,065 |
| (effectuation) | Sig. (2-tailed) | | | | | | | 0,204 | 0,022 | 0,785 |
| | N | | | | | | | 20 | 20 | 20 |
| Partnerships & alliances | Pearson Correlation | | | | | | | | -0,174 | 0,253 |
| (effectuation) | Sig. (2-tailed) | | | | | | | | 0,463 | 0,281 |
| | N | | | | | | | | 20 | 20 |
| Exploring contingencies | Pearson Correlation | | | | | | | | | 0,015 |
| (effectuation) | Sig. (2-tailed) | | | | | | | | | 0,949 |
| | N | | | | | | | | | 20 |

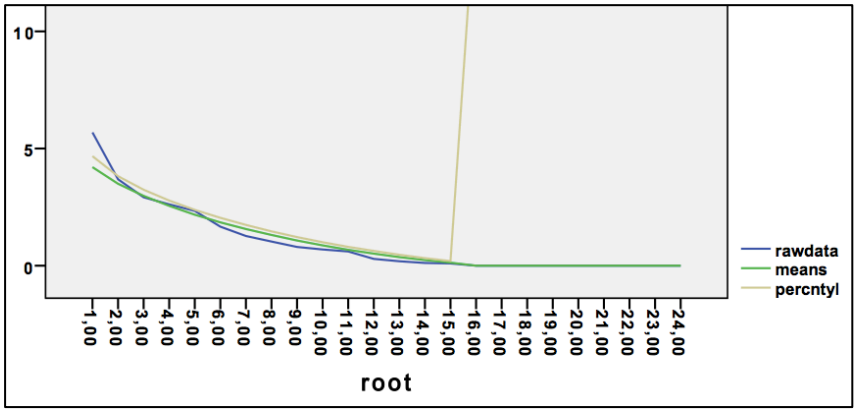
*** Correlation is significant at the 0.01 level (2-tailed)*

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

# Appendix E: Monte Carlo simulation

```
Run MATRIX procedure:

PARALLEL ANALYSIS:

Principal Components & Random Normal Data Generation

Specifications for this Run:
Ncases      16
Nvars       24
Ndatsets  1000
Percent     95

Raw Data Eigenvalues, & Mean & Percentile Random Data Eigenvalues
         Root      Raw Data        Means      Prcntyle
     1,000000     5,686829     4,204716     4,809168
     2,000000     3,686933     3,495644     3,920177
     3,000000     2,919643     2,978784     3,315912
     4,000000     2,617394     2,553710     2,838255
     5,000000     2,338202     2,175086     2,433360
     6,000000     1,665252     1,848625     2,087414
     7,000000     1,266516     1,565139     1,800573
     8,000000     1,030920     1,311653     1,506111
     9,000000      ,799546     1,073971     1,261428
    10,000000      ,691782      ,866176     1,043603
    11,000000      ,606221      ,676948      ,841806
    12,000000      ,289969      ,514445      ,666302
    13,000000      ,189511      ,365886      ,489355
    14,000000      ,116167      ,239678      ,347671
    15,000000      ,095116      ,129538      ,217605
    16,000000      ,000000      ,000000    16,000000
    17,000000      ,000000      ,000000    17,000000
    18,000000      ,000000      ,000000    18,000000
    19,000000      ,000000      ,000000    19,000000
    20,000000      ,000000      ,000000    20,000000
    21,000000      ,000000      ,000000    21,000000
    22,000000      ,000000      ,000000    22,000000
    23,000000      ,000000      ,000000    23,000000
    24,000000      ,000000      ,000000    24,000000

------ END MATRIX -----
```

Monte Carlo simulation




Scree plot of Monte Carlo simulation

# Appendix F: Exploratory Factor Analysis

**Component Matrix[a]**

| | C/E | Component | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| We analyzed long run opportunities and selected what we thought would provide the best returns | Causal | ,742 | | -,444 | | |
| We developed a strategy to best take advantage of resources and capabilities | Causal | ,557 | | | ,310 | -,476 |
| We researched and selected target markets and did meaningful competitive analysis | Causal | ,366 | -,615 | | ,389 | |
| We designed and planned business strategies | Causal | ,439 | | | | -,580 |
| We organized and implemented control processes to make sure we met objectives | Causal | ,652 | | ,603 | | -,309 |
| We had a clear and consistent vision for what we wanted to do | Causal | | | ,455 | -,488 | |
| We designed and planned production and marketing efforts | Causal | ,754 | -,309 | ,342 | | |
| Our decision making has been largely driven by expected returns | Causal | ,737 | | | | |
| The product/service we now provide is essentially the same as originally conceptualized | Causal | | -,485 | ,426 | -,497 | |
| It was impossible to see from the beginning where we wanted to end | Effectual | | ,673 | | -,529 | |
| We experimented with different products and/or business models | Effectual | | | ,482 | ,410 | ,467 |
| The ultimate product/service we now provide is substantially different from what we first conceptualized | Effectual | | ,544 | -,349 | ,486 | ,423 |
| We tried a number of different approaches until we found a business model that worked | Effectual | | | ,471 | ,709 | ,376 |
| We were careful not to commit more resources than we could afford to lose | Effectual | ,481 | | | | ,634 |
| We were careful not to commit more money than we were willing to lose with our initial business plan | Effectual | ,502 | -,310 | | -,368 | ,489 |
| We have allowed the business to evolve as opportunities have emerged | Effectual | | ,877 | ,300 | | |
| We adapted what we were doing to the resources we had | Effectual | ,415 | ,566 | | | |
| We were flexible and took advantage of opportunities as they arose | Effectual | | ,821 | | | |
| We avoided courses of action that restricted our flexibility and adaptability | Effectual | ,511 | | ,354 | | |
| We evaluated the set of resources and means we had at our disposal and thought about different options | Effectual | ,559 | | | | -,333 |
| We started out very flexibly and tried to take advantage of unexpected opportunities as they arose | Effectual | ,374 | | ,486 | ,497 | |
| We used a substantial number of agreements with customers, suppliers and other organizations and people to reduce the amount of uncertainty | Effectual | ,688 | | -,530 | | |
| We used pre-commitments from customers and suppliers as often as possible | Effectual | ,652 | | -,392 | | |
| We tried to get resource commitments and sales commitments as early as possible | Effectual | ,771 | | -,419 | | |

Extraction Method: Principal Component Analysis.

a. 5 components extracted.