The mediating role of failure in the relationships between Causation, Effectuation and performance of SMEs

'An analysis of SMEs in the Netherlands'

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The mediating role of failure in the relationships between Causation, Effectuation and performance of SMEs

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Foreword and Acknowledgements

This thesis is written for the award of the Master of Science degree in Business Administration at the University of Twente. It entails a study of the mediating role of failures in the relationship between the entrepreneurial approaches of Causation, Effectuation and performance in Small and Medium Sized Enterprises.

The topic of this thesis is for some not so common and is one that most people try to avoid, failure! However, for me a tool to learn and improve. As child, I learned from playing, as student entrepreneur I learned from experimenting with business models for my own company and now as manager at TSM Business School I still do both, which means that I still learn from making failures. Sometimes it is painful, sometimes it is fun, but above all it make me a better manager and helps me to cope the future. But how bad are those failures I make? Does it influence the performance of my organization? And if yes, in which way? It is my strong conviction that it brings me and my organization success. But is that empirical proven? This thesis is a journey to an answer for that gut feeling.

My thanks go out to many people. First of all to Jeroen Kraaijenbrink and Martin Stienstra for supervising me and their constructive input during this research. Secondly, to my Employer TSM Business School for providing me a sample on which this research could be conducted but above all for the time, patience and space TSM has given me during my Master studies. As a results of this I would like to thank all the 133 respondents, ambassadors of TSM Business School, for their time and effort in cooperating in this research. Especially because the data collection lasted so long and they were importuned with e-mails and phone calls. Furthermore, I would like to thank my colleagues and my fellow graduate students who were willing to discuss findings and provide some new insights on a variety of topics. Last but not least, my thanks go out to my family and my girlfriend for their support over the duration of the thesis and my time at the University of Twente.

Ernst Eijsvogel

Enschede, August 2014

ABSTRACT

Over the past few decades, education pedagogy has primarily been based on the use of causation, and therefore predominantly used by managers and entrepreneurs. The emergence of the theory of effectuation questions the applicability of causation-based models and shed new light on entrepreneurial processes. Causation and effectuation are two alternative approaches that entrepreneurs use in the venture development process (Sarasvathy, 2001a). Causation can be seen as a planned strategy approach with the underlying logic of prediction, as opposed to effectuation as an emergent strategy approach based on non-predictive control. Using an approach based on effectuation enhances the possibility of failure, in contrast to an approach based on causation, but effects of these failures lack empirical evidence. This research contributes to filling this gap, by investigating the role of failure in the relationships between effectuation and performance and causation and performance.

Based on literature review and focus group sessions with a panel of scholars and entrepreneurs, a conceptual framework was built to test relationships between causation, effectuation, failure and performance of SMEs. The literature review revealed that failures mediate the relationships between causation, effectuation and performance and that a scale for measuring failures needs to be developed, due to a lack of operationalization in the area of entrepreneurship. The mediating role of failures was expected to be positive in the relationship between effectuation and performance, and negative in the relationship between causation and performance.

An online research survey was used to collect the data from a sample of entrepreneurs of SMEs, who completed a management development program of TSM Business School, called Ondernemend Directievoeren. For the questionnaire new scales were developed to measure causation, effectuation and failure correctly. A total of 133 responses were received, of which 101 were useful, a response rate of 32,4%. After assessing the data for reliability and validity, correlation and regression analyses were performed to test the relationships. By missing significant effects of causation and effectuation on failure and performance, the mediating role of failures could not be determined and all the hypotheses were rejected to a lesser or higher degree.

However, important findings were made. In absence of direct effects of the main constructs of causation and effectuation, the constructs were investigated at a finer level of granularity and analyzed at dimension level. This resulted in several significant findings, albeit to less reliable measurement models. Due to the low levels of reliability of the causation and effectuation dimensions and the sampling bias of this study, it can only be concluded that the sub-dimension affordable loss is significantly related to failures and its sub-dimension impact of failures. Besides these empirical findings, this study developed a reliable (α = 0.81) and valid scale for measuring failures in SMEs, and questions the reflective nature of the construct of effectuation. Based on the significant findings of some of the effectuation dimensions, the lack of significance in the main construct of effectuation, and low explained variance of all regression models, this study suggests to view effectuation as a formative construct.

The findings of this study contribute to theory in several ways. First of all, it provides empirical evidence of effects of causation and effectuation dimensions. Secondly, it offers new insights into the role of

failure in its relationship with causation, effectuation and performance. Thirdly, it provides empirical evidence of the formative nature of the construct of effectuation. Finally, by developing a scale to measure failure in SMEs it provides an opportunity to expand the research on this topic. The findings of this study enrich practice as well. They address the upside potential of failure, showing that experimenting with as many strategies as possible within given means does not necessarily lead to bigger failures and that failures actually act as stepping stone to spot new opportunities for SMEs.

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1 INTRODUCTION AND RESEARCH DESIGN

1.1 Background

During the last decades the interest in entrepreneurship has increased. Not only the number of people engaging in entrepreneurial activities is increasing, but also interest among business school students is growing (Shane, 2003). Entrepreneurship as a career option becomes more and more desirable and as a response to this, universities and business schools have increased their offerings of entrepreneurship programs. However, most of the current entrepreneurship education still relies on the linear process of planning. It is based on a goal driven, deliberate model of decision making (Perry, Chandler, & Markova, 2012), referred to by Sarasvathy (2001a) as a causation model. But can entrepreneurship be approached in this traditional way by planning and prediction? Or should it differentiate from typical business education since business entry can be regarded as a fundamentally different activity than managing a business? Of course, it depends on the situation of the entrepreneur. But one thing is for sure, the research in the field of entrepreneurship has changed the way entrepreneurship can be approached dramatically during the last decades.

The role of planning has been debated since the 1960s and resulted in fierce debates between Igor Ansoff and Henry Mintzberg. While Ansoff sees a curial role for planning in strategy, Mintzberg, argued that planning is futile and that firm should adopt a more emergent leaning approach (Mintzberg, 1990)(Ansoff, 1991). In the last decade a similar debate appeared, when scholars posed more and more questions about this traditional type of reasoning in entrepreneurial and uncertain environments. As a results of this, adaptive models of the entrepreneurial process were developed (Baker & Nelson, 2005) (Sarasvathy, 2001a). Such models consider entrepreneurship as a means-driven, risk averse and non-linear process, referred to by Sarasvathy (2001a) as an effectuation model. Sarasvathy (2001a) ignited this change with her groundbreaking research to the unique behaviors of expert entrepreneurs and broke the planning-emergence dichotomy into finer grained distinctions.

Sarasvathy introduced effectuation as a logic of entrepreneurial expertise, an entrepreneurial process that is an inverse of the classical causational process. According to Sarasvathy (2001a) causation is the process in which an entrepreneur takes a particular effect as given and focuses on selecting between means to create that effect, while effectuation is the process in which the entrepreneur takes a set of means as given and focus on selecting between possible effects that can be created with that set of means (Sarasvathy, 2001a). To clarify the difference, Sarasvathy (2001a) uses a simple metaphor (p. 245): a chef is asked to cook dinner for guests. Following the causational process this would mean that the guests choose a dish from the menu, the chef shops for the necessary ingredients and cooks the meal. In this case the end is given by the guests and is predictable, the focus of the chef is on acquiring, and selecting between, the available means to create that particular effect, the meal. Following an effectual process, the guests would ask the chef to imagine a possible dish based on the available ingredients, the means, in the kitchen. This time, the means are given and the chef focuses on what can be achieved with them in order the create the best possible dish.

By using effectual logic the chef is trying something new in order to find success. By making this new dish, with the available "means", he could find a great new dish for his menu and satisfy his customers. On the other side, he could make mistakes with new techniques or ingredients. So trying something new can enhance the chance of failures.

But how bad is it to make failures? Failures are mostly seen as something that should be avoided, as painful and costly (McGrath, 1999). However, failures provide important learning opportunities and can play an important role in the development of a firm. Failures acts as *"stepping stone to spot new opportunities and improve business processes, increasing an entrepreneur`s probability of future success by using it as an instrument to learn"* (Cope, 2011, p. 606). Since most entrepreneurship research focuses on factors of success and survival rather than failures, investigating failures can be of great importance for both, theory and practice (Shane, 2001) (Baumard & Starbuck, 2005) (Cope, 2011). Evidence of the effects of causation and effectuation on failures are scare and contributions to this could be of great importance.

Within the effectuation discourse two interesting results are found of the effects of effectual strategies on failures. Wiltbank, Read, Dew and Sarasvathy (2009) found in their study of angel investors that investors who use entrepreneurial approaches based on control, experience fewer failures without experiencing fewer 'homeruns' (Wiltbank, Read, Dew, & Sarasvathy, 2009). Along the same line, Dew, Sarasvathy, Read and Wiltbank (2009b) found in their study of the 'plunge decision' that entrepreneurs who use entrepreneurial approaches based on affordable loss are likely to lose less than prediction-oriented entrepreneurs. According to Dew et al. (2009b), reduces a focus on affordable loss the cost of failures for the entrepreneur, irrespective of the probability of failure. This means according to Kraaijenbrink, Ratinho and Groen (2012) that entrepreneurial approaches based on control leads to more, but smaller failures without a reduction of 'big hits'. These findings imply that effectual strategies leads to more and smaller failures with lower costs.

Combining these insights some interesting opportunities emerge. First, it opens up the question whether a difference in the entrepreneurial approaches of causation and effectuation leads to a difference in failure. And secondly, when those failures are made how they influence the performance of a firm.

1.2 Research objective
As explained in the previous paragraph, a gap is identified. This gap is: a lack of empirical evidence of a possible influence of the entrepreneurial approaches of causation and effectuation on failure and its subsequent influence on firm performance. Therefore the purpose of this research is to test the mediating role of failure in the relationships between the entrepreneurial approaches of causation and effectuation and the performance of SMEs.

The theoretical foundation in this research is the work of Sarasvathy (2001a) on causation and effectuation and the work of Cardon, Stevens and Potter (2011) on failure. A detailed description of both theories will be given in the theoretical framework.

If empirical evidence of the mediating role of failure in the relationships between causation, effectuation, failure and performance can be found, an important step in entrepreneurship research can be made. Besides empirical evidence of the effects of effectuation, important implications for practice, and in this case for my employer TSM Business School, can be found. Implications in favor of the use of effectuation in entrepreneurship education.

1.3   Research questions

In order to achieve the abovementioned research objective, the following central research question is formulated:

What are the effects of the entrepreneurial approaches of causation and effectuation on failure and how do those effects influence the performance of an SME?

To answer this central research question, it is subdivided into the following research questions. These research questions will provide an answer to the central research question:

I.   How do the entrepreneurial approaches of causation and effectuation relate to failure?
II.   How does failure relate to the performance of an SME, which entrepreneurial approach is based on causation and effectuation?

After answering these research questions in chapter 4, the central research question will be addressed in chapter 5, the conclusion.

1.4   Important definitions

In order to delineate the research the following definitions are used throughout this thesis.

Causation: *"Causation processes take a particular effect as given and focus on selecting between means to create that effect"* (Sarasvathy, 2001a, p. 245). *"The logic for using causation processes is: To the extent that we predict the future, we can control it"* (Sarasvathy, 2001a, p. 252).

Effectuation: "*Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means*" (Sarasvathy, 2001a, p. 245). "*The logic for using effectuation processes is: To the extent that we can control the future, we do not need to predict it*" (Sarasvathy, 2001a, p. 252).

Failure: Giving one clear definition of failure is difficult, since it does not exist in the literature (Ropega, 2011). In the last two decades several terms have been used: failure defined as bankruptcy, decline, discontinuance or termination as result of fallen short of its goals (Watson & Everett, 1999) (Cope,

2011). Furthermore it is important not to confuse failure with business closure, which involves the voluntary termination of a venture (Cope, 2011) and to differentiate between failure of the entrepreneur and failure of their firm (Cardon, Stevens, & Potter, 2011), whereby this study focuses on the latter, failure of the firm. For this study the following definition, based on Watson and Everett (1999), is used: failure is an action that leads to any form of loss (loss of time, money, reputation, customers or suppliers) to an organization.

Performance: Representation of the organization in terms of turnover-, profit-, market share-, and personnel-, growth per year (Delmar, Davidsson, & Gartner, 2003).

Small and medium sized enterprise: "*enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million. Within the SME category, a small enterprise is defined as an enterprise which employs fewer than 50 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 10 million*" (European Commission, 2003, p. L124/39). Micro enterprises, companies with less than 10 employees, are excluded from this study.

1.5   Outline of the thesis

In the first chapter my motivation for this thesis is given. The background gives a preview of the research and addresses the central elements of my thesis. In the previous section the research objective, research question and most important definitions for this thesis are formulated. In chapter 2 the theoretical framework, hypotheses and causal model are given. In the theoretical framework the most important concepts of this thesis, causation, effectuation, failure and performance are defined. Based on this theoretical framework the hypotheses for this research are formulated and the causal model is visualized with the expected relationships. Chapter 3 consists of the methodology section. This chapter comprises the research approach as well as the data collection, the research measures and the response rates. Chapter 4 contains the actual data analyses and reports the results of the study. It will show if the hypotheses are confirmed or rejected. Finally, chapter 5 concludes this thesis by discussing the theoretical findings with the practical findings, and drawing a conclusion. Furthermore limitations of and implications for this thesis are given as well as recommendations for further research.

2 THEORY AND HYPOTHESIS

In this chapter a literature review will be conducted regarding the main concepts of this thesis, causation, effectuation, failure and performance. The chapter starts with an extensive explanation of all the concepts involved in this study and will be followed by establishing theoretical connections between the concepts of causation, effectuation and failure and performance. By doing this the existing literature is examined on what is already known and addresses opportunities for hypotheses regarding the current theory, which are formulated in paragraph 2.4 and 2.5. The last paragraph, paragraph 2.6, graphically depicts the causal model with hypothesized relationships from the previous sections.

2.1 Entrepreneurial processes

Entrepreneurs who consider starting a new venture might see or create an opportunity. Scholars question themselves if opportunities exists to be discovered, or that opportunities are created by the actions of entrepreneurs (Alvarez & Barney, 2007). In beginning of the research to entrepreneurship it was assumed that opportunities were found through formal search processes. However, this way of entrepreneurial thinking has shifted to how, in the absence of future goods and markets, firms come in to existence (Shane & Venkataraman, 2000) (Read, Song, & Smit, 2009). One of the scholars who ignited this change is Sarasvathy (2001a) with her research to effectuation. The effectuation theory of Sarasvathy (2001a) offers an alternative view of how opportunities come into existence compared to the traditional causation based theories. Effectuation does not assume that opportunities are waiting to be discovered but that opportunities emerge when created by entrepreneurs and its partners.

Causation and effectuation are two different types of entrepreneurial processes. According to Bygrave & Hofer (1991) entrepreneurial processes are *"all the functions, activities and actions associated with the perceiving of opportunities and the creation of organizations to pursue them"* (Bygrave & Hofer, 1991, p. 14). In the past decades many different views on entrepreneurial processes were given by scholars. The most known views are the views of the 'school of planning' and the 'school of learning'. The 'school of planning' suggest that business planning improves the effectiveness of human action and facilities goal achievement (Ansoff, 1991) where the 'school of learning' suggest that flexibility, instead of planning, is essential to be able to deal with an uncertain environment (Mintzberg H. , 1990). However, in literature several theories to the entrepreneurial process exist. Theories like bricolage (Baker & Nelson, 2005), opportunity discovery (Kirzner, 1997 as cited in Moroz & Hindle 2011), effectuation (Sarasvathy, 2001a), intentions (Krueger, Reilly & Casrud, 2000), counterfactual thinking (Gaglio, 2004), and innovation (Drucker, 1985) came in to existence and gave different possibilities for the entrepreneurial process. Moroz and Hindle (2011) found that 32 entrepreneurial process models exist in literature. In their research they tried to find a single harmonized model of the entrepreneurial process and tested the 32 models on distinctness, generality, accuracy and simplicity. Distinctness was chosen in order to see if the models apply to entrepreneurship instead of management in general, generality was chosen in order to check if the models are capable of getting the label 'entrepreneurship', accuracy was chosen in order to test if there is an evidential basis for process claim of the models, and finally simplicity was chosen in

order to test if the model was not too complex as a guide for practitioners and researchers. After a thoroughly investigation, only four models, the models of Gartner (1985), Bruyat and Julien (2000), Sarasvathy (2001a) and Shane (2003), were selected based on the criteria. However, the results of these four models showed that the thoughts on entrepreneurial processes are very fragmented and that no single harmonized model of the entrepreneurial process could be extracted (Moroz & Hindle, 2011). The only aspect that all models had in common was the belief that a process-based approach is important to understand the concept of entrepreneurship. Moroz and Hindle (2011) found that except the effectuation theory of Sarasvathy (2001a) most of the 32 process models were built on causation-based theories and that the effectuation theory was the only theory that made a difference between types of entrepreneurs and non-entrepreneurs, indicating that there could be a difference in thinking about the entrepreneurial process. She states that effectuation is the inverse of causation and uses a multi-dimensional constructs with 5 separate dimensions to compare both models. This makes the entrepreneurial approaches of causation and effectuation particular relevant for entrepreneurship research and education.

2.2   Causation versus Effectuation

2.2.1   Introduction
In the last decade research to emergent effectual approaches gained a lot of attention due to the groundbreaking research of Sarasvathy (2001a) to effectuation. Effectuation questions the universal applicability of causation-based models and shows new insights in what situations emergent strategies can be more useful instead of planning.

The empirical basis for Sarasvathy`s effectuation theory was established in 1998, when Sarasvathy published her cognitive science-based dissertation work. The existence and prove of effectuation was set out in Sarasvathy (2001a) and Sarasvathy (2001b). In these papers Sarasvathy argued that effectuation is the inverse of causation and the predominant logic expert entrepreneurs use in decision making. Sarasvathy was intrigued by, and based her effectuation model on, the work of several scholars as Knight, March, Simon and Weick. Knight`s notion of a fundamentally unknown future, March`s ideas on exploration and the challenge to preexistent goals (as presented in his "garbage can model"), Mintzberg`s gathering of evidence against planning and prediction, Simon`s notion of bounded rationality and Weick`s notion of enactment are all integrated in the effectuation model (Sarasvathy, 2001).  Knight`s (1921, as referred to in Sarasvathy (2001a)) uncertainty points at the fundamentally unknown future. An unknown future that many entrepreneurs face when starting their business and in which they can not to predict the changes of success. In such an unknown future where predictions are not possible , for example: a non-existing market, entrepreneurs have to rely on other ways, then there causal planning or market research, to guide their activities. March`s (1978) work on the "garbage can model", in which rational choices contain guesses about the consequences of the uncertain future and Simon`s (1991) notion of bounded rationality, stresses the essential goal ambiguity and limited rationality of organizational decisions. This means that in an effectuation model goals are initially

ambiguous and become specific over time in contrast to the causation model, where the goals are set from the beginning. Finally, the Weickian enactment is important to the effectuation model(Weick 1979 as cited in Sarasvathy (2001a). Weickian enactment implies that entrepreneurs deal with ambiguity through social construction, which means that they select and create their environment through their own actions (Santos & Eisenhardt, 2009). Sarasvathy (2001a) integrated the insights of Knight, March, Mintzberg and Weick introducing:

"A model of effectual reasoning that explicitly addresses (1) a logic of control (rather than prediction), (2) endogenous goal creation, and (3) a (partially) constructed environment. Additionally, building upon the preceding theories' sub concepts, which basically pose a disconnect of intention, action, and meaning, here I show how effectuation inverts causal reasoning to indicate a new connection among means, imagination, and action that helps generate intentions and meaning in an endogenous fashion" (p. 256).

Based on this explanation Sarasvathy (2001a) embodied the process of effectuation in five dimensions that can be seen as the core of a rudimentary theory of effectuation, as opposed to the process of causation. Table 1 provides an overview of the differences.

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

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

2.2.2   The characteristics of Causation and Effectuation

In the years after the breakthrough of Sarasvathy`s (2001a) work on causation and effectuation, research on effectuation continued. Scholars like Dew, Read, and Wiltbank cooperated with Sarasvathy to expand research on effectuation.  Amendments in Sarasvathy`s (2001a) effectuation model and distinguishing characteristics were made, by for example Sarasvaty and Dew (2005a), see appendix 1, and led to the following five dimensions on which causation and effectuation can be distinguished (Dew, Read, Sarasvathy, & Wiltbank, 2009a) (Dew, Sarasvathy, Read, & Wiltbank, 2009b) (Sarasvathy, 2008) (Wiltbank, Dew, Read, & Sarasvathy, 2006):

 1) Goal driven versus means driven action; This dimension makes a distinction between means-driven and goal-driven action. Causation is goal driven, which means that entrepreneurs have a clear vision of the desired future and acts on that vision with predetermined goals. Effectuation on the other hand is mean driven. This means that entrepreneurs act based on the current situation and what is available. People can have three categories of means available to them: who they are (traits, tastes, and abilities), what they know (education, experience and expertise) and whom they know (social networks). Based on this information effectuators strive to achieve the highest possible within their control of action. *2) Expected return versus affordable loss;* Causal models focus on maximizing the expected return for a decision by selecting the optimal and most promising strategy. In contrast, effectual models focus on affordable loss and base their decision on what he or she is willing to lose and try to experiment with as many strategies as possible within their available means. *3) Competitive analysis versus partnerships;* This dimension makes a distinction between competitive analysis and partnerships. Causal models use competitive analysis and strategic planning in order to reduce uncertainty. Product-market combinations are carefully chosen and are the result of an extensive analysis of a firms environment. Effectual models on the other hand use strategic alliances and partnerships to control uncertainty and erect entry barriers. For this reason, they try to get the stakeholders 'on board' and allow those stakeholders to participate actively in shaping the firm. *4) Avoiding versus leveraging contingencies;* This dimension distinguishes avoiding from leveraging contingencies. Entrepreneurs who focus on causation try to avoid unpleasant surprises, while they work on a predetermined goal in order to receive the maximum result. They see unexpected surprises as a threat. In contrast, effectuators see uncertainty as a resource and an opportunity, they strive to turn the unexpected into the something valuable and profitable. They are able to do this since their goals are loose settled. Their goals can be changed when a contingent event occurs. *5) Prediction of a risky future versus controlling an unpredictable future;* Causal models focus on the predictable aspects of an uncertain future, while effectual models focus on the controllable aspects of an uncertain future. The underlying logic for causation is 'to the extent that the future can be predicted, the future can be controlled'. The underlying logic for effectuation is 'to the extent that the future can be controlled, the future does not need to be predicted'. The dimension of control can be especially useful in areas where human action is the predominant factor for shaping the future.

2.2.3 The Effectuation cycle

An important notion that emerged from Sarasvathy`s early work and the contrasting dimensions above is that effectuation is not always preferred. Causation and effectuation are more relevant in certain contexts. Since effectuation assumes an unpredictable future, goal ambiguity and entrepreneurs who enact their environment it is more useful in dynamic environments, whereas causation needs circumstances that do not satisfy these requirements and therefore suits static environments like a firm that has grown significantly and operates in markets that already have been created (Sarasvathy & Dew, 2005b). This dynamic model of effectuation is illustrated figure 1.
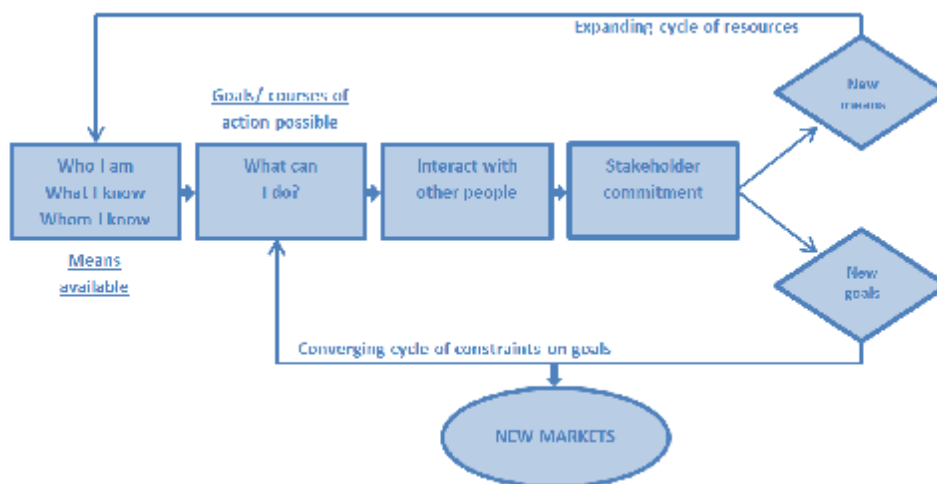
Figure 1 - Dynamic model of Effectuation (Sarasvathy & Dew, 2005b, p. 543)

The dynamic model of effectuation starts with the actual means available: who I am, what I know, and whom I know. Based on these available means you will decide what you can do with them and contact people you know. Thereafter partnerships and pre-commitments will be set up and might result in new and probably unexpected means and goals. These new means and goals can create two cycles. The first cycle, which goes from new means to means available, expands your resources and enables you to start the process again with judging what you can do with these new means. The second cycle, which goes from new goals to courses of action, enables you to change the available goals and finally results in new judgments of action where after the process starts again and again.

2.2.4 The Causation cycle

The dynamic model of effectuation is in sharp contrast to the causational process illustrated by Read, Dew, Sarasvathy, Song and Wiltbank (2009) and is shown in figure 2. The main assumption of this causational process is predictability of an uncertain future as described above in the contrasting dimensions of causation and effectuation. Therefore the predictive process starts with identifying opportunities, which means that opportunities are discovered instead of created as in the dynamic model of effectuation. After the discovery of an opportunity market research will be done to create a

business plan. In this business plan goals are formulated and the process of reaching these goals by acquiring necessary resources and stakeholders will be described and started. Since the environment change over time the company has to adapt to these changes in order to stay competitive in the long run.
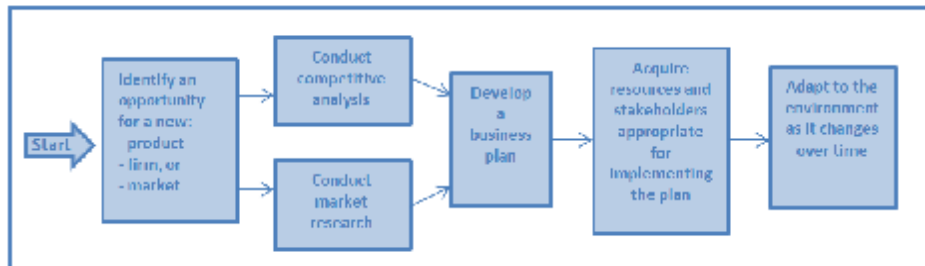
Figure 2 - The predictive process of Causation (source: Gartner, 1985 as cited in Read et al., 2009, p. 4)

2.3   The development of Effectuation

Since the research of Sarasvathy (2001a) to causation and effectuation only a few researchers have attempted to model and test effectuation. This is surprising since effectuation suggests how individuals might act in situations in which the assumptions of causation are not met and because of the potential contribution which can be made with research to this topic (Perry, Chandler, & Markova, 2012). Due to the nascent state of the development of effectuation most of the research that is done up to now is conceptual. The contributions of these conceptual studies are descriptions of how, when, and why effectuation can be used in contrast to causation. Subsequently, studies started to link effectuation to other constructs and proposed testable hypotheses. However up to now just a few dozen empirical studies have been performed and most of them were experimental studies.

One of those experimental studies was the study of Dew, Read, Sarasvathy and Wiltbank (2009a). These authors found in their think-aloud study with 27 expert entrepreneurs and 37 MBA students, which can be seen as an extension of Sarasvathy (1998) dissertation, that entrepreneurial experts frame decisions using an effectual logic while novice entrepreneurs, MBA students, use more causational logic and try to plan, predict and plan. The research revealed that 63% of the expert entrepreneurs used effectual logic more than 75% of the time while 78% of the MBA students did not use effectual logic at all. Based on the same data Read et al. (2009) concentrated on the marketing decisions of both groups. Also, these results show significant and the same differences between expert entrepreneurs and MBA students using effectual logic. *"While those without entrepreneurial expertise rely primarily on predictive techniques, expert entrepreneurs tend to invert these. In particular, they use an effectual or non-predictive logic to tackle uncertain market elements and co-construct novel markets with committed stakeholders"* (Read, Dew, Sarasvathy, Song, & Wiltbank, 2009, p. 4). Besides these experimental studies, a few field studies were conducted. However, these studies showed mixed and inconclusive results on both, the construct and dimension level of causation and effectuation (Perry, Chandler, & Markova, 2012).

The first field study that was done was performed by Chandler, DeTienne, McKelvie and Mumford (2009). They performed a validation study for causation and effectuation measures. They developed measures for the constructs of causation and effectuation in order to test the dimensionality of both constructs, as suggested by Sarasvathy (2001a). The results of their study shows that the causation appears to be a well-defined and coherent set of practices that can be viewed as a, reflective, uni-dimensional construct. But in contrast with Sarasvathy (2001a), effectuation appears to be a loosely defined and loosely related set of practices in which the items that reflect effectuation were not significantly related with each other. Chandler et al. (2009) proposed that effectuation might be better viewed as a formative, multidimensional construct composed of four dimensions: affordable loss, experimentation, flexibility, and precommitments.

Also Brettel, Mauer, Engelen and Küpper (2011) performed a field study in which they developed and tested the constructs of causation and effectuation in a R&D context. In contrast to the study of Chandler et al. (2009) this study incorporates causation and effects as independent variables instead of dependent variables. By using a qualitative and quantitative scale-development process Brettel et al. (2011) developed a research model which links four effectual dimensions and their causal counterparts in R&S projects to R&D project performance in terms of efficiency and output for different degrees of project innovativeness. The findings showed that the principles of affordable loss, partnerships, and leveraging contingencies have positive impact on the output or efficiency of R&D projects involving high innovativeness. Furthermore it was found that causation has a positive impact on the output or efficiency for R&D projects which involve low uncertainty. This was supported by the dimensions goal-driven, expected return and avoiding contingencies.

According to Kraaijenbrink, Rantinho and Groen (2011) the inconclusive results of the studies to the construct of causation and effectuation can be explained by an inappropriate dichotomizing. They suggest that causation and effectuation should be investigated at a finer level of granularity, at dimension level. The dimensions should be treated as independent constructs in order to give more consistent results. Confirmation of these expectations were found by the same authors in their subsequent study (Kraaijenbrink, Ratinho, & Groen, 2012). They found in their study to 102 business plans of small firms that means versus ends and prediction versus control are independent orthogonal dimensions. These results confirm the findings of the study of Wiltbank et al. (2006), who proposed that prediction and control are independent dimensions and with these dimensions four different combinations of strategies can be made (planning, adaptive, transformative, and visionary).

In contrast to what Sarasvathy (2001a) suggested, that effectuation is the inverse of causation, the abovementioned studies found empirical evidence of the independent existence of some of the causation and effectuation dimensions. This means that entrepreneurs do not have to rely solely on causation or effectuation but that entrepreneurial strategies can be applied which include elements of both constructs.

2.4 Entrepreneurial failure

Failure is an important phenomenon in entrepreneurship and has gained attention in the last two decades by scholars. Entrepreneurs always hunt for success and try to avoid failure. Therefore, most of the entrepreneurship literature focus on factors of success and survival rather than failure (Shane, 2001). Most entrepreneurs regard failure as something bad, something to be avoided, because *"it can be painful and costly, can generate vicious cycles of discouragement and decline, and can obviously be mismanaged"* (McGrath, 1999, p. 16). Though failure can also be quite functional, it can provide learning opportunities, improve competences and can create new opportunities for entrepreneurs (Shepherd, 2003) (Cope, 2011) (McGrath, 1999) (Zacharakis, Meyer, & DeCastro, 1999) (Cardon, Stevens, & Potter, 2011) (Baumard & Starbuck, 2005).

According to Cope (2011) failure acts as `stepping stone` to explore opportunities, improve processes and as tool to learn from the past. He states that *"failure is invaluable in understanding alternative and more effective ways of acting in the future"* (Cope, 2011, p. 606). These findings are in line with previous work, i.e. the work of McGrath (1999), who concludes that failure enables learning opportunities and business development within a firm. Shepherd (2003) found, in his study to grief recovery for the self-employed, that learning from failure is also beneficial for the society. Where the value lies in the application of gained knowledge in subsequent businesses. Additionally, Staw and Barsade (1993) argued that negative feedback from failure is more important than positive feedback because it motivates entrepreneurs to overcome the gap between failure and desired outcome. Baumard and Starbuck (2005) found in their study to strategic failures in European telecommunication firms that their *"most surprising discovery has been that learning from repeated success makes future failure very likely. Long periods of continued success foster structural and strategic inertia, extreme process orientations, inattention and insularity"* (Baumard & Starbuck, 2005, p. 283). Also Sitkin (1992) states that failing is more important than success for learning. In his article, he demonstrates that not all failures facilitate learning, according to him *"intelligent failures"* which are small and relatively harmless are the ones that are most effective in fostering learning. These `intelligent failures` stimulate search for potential solutions, and motivate people to improve.

In order to find the causes of those failures the literature suggest to examine the factors and implications of failures. Due to the importance of failure in the entrepreneurial process, several studies have examined factors that lead to failures. According to Ropega (2011) *"An entrepreneur is recognized in the literature as the most critical factor in the failure of small businesses"* (Ropega, 2011, p. 479). This because management motivation, skills, and abilities have an direct impact on how business is managed. Secondly, Ropega (2011) address insufficient capital of small businesses as important factor of failure in SMEs. Also Zacharakis, Meyer and DeCastro (1999) state that contrary to what should be expected not external factors as competitive market conditions or financial problems but especially internal factors in the form of management problems attribute to venture failures. Furthermore, Thang and Boon (1996) conclude in their study of factors affecting the failure of local small and medium sized enterprises that *"endogenous factors were viewed by respondents as more critical in causing SME failures than*

exogenous factors" (Theng & Boon, 1996, p. 47)*.* In line with these findings, Cardon et al. (2011) proposed a model of the two main categorical causes of entrepreneurial failure, misfortune and mistakes. *"The category of misfortunes includes failures attributed to things outside of the control of the entrepreneur but critical to the venture's outcome—unavoidable difficulties, such as a poor economy or a natural disaster. The category of mistakes includes failure events attributed to individual error, such as inadequate ability or effort, improper strategies, or poor business models"* (Cardon, Stevens, & Potter, 2011, p. 82)*.*

2.4.1 Causation and Effectuation in relation to failure

Within the effectuation discourse Wiltbank et al. (2009) found in their study to predictive and non-predictive control strategies of 121 angel investors operating in uncertainty that *"angels who emphasize prediction make significantly larger venture investments, while those who emphasize non-predictive control experience a reduction in investment failures without a reduction in their number of successes" (Wiltbank, Read, Dew, & Sarasvathy, 2009, p. 116).* These findings provide empirical evidence for applicability of effectuation and in specific the use of non-predictive control strategies such as affordable loss and mean based opportunity creation in uncertainty. They show that angel investors can limit their downside failures through a control-based approach and that angel investors who use a prediction-based approach make significant larger investments, but do not experience more - `homeruns' - investments that generate profits.

According to Sarasvathy (2001a) and Chandler, DeTienne, McKelvie and Mumford (2009) this can be explained by the use experimentation. Last mentioned stated that experimentation, *"a series of trial and error changes pursued along various dimensions of strategy, over a relatively short period of time, in an effort to identify and establish a viable basis for competing" (Chandler, DeTienne, McKelvie, & Mumford, 2009, p. 380)*, is done by effectuators to test different approaches in the marketplace. According to Chandler et al. (2009) *"experiments that turn out poorly are truncated early and the entrepreneur can explore other avenues" (Chandler, DeTienne, McKelvie, & Mumford, 2009, p. 380)* until the best fit is found. This indicates that approaches based on effectuation make more failures compared to approaches based on causation.

Based on these findings the following hypotheses are formulated:
H1a: SMEs with a high emphasis on causation in their entrepreneurial approach will make less failures than SMEs with low emphasis on causation.
H1b: SMEs with a high emphasis on effectuation in their entrepreneurial approach will make more failures than SMEs with low emphasis on effectuation.

According to Dew et al. (2009b) and Wiltbank et al. (2009) entrepreneurs who base their approach on effectuation, do not only make more failures than those who base their approach on causation but also smaller failures. The reason for this is that effectuation emphasizes affordable loss and the controllable aspects of an unpredictable future where causation emphasizes expected return and the predictable aspects of an uncertain future. *"Affordable loss lessens the impact of possible failure because it makes*

failure clearly survivable by constraining the loss to something that the entrepreneur regards as affordable and is willing to lose in order to pursue the venture (the venture is considered worth doing even if the invested amount is lost)" (Dew, Sarasvathy, Read, & Wiltbank, 2009b, p. 114). So entrepreneurs using affordable loss are almost always likely to lose less than entrepreneurs using prediction. It is in this sense that entrepreneurs using affordable loss reduce the costs of failure, regardless of the probability of a failure (Dew, Sarasvathy, Read, & Wiltbank, 2009b). Also the findings of Wiltbank et al. (2009) show that emphasizing control based approaches is related to experiencing fewer negative exits, and that entrepreneurs using prediction based approaches make significantly larger investments without experiences more `big-hits` (Wiltbank, Read, Dew, & Sarasvathy, 2009).

In addition to this, Brown and Eisenhardt (1997) found in their study to changing organizations that in order to innovate experimentation is a relatively low cost method of 'probing into the future' because it enables a firm to test different options in the market. Since effectuators predetermines how much loss is affordable and focus on experimenting with as many strategies as possible to probe the future, they are able to truncated those experiments that are not viable at relatively low costs and shift investments to other experiments in order to find a business model that works (Brown & Eisenhardt, 1997). On the other hand causation approaches focus on maximizing the potential return using extensive market analysis (Sarasvathy, 2001a) in order to achieve a certain goal. One of the consequences of this approach could be that a firm sticks to its strategy despite a changing environment or market, postpone the decision to quite resulting in bigger failures (Dew, Sarasvathy, Read, & Wiltbank, 2009b).

 Based on these findings the following hypotheses are formulated:
H2a: SMEs with a high emphasis on causation in their entrepreneurial approach make bigger failures, with a higher impact on the firm, than SMEs with low emphasis on causation.
H2b: SMEs with a high emphasis on effectuation in their entrepreneurial approach make smaller failures, with a lower impact on the firm, than SMEs with low emphasis on effectuation.

Besides a difference in number and size of failure another difference can be expected in the relation between the entrepreneurial approaches of causation and effectuation and failure, namely the recognition time of a failure. As mentioned before effectual entrepreneurs use affordable loss and experimentation. Since affordable loss assumes that entrepreneurs set an upper bound on what they are willing to lose and entrepreneurs use experimentation to probe the future they are continuously trying new business models in order to retrieve information from their environment about the possibilities of their probes. By using these probes the entrepreneurs are not only able to see if the probes have potential, it enables them to see potential failure in an early stage (Dew, Sarasvathy, Read, & Wiltbank, 2009b).

On the other side, entrepreneurs using a causational approach are expected to recognize failures in a later stage. Causal entrepreneurs are goal driven and focused on competitive analysis to predict an uncertain future and try to achieve pre-determined goals against high stakes (Sarasvathy, 2008). In

order to achieve those goals causal entrepreneurs can over-trust their data and despite negative changes in their environment stick to their plan or even worse increase their investment (Dew, Sarasvathy, Read, & Wiltbank, 2009b) which consequently postpones the moment of recognition.

Based on these findings the following hypotheses are formulated:
H3a: SMEs with a high emphasis on causation in their entrepreneurial approach recognize failures later than SMEs with low emphasis on causation.
H3b: SMEs with a high emphasis on effectuation in their entrepreneurial approach recognize failures earlier than SMEs with low emphasis on effectuation.

2.5   Performance

2.5.1   Causation in relation to performance

As mentioned in paragraph 2.1 causation can be linked to the 'school of planning' where planning and market research are used as input for a goal driven model. In contrast effectuation can be connected to the 'school of learning', whereby flexibility instead of planning is essential to be able to deal with an uncertain environment. Research on the effects of causal planned approaches and emergent effectual approaches on the performance of firms dates back to the `80s. In those years the 'planning' versus 'learning school' debate triggered several scholars to established relationships between planning/emergence and firm performance. One of those studies to the relationship between planning and performance was done by Miller and Cardinal (1994). They found that planning has a positive, strong and direct effect on firm performance. Within the last decade, Delmar and Shane (2003) confirmed this positive effects of planning on performance. They state that business plans help firm founders in making decisions, to turn abstract goals into operational steps and to balance resource supply and demand. However, they also noted that *"business planning may be a more effective tool during the start-up of a new business than during the maintenance of an established business "* (Delmar & Shane, 2003, p. 1181).

Along that same line, the research of Brinckmann, Grichnik and Kapsa (2010) showed that business planning has stronger effects on the performance of small established firms then on new firms. What is due to the influence of contingencies factors such as uncertainty, limited prior information, and an absence of business planning structures and procedures (Brinckmann, Grichnik, & Kapsa, 2010). Based on their findings Brinckmann et al. (2010) suggest that a concomitant and dynamic approach of planning, learning and doing is most beneficial for entrepreneurs. *" This approach combines both planning school and learning school based approaches. Rather than understanding entrepreneurship as a sequential process of planning followed by execution, this approach stresses parallel activities of planning and doing with an increased allocation of resources to the planning domain"* (Brinckmann, Grichnik, & Kapsa, 2010, p. 25). Furthermore, Gruber (2007) showed that *"the value received from planning varies systematically with the type of founding environment, the type of activities pursued in planning, and the effort devoted to specific activities"* (Gruber, 2007, p. 783)*.* Which indicates that

contingencies are important to explain, the conditions under which planning facilitate performance. Taken together, these results suggest that causation as a goal driven model sometimes have positive effects and sometimes have no effect on planning.

Based on these findings the following hypothesis is formulated:
H4a: Causation has a positive influence on the performance of SMEs.

2.5.2   Effectuation in relation to performance

Where causation can be linked to the 'school of planning', effectuation can be connected to the 'school of learning, whereby flexibility instead of planning is essential to be able to deal with an uncertain environment (Mintzberg, 1978). Empirical evidence, however limited, of effectuation on performance in SMEs has just begun to be gathered (Wiltbank, Read, Dew, & Sarasvathy, 2009) (Read, Song, & Smit, 2009). The proposed link between effectuation and performance is first noticed in Sarasvathy (1998)doctoral dissertation. In the subsequent years only a few studies tested effectuation empirically. The most important results came from Read et al. (2009)who examined years of previous research to perform a meta-analysis of effectual principles. They discovered a positive relationship between three of the five dimensions of Sarasvathy`s (2001a) effectuation model and firm performance. Using given means, partnerships, and levering contingencies were all positively associated with firm performance. Only affordable loss showed a negative relationship with firm performance and the control dimension was not measured since the data was not suitable for it. A long the same line, Wiltbank et al. (2009) found in their study to performance differences of angel investors *" empirical evidence in support of the arguments in the theory off effectuation, specifically, that efforts anchored on existing means, using the principles of affordable loss, pre-comitted partnerships, and leveraging surprise, can provide useful benefits under uncertainty"* (Wiltbank, Read, Dew, & Sarasvathy, 2009, p. 129).

Based on the empirical evidence of Read et al. (2009) and Wiltbank et al. (2009), there is a reason to believe that there is a relationship between effectuation and firm performance. Nevertheless, one meta-analysis, including the research of Wiltbank et al. (2009), is not sufficient enough to conclude that the link between effectuation and firm performance has been proven. By testing this relationship, this thesis can provide important findings in the development of the effectuation literature.

Based on these findings the following hypothesis is formulated:
H4b: Effectuation has a positive influence on the performance of SMEs.

According to Read et al. (2009) the affordable loss principle is the most consistent of all the effectual principles that have been put forward. Paragraph 2.4 shows that failure plays an important role in entrepreneurial learning and intimated to affect firm performance. Since effectual entrepreneurs tend to make more failures in contrast to causational entrepreneurs due to their use of low cost probes, experimentation and affordable loss (Brown & Eisenhardt, 1997)the consequential learning will also be higher (Cope, 2011). This because learning-by-doing leads to certain promising actions being repeated, due to their past successes. Once an entrepreneur finds something that works fine, and satisfies his

needs, he has learned to perform at a given level of success, and may not want to follow alternative paths with higher potential rewards and risks (Sitkin, 1992). Ultimately leading to a lock-in in their own pattern of action and the subsequent learning effect may not proceed towards a maximal payoff in performance. In relation to this thesis one would expect more causation oriented entrepreneurs to stick to their pattern in contrast to effectual oriented entrepreneurs.

Based on these findings the following hypotheses are formulated:
H5: The mediating role of failures in the relationship between causation and performance is negative.
H6: The mediating role of failures in the relationship between effectuation and performance is positive.

2.6   Causal model
From the theory can be derived that the entrepreneurial approaches of causation and effectuation influence failures SMEs make and affect the performance of the firm. A difference in failures between the entrepreneurial approaches of causation and effectuation can be expected in the number of failures a SME makes, the impact of those failures on the firm and the recognition time of a failure. The causal model in figure 3, is a synopsis of the assumptions of theory and shows the relationships between the research variables as described in the hypotheses.
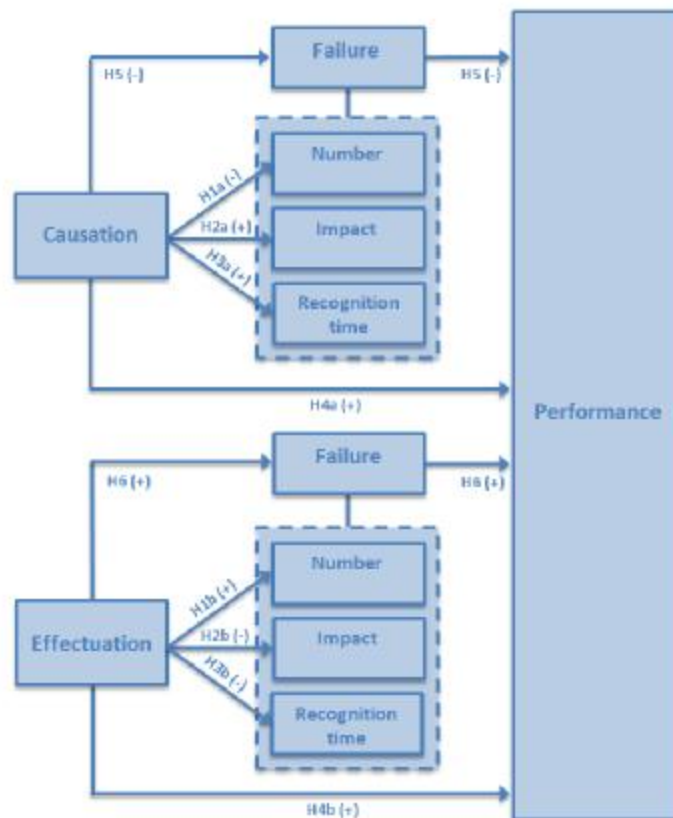
Figure 3 - Causal model

3 RESEARCH METHODOLOGY

After having highlighted the conceptual background of this thesis, the following chapter describes the research methodology which is used to answer the hypothesis. It describes how the data is gathered, processed and analyzed. In paragraph 3.1 the research approach is given, in paragraph 3.2 the research measures are described and analyzed with principal component analyses in order to come up with reliable and valid results and finally in paragraph 3.3 the sample and response rates are given.

3.1 Research approach

In order to investigate the relationships between the entrepreneurial approaches of causation and effectuation and failure and the relationships between causation and effectuation and performance, a survey research with a cross-sectional design has been applied. The research has an explorative purpose and followed a deductive approach. This research approach provides the opportunity to test the relationships from the causal model statistically, as to assess the strength and directions of these hypothesized relationships.

3.1.1 Focus group session

In order to measure the variables of this study correctly the literature was scanned for pre-existing scales of causation, effectuation, failure and performance. This approach is consistent with what Hyman, Lamb and Bulmer (2006) describe when they talk about the use of pre-existing survey questions. According to Hyman et al. (2006) the advantages of using pre-existing questions are that their usefulness already has been tested, it saves time and money for developing questions yourself and conceptual, methodological and maybe even measurement work which has been done after the publication of the existing questions helps to complement and update those questions.

After a thoroughly literature review, applicable scales were found for all the variables except failure. Since the literature lacks well tested scales to measure failure correctly, a focus group session with a panel of scholars and entrepreneurs was organized. The goal of the session was to bridge the gap between the theory and practice and to come up with valid questions for the survey. The panel consisted of two scholars, two highly experienced entrepreneurs, one starter and one behavioral expert. The panel was not informed about the topic of the session in advance to avoid biased results. During the sessions the panel was asked about their view on failure in entrepreneurship. This was done in order to define failure and to address the most important indicators of failure. The results of the focus group session were compared with the findings in the literature review and showed similarities with the theory of Cardon et al. (2011). They confirmed the indicators of failures as described in the causal model. Due to the similarities with the theory of Cardon et al. (2011), the questions about failure in the questionnaire were based on the indicators of this theory and supplemented with the most important indicators from the focus group session. In section 3.2, research measures, the indicators are explained in detail and tested for reliability.

3.1.2 Questionnaire

After the focus group session the questionnaire was constructed, translated to Dutch and tested in a pilot with four entrepreneurs. In this pilot the questionnaire was taken oral during an interview. This in order to get feedback and discuss the possibilities for improvement with the entrepreneurs. Based on the results of the pilot, the final questionnaire was drafted and put online. This final questionnaire consisted of 51 questions dived into five parts. Firstly, a part about the entrepreneurial approach which indicates to what extent the entrepreneur use causation and/ or effectuation. Secondly, a part about the number, impact and type of failures entrepreneurs make. The third and fourth part focused performance of the SME`s and finally the fifth part was about the personal and company details. The questionnaire consisted of mostly closed questions using a 5 and 6-point likert scale. A couple of open questions were added to identify personal and company characteristics. Most of the time a 5-point scale was used which is one of the most used Likert-scales in quantitative research (Field, 2009). However at some questions a 6-point scale is used to force the respondents to choose in favor of a concept in example in favor of causation or effectuation in the first 15 questions about the entrepreneurial approach. For one question, question 25, a 7-point scale is used to get a more specific answer about the revenue of the companies. The final questionnaire, in Dutch, is included in appendix 2.

3.2 Research measures

This section describes all the variables that are used in the hypotheses and how they are operationalized in the questionnaire. The constructs, scales and first order items that are used in this study are derived from literature and well tested.

3.2.1 Causation and Effectuation

In order to measure causation and effectuation correctly the literature was scanned for pre-existing scales which already measured causation and effectuation at dimensions level and attained a high reliability and validity for that. The scales that were used in this study are the scales of Brettel et al. (2011) and Wiltbank et al. (2009). The scale of Brettel et al. (2011) was used because of its high reliability and the use of multiple dimensions of causation and effectuation. The original scale of Brettel et al. (2011) can be found in appendix 4. However not all the items of this original scale were used due to the large amount of items each dimension contains. Therefore the two most applicable items per dimension were used in this study. These two items were selected during the focus group session and pre-tested by entrepreneurs. In total 16 items were selected. Hyman et al. (2006) states that this procedure is reasonable as long as you test this new scale for reliability and validity. The scale of Wiltbank et al. (2009) was used in order to complement the two missing dimensions, prediction and control, in Brettel et al. (2011) scale and because of their reliable and significant findings. Since this scale only focused on the dimensions of prediction and control, the whole scale, which consist of 14 items, was used. The original scale can be found in appendix 5. In total 30 items are selected and for each items the participants are asked to what extend they agree or disagree with the statement on a 6-point Likert-scale. Just as the original scale of Brettel et al. (2011), a 6-point Likert-scale was used to force a choice

by the respondents in favor of an entrepreneurial approach. However, in the original scale causation and effectuation were contrasted against each other, and in this scale they were not in order to measure the degree of causation and effectuation independently from each other.

After constructing this new scale their reliability and validity are calculated by the first quantitative tests. The reliability was assessed by calculating Cronbach`s Alpha and item-to-total correlations and their validity by principal component analyses. The results are summarized in table 2. As first a principal component analysis was conducted on the 15 items of causation with orthogonal rotation (varimax). The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis and is with a score of KMO = .671, which is well above the acceptable limit of .500 (Field, 2009). Barlett`s test of sphericity $\chi 2$ (91) = 316,601, p = < .001, indicates that correlations between items were sufficiently large for a principal component analysis. Finally the correlation matrix was inspected and showed some coefficients > .300. By meeting these criteria the second step, determine how many underlying components there are in the dataset, was performed. Using the Kaiser`s criterion, which suggest that all components with an eigenvalue of 1.0 or more should be retained in this study, 5 components explaining 63,07% of the variance were extracted for the 15 items of causation. Appendix 6 shows the factor loadings after rotation for each component. Factor loading below .45 are seen as poor loadings and therefore exclude from the table (Comrey &Lee`s, 1992). This resulted in deleting item Cau8b in the analyses. As a result of this the Cronbach`s alpha of causation increased to 0.75 which shows that this scale possesses a high ratability. According to Field (2009) each value of Cronbach`s alpha which lies above .7 indicates a reliable scale. The principal component analysis suggest that component 1 represents goals-orientation (α= 0.63) , component 2 competitive analysis (α= 0.69), component 3 prediction (α= 0.57), component 4 overcome the unexpected (α= 0.25) and component 5 expected returns (α= 0.50).

Secondly, a principal component analysis was conducted on the 15 items of effectuation with orthogonal rotation (varimax). The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis and is with a score of KMO = .634, above the acceptable limit. Barlett`s test of sphericity $\chi 2$ (91) = 252,660, p = < .001, indicated that correlations between items were sufficiently large for a principal component analysis. Finally the correlation matrix was inspected and showed some coefficients > .300. By meeting these criteria the second step, determine how many underlying components there are in the dataset, was performed. Using the Kaiser`s criterion, 5 components explaining 60,59% of the variance were extracted for the 15 items of causation. Appendix 6 shows the factor loadings after rotation of each component. Factor loading below .45 are seen as poor loadings and therefore exclude from the table (Comrey &Lee`s, 1992). This resulted in deleting item Eff6a in the analyses. As a result of this the Cronbach`s alpha of effectuation decreased from 0.63 to 0.62. The principal component analysis suggest that component 1 represents partnerships (α= 0.55) , component 2 control (α= 0.58), component 3 affordable loss (α= 0.74), component 4 means-orientation (α= 0.56) and component 5 overcome the unexpected (α= 0.25).

3.2.2 Failure

In order to measure failure correctly the literature was scanned for pre-existing scales. Despite a thoroughly search no directly applicable scales were found and therefore questioned needed to be constructed. In order to come up with reliable and valid questions, focus group sessions with experts were organized. As described in paragraph 3.1 the main goal of these sessions was to compare the findings of the literature review with the view of the experts and confirm the indicators of failure. Based on both findings survey questions were constructed.

As input for the focus group sessions the most important implications about entrepreneurial failure were used. As first, the literature address internal factors as most important reason for entrepreneurial failure instead of external factors (Ropega, 2011) (Zacharakis, Meyer, & DeCastro, 1999) (Theng & Boon, 1996). Secondly, differences in types of failures exists between entrepreneurs using causational and effectual strategies (Chandler, DeTienne, McKelvie, & Mumford, 2009) (Dew, Sarasvathy, Read, & Wiltbank, 2009b) (Wiltbank, Read, Dew, & Sarasvathy, 2009). And as third, giving one clear definition of failure is very difficult, since it does not exist in literature. In example in only the last two decades several terms have been used: failure defined as bankruptcy, decline, discontinuance or termination as result of fallen short of its goals (Ropega, 2011) (Watson & Everett, 1999). Based on these three main points the structure and questions for the focus group sessions were developed. During the focus group sessions the experts were asked about their view on failure and discussed the different questions. Many different opinions about what failure is were named but one main view was shared: failure is a loss of money, time, relationships and opportunities. Besides this broad but shared view, similarities were found on the indicators of failure. Most experts named impact as most important aspect of failure, since impact measures the effect of failure. According to the entrepreneurs the effect is more important than the size of failure as the literature stated. One can make big failures with small impact but they are more worried about small failures with big impact. Besides the impact of failure also the number of failure is important since it increases the possibility of failures with high impact. Lastly the entrepreneurs stated that besides a differences in recognition time, which is difficult to measures since most of the entrepreneurs find themselves accurate in the recognition of failures, solving time is as important as recognition time since it shows the ability of the entrepreneur to save money, time, relationships and opportunities.

The focus group sessions and the literature review showed a lot of similarities on the indicators of failures and resulted in valuable input for the construction of the survey questions. Based on both findings survey questions were constructed around the number, impact, recognition and solving time of failures. For the questions about number of failures the model of Cardon et al. (2011) was used in order to address different causes of internal and external failures. Since the focus group session showed that just asking for the amount of failures will not give a real representation of the situation, since it is probably a too direct question for the entrepreneur, six questions around possible causes and five questions about possible effects of failures were constructed. For both sets of questions a 5 point Likert-scale ranging from none - often was used. In order to come up with valid questions about the impact of failures six questions about the impact of failures on different aspects of the organization were asked

with a 5 point Likert-scale ranging from very low - very high. Furthermore, six statements about the different possibilities of the impact were formulated and based on the focus group sessions. The six statements were asked with a 6 point Likert-scale ranging from strongly disagree – strongly agree. For the questions about the recognition and solving time of failures five statement about five different types of failures were asked. These five statements were a selection of the previous questions and were asked with a 6 point Likert-scale ranging from strongly disagree – strongly agree. The last set of questions, presented in the questionnaire as question 19, were eight optional questions about the figures of failures the entrepreneurs made. Because most entrepreneurs skipped this questions and the answers that were given were not valid these questions were excluded from the data analysis.

After constructing the new questions the reliability was assessed by calculating Cronbach`s Alpha and item-to-total correlations and the validity of the questions by a principal component analysis. The results are summarized in table 2. The principal component analysis was conducted on the 27 items of failures with orthogonal rotation (varimax). The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis and is with a score of KMO = .825, which is well above the acceptable limit of .500 (Field, 2009). Barlett`s test of sphericity $\chi 2$ (496) = 1667,058, p = < .001, indicated that correlations between items were sufficiently large for a principal component analysis. Finally the correlation matrix was inspected and showed some coefficients > .300. An initial analysis was run to obtain eigenvalues for each component in the data. Seven components had eigenvalues over Kaiser`s criterion of 1 and explained 67,03% of the variance. The scree plot was slightly ambiguous and showed inflexions that would justify retaining 3 or 4 components. Given the sample size and the convergence of the scree 4 components explaining 55,40% of the variance were retained in the final analysis for the 27 items of failure. Appendix 6 shows the factor loadings after rotation and the Cronbach`s Alpha coefficients of each component. Factor loadings below .45 are seen as poor loadings and therefore exclude from the table (Comrey &Lee`s, 1992). The principal component analysis suggest that component 1 represents impact of failures (α= 0.83) , component 2 recognition time of failures (α= 0.86), component 3 internal failures (α= 0.74) and component 4 number of failures (α= 0.66).

3.2.3 Performance

In order to measure performance correctly the literature was scanned for existing scales. In most studies that were found, performance is measured based on growth or financial results (Read, Song, & Smit, 2009). However, dependent variables that represent firm performance vary greatly and virtually every one varies in the metrics used to collect the data, so finding one applicable scale is hard (Delmar, Davidsson, & Gartner, 2003). Looking at the scarce empirical data of effectuation studies on firm performance doesn't lead uniform measures. This is probably caused by convenience and related availability issues. The consequences is that it is harder to compare results across different studies. Therefore some scholars recommend using non-financial measures besides financial measures and include multiple dimensions (Sarasvathy, 2008) (Schwenk & Shrader, 1993). Therefore in this study four of the most used financial and one non-financial measures were used. As financial measures the turnover growth, profit growth, employment growth and market share growth were used and derived from Read et al. (2009) and Delmar et al. (2003). According to Delmar et al. (2003), the use of multiple

measures is advantageous since it provides an opportunity to use a measure optimized to the study's specific purposes while allowing comparisons with the results of previous studies using other growth measures. Furthermore it provides a more complete picture of any empirical relationship as well as it enables a way to test the robustness of any theoretical model to misspecifications in the dependent variable. The financial performance was measured with a 5 point Likert scale ranging from strong decrease (>20%) to strong increase (>20%). The reliability and validity of the financial performance construct was assessed by calculating Cronbach`s Alpha and conducting a principal component analysis. The results are summarized in table 2. According to Field (2009) the reliability and validity of the construct is high with an Alpha of 0.81 and factor loading between 0.75 and 0.90.

3.2.4 Innovation performance

As non-financial measure the innovation performance of the firm was used and adopted from Johannessen et al. (2001). The authors developed a well-tested scale that addresses six areas of innovative activity: new products, new services, new methods of production, opening new markets, new sources of supply and new ways of organizing. They found that innovation as newness represents a unidimensional construct, distinguished only by the degree of radicalness. Their constructs classifies innovations into new to the firm and new to the industry. Factor analysis on data from two field studies showed a good fit for both first order variables. Since this construct focus on the "output" variables of new technologies instead of the "technologies" it selves it was very useful and easily applicable for this study. The scale consist of nine items dived into two questions with two possible answers: yes or no. For the first question, six areas of innovation activity were presented and the respondents were asked if these innovation areas where new to their firm. For the second question the first three innovation areas were presented and the respondents were now asked if the activities were new to the industry. Since the scale was well tested no additional factor analysis was conducted. The scale can be found in appendix 7.

3.2.5 Control variables

The control variables used in this study were *experience,* measured in number of years of working experience, *CEO experience,* measured in number of years being CEO of a company, *number of start-ups,* measured in number of founded ventures, *company age,* measured in in years since inception, *number of FTE*, measured in numbers of Full Time Employees in 2012, *and uncertainty,* measured as multidimensional construct composed of state, effect and response uncertainty. Last mentioned constructed is adopted from McKelvie, Haynie and Gustavsson (2011) and composed into a six item construct. The last item about the launch method was excluded since it only focused on production companies. The new construct was tested on reliability and validity and is presented in table 2.

Second order variable	First order variable	Variance explained	KMO	Loadings	Deleted items	Reliability	Number of Items
Causation		63,07%	.671		Cau8b	**α = 0.75**	15
	Goals orientation			.47 - .85		α = 0.63	4
	Expected returns			.57 - .88		α = 0.50	2
	Competitive analysis			.45 - .91		α = 0.69	3
	Prediction			.55 - .77		α = 0.57	3
	Overcome the unexpected			.66 - .74		α = 0.25	2
Effectuation		60,59%	.634		Eff6a	**α = 0.62**	15
	Means orientation			.64 -.72		α = 0.56	3
	Affordable loss			.73 - .89		α = 0.74	2
	Partnerships			.45 - .71		α = 0.55	4
	Control			.62 - .79		α = 0.58	3
	Leveraging the unexpected			.59 - .77		α = 0.25	2
Failure		55,40%	.825		Fail16F	**α = 0.81**	27
	Impact of failures			.48 - .76		α = 0.83	11
	Number of failures			.47 -. 61		α = 0.66	3
	Internal failures			.50 - .73		α = 0.74	2
	Recognition time of failures			.59 - .79		α = 0.86	5
	Solving time of failures			.54 - .79		α = 0.83	5
Performance		64,39%	.732		-	**α = 0.63**	4
Uncertainty		60,29%	.736		-	**α = 0.69**	6
	Response uncertainty			.63 - .84		α = 0.63	4
	State uncertainty			.47 - .80		α = 0.69	2

Table 2 - Summarizing results principal component analyses and Cronbach`s alphas

3.3   Sample and response

The participants who were asked to participate in this research were 600 entrepreneurs of SMEs who completed a management development program of TSM, called Ondernemend Directievoeren. This management development program helps entrepreneurs tackling the problems and challenges of their growing enterprises. State of the art knowledge and skills training is facilitated to provide the entrepreneurs he necessary experiences. During the program the entrepreneurs develop a written business plan including a strategy for the upcoming years. Since the start of the program, 25 years ago, about 600 entrepreneurs successfully followed this program. However, some of them quitted or changed from. Therefore, 379 entrepreneurs remain useful. Those entrepreneurs are CEO`s of SMEs that meet the requirements of the definition of SMEs used for this thesis.

SMEs are chosen because they are most important for the economy, "*in the European Union (EU), more than 99% of the existing firms are SME; they stand for two-thirds of all employment possibilities and account for 60% of value added*" (Franco & Haase, 2010, p. 504). Furthermore, because much research has been done about the success and growth factors of SMEs but that "*in contrast, little has been done*

to examine factors of poor performance and failure of established SME" (Franco & Haase, 2010, p. 504). And because I have access to a database of my employer TSM Business School (TSM) which contains 600 entrepreneurs of SMEs.

The sampling method, used to select entrepreneurs for the research, is the Total Design Method (TDM). This TDM is developed by Don Dillman (1978) and is regarded as the standard for online survey's in social science. It has been successful in securing high response rates from general and special samples. The general assumption is that the higher the response rate the lower the potential of non-response error and therefore the better the survey.

3.3.1   Data collection

In order to collect the data in a structured way, an online data collection tool, surveymonkey, was used. After finalizing the questionnaire, it was put online and the entrepreneurs were invited to participate by a personalized email through surveymonkey. This invitation email (in Dutch) is attached in appendix 3. In this email a short introduction about the topic and its importance for theory and practice were given. With a provided internet link in the email the entrepreneur was directed to the questionnaire. The invitation for the online survey was sent on the 8th of August. Table 3 describes the specific steps that were employed sequentially.

Date	How	Response	Response cumulative
Thursday 8th of August	First personalized e-mail invitation with link to survey from surveymonkey account.	28	28
Tuesday 27th of August	First personalized e-mail invitation with link to survey from personal TSM account.	19	47
Last week of September	Checking and refreshing e-mail addresses of the database: 73 new e-mail addresses were found.	-	-
Tuesday 1st of October	First personalized e-mail invitation to new addresses from personal TSM account.	16	63
	Second personalized e-mail invitation with slight changes in the text was sent from personal TSM account to the other addresses.	20	83
Thursday 17th of October	Second personalized e-mail invitation was sent to new addresses from personal TSM account.	11	94
	Third personalized e-mail invitation was sent from personal TSM account to the other addresses.	5	99
First three weeks of November	Personal phone calls to latest participants of the program (2000 and onwards).	34	133

Table 3 - Steps in data collection

Of the 379 e-email addresses, 39 emails addresses bounced and 28 respondents are retired which left 312 clear addresses. The first email with the invitation to participate in the study produced a result of just 28 completed surveys. The low response rate can be caused by the use of Surveymonkey, which automatically sent the survey with their name in the address line. For the first reminder I used my TSM account and resulted in an additional 19 completed surveys. Despite the use of my own account the response remained low and I decided to check the email addresses of the oldest invites (10-25 years).

This resulted in 73 new addresses and additional 16 responses. To the other addresses a second reminder was sent with some slight changes in the text. This resulted in another 20 responses.   After sending a second reminder to the 73 new email addresses and a third and last reminder to the other group, 16 additional responses were collected. The last 34 responses were collected after phone calls.

The long time span of the data collection was mainly caused by the difficulty to convince the entrepreneurs to participate in this research. All entrepreneurs who were invited are busy most of the time and will probably only participate when there is something in for them, despite their good relation with TSM Business School. Therefore a clear explanation of the added value in the email invitation was very important. Furthermore the personal attention, in the form of a phone call and a more personalized email, proved to be successful. Finally, the start of the data collection was in the middle of the summer holidays and kept together with the use of the automatic generated email of surveymonkey the first response pretty low.

In total 91 of the 133 collected surveys were completely filled in. Of the 41 incomplete surveys, 14 surveys can be used in the data analyses because the answered questions about 2 or more variables. After excluding the outliers in my data set (companies with > 900 FTE) 101 cases remained. This is a response rate of 32,4%. An overview of the response rates are presented in table 4.

Type of response	Responses	Response rate
Total responses	133	43%
Complete responses	91	29%
Incomplete responses	42	14%
Incomplete but useful responses	14	4,5%
Completes but unuseful responses	4 / 105	3,8%
Useful response for data analyses	101 / 312	32,4%

Table 4 – Response rates

4 RESULTS

This chapter contains the actual analysis of the collected data and provides the answers to sub-questions as well as the analysis of the hypotheses. This chapter starts, in paragraph 4.1, with the correlation analysis of the variables of the main concepts included in this study followed by regression analysis of all the hypotheses in paragraph 4.2. The sub paragraphs of section 4.2 answer the hypothesized relationships on concept level and show subsequent relations on variable level. In order to facilitate reading, this paragraph is structured in the same way as the theoretical framework in chapter 2.

4.1 Correlation analysis

A bivariate correlation analysis of all the key and control variables in this study was performed. Table 5 presents the Pearson`s correlation-coefficients of the 12 second order variables (causation, effectuation, failures, financial performance, incremental innovation, radical innovation, uncertainty, experience, CEO experience, number of start-ups, company age and Amount of FTE) and the 4 first order variables of failures (Impact of failures, Recognition time of failures and Number of failures). This Pearson`s coefficient represents the effect size of a relationship between two variables and tells what degree of relationship between two variables can be represented by a straight line. The value of Pearson`s correlation coefficient lies between -1 and 1. A correlation coefficient of (-)1 represents a perfect linear relationship between two variables whereas a correlation coefficient of 0 represents a non-linear relationship or no relationship between two variables (Field, 2009). It should be remarked that in this study a two-tailed test for the correlation analysis was used. According to Field (2009) this is recommended when one cannot predict the nature of the relationship between variables.

In order to investigated the role of failure in the relation between the entrepreneurial approaches of causation, effectuation and performance the correlation table, table 5, was investigated on significant relations. With a correlation coefficient of .349** and a significance value of .01 expected return has the strongest positive correlation with performance. This means that an entrepreneurial approach with a strong focus on expected return leads to higher performance. Though it is the strongest correlation, Field (2009) classifies a correlation of .349 as a weak correlation. According to Field (2009) a correlation >.7 can be considered a strong. Also control is positively correlated with performance with a correlation coefficient of .222* and a significance level of .05. This implies that the higher the focus is on control in an entrepreneurial approach the higher the performance will be. Looking to the other performance indicator, innovation, weak correlations exist between the independent variables causation (.217*) and incremental innovation, which means that the higher the amount of causation in entrepreneurial approaches the higher the incremental innovation. Also the first order variables goals orientation (.233*) and competition (.259*) show a weak positive correlation with incremental innovation. This makes sense since one would expect that causation and it dimensions lead to gradual changes and innovations whereas effectuation and its dimensions lead to more emergent and radical changes and innovations.

Looking at significant correlations with the dependent variable failure, only dimensions of the effectuation show weak significant correlations with the second order variable failure. Affordable loss and leveraging the unexpected show both a negative and weak correlation with failure. They both have a correlation coefficient of - .226*, which indicates that the higher the failures, the lower the amount of affordable loss and leveraging contingencies in the entrepreneurial approaches of SMEs. This is remarkable since one would expect, on basis of the literature review, a positive correlation with effectuation and a negative correlation with failure. Also the control variable number of FTE (.212*) has a significant correlation with the second order variable failure. This positive correlation makes sense since an increase in number of people working in an organization automatically increases the possibility of making failures caused by human action. In line with the significant findings of the second order variable failure also correlations with the first order variable impact of failure are negative. Affordable loss (-.206*)and leveraging the unexpected(-.206*) show both a weak negative correlation with impact of failure. The only positive significant correlation exists between expected return(.241*) and recognition time of failures. This indicates that an increase in amount of expected return results in a longer recognition time of failures.

Variable	(Items)	x̄	σ	N	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
1. Causation	(14)	2.59	0.39	101	1.000															
2. Effectuation	(14)	2.52	0.36	101	.400**	1.000														
3. Failures (2nd order)	(32)	2.05	0.41	101	.066	-.095	1.000													
4. Impact of failures	(13)	1.64	0.58	101	-.059	-.119	.828**	1.000												
5. Recognition time of failures	(9)	2.95	0.59	90	.183	.072	.024	-.390**	1.000											
6. Internal Failures	(5)	1.96	0.67	101	.062	-.103	.728**	.642**	-.321**	1.000										
7. Number of failures	(5)	1.87	0.61	101	-.019	-.043	.605**	.600**	-.324**	.470**	1.000									
8. Financial Performance	(4)	2.14	0.82	90	.167	-.034	-.019	-.035	.087	-.034	-.096	1.000								
9. Incremental innovation	(6)	2.02	1.03	87	.217*	.036	.173	.188	-.220*	.322**	.195	.002	1.000							
10. Radical innovation	(3)	1.85	1.24	87	.188	1.72	.134	.087	-.033	.083	.234*	.071	.521**	1.000						
11. Uncertainty	(6)	1.56	0.72	87	-.141	-.103	.086	.070	-.135	.196	.162	-.199	.223*	.160	1.000					
12. Experience	(1)	2.64	0.84	87	-.008	.233*	-.127	-.063	.038	-.150	-.215*	-.206	-.053	.076	.055	1.000				
13. Start-ups	(1)	1.17	0.98	87	.088	.152	-.055	-.030	-.045	-.026	-.021	.179	.027	.053	-.115	.104	1.000			
14. CEO Experience	(1)	1.43	0.80	87	.156	.235*	-.099	-.052	.072	-.084	-.266*	.142	-.087	-.101	.036	.524**	.306**	1.000		
15. Company Age	(1)	1.77	1.16	87	.016	.018	-.158	-.062	-.214*	-.030	-.014	-.069	-.002	.009	.129	-.038	-.067	-.044	1.000	
16. Amount of FTE	(1)	1.28	1.41	90	.085	.058	.212*	.155	-.065	.275**	.200	-.084	.223*	.187	.195	-.070	-.003	-.243*	.105	1.000

Table 5 - Pearson correlation analysis. *Note : N = number of cases; x̄ = mean; σ = standard deviation; ** Correlation is significant at the .01 level; * Correlation is significant at the .05 level.*

4.2 Regression analyses

After the correlation analysis it is time to compute the actual regression analyses. In order to generalize the findings of the regression analyses the underlying assumptions have to be met. Field (2009) named nine assumptions which must be fulfilled in order to perform a regression analysis. All nine assumptions are met in this study and therefore the method of regressions analysis can be used.

To test the hypotheses and ultimately explain the role of failure (mediator) in the relationship between the entrepreneurial approaches of causation and effectuation (IV`s) and performance (DV) three steps are pursued. The first step is to test the direct effect of the independent variables causation and effectuation on the dependent variable performance. Secondly, the direct effect of causation and effectuation on failure will be tested. In addition the direct effects of causation and effectuation on the sub factors of failures are tested. The third step will test if failure (mediator) affects performance (DV). When all three steps show significant results and the effect of causation or effectuation (IV`s) on performance shrinks upon the addition of failure the mediating role of failure can be explained.

4.2.1 Causation and Effectuation in relation to performance

In order to perform the first step, multiple regression analyses were performed on the dependent variable performance. The results of these analyses are shown in table 6. In model 1 only the control variables are taken into consideration while in model 2 and 3 the first and second order variables of causation and effectuation are included as independent variables. In the first three models, financial performance (DV) is predicted on basis of causation, effectuation and their first order variables (IV`s). Looking at the control variables in model 1, experience (B= -.366, p <.05) and CEO experience (B= .332, p <.05) does seem to have an impact on financial performance. It is generally assumed that as long as the significance value is less than .05 the associated variables make a significant contribution in predicting the outcome (Field, 2009). The regression coefficient for CEO experience is .332 and indicates that if CEO experience increase by one unit the financial performance increase by .332 units. The regression coefficient for Experience is -.366 which indicate that an increase of one unit of experience results in a decrease of the financial performance by .366 units. The negative influence of experience on financial performance is remarkable since one would expect, on basis of the literature review, a positive effect of experience on financial performance. Also because of the positive effect of CEO experience on financial performance. In order to exclude the possibility of multicollinearity the VIF (variance inflation factor) and tolerance factor are calculated. With VIF values of 1,395 for experience and 1,635 for CEO experience and a tolerance factor far above 0.2 for both , .717 for experience and .612 for CEO experience, multicollinearity can be excluded from this this model. The correlation coefficient squared of model 1 shows that just 17,7% of the variance in organizational performance can be explained by the control variables. This implies that not the control variables alone account for the variation in the outcome variable financial performance.

In model 2 the second order variables causation and effectuation are added to the model and show that neither causation (B= .271, p = .244) nor effectuation (B= -.189, p = .471) has a significant influence on financial performance. Furthermore, the correlation coefficient squared shows that 19,3% of the

variance in organizational performance can be explained by causation, effectuation and the control variables. This is just 1,6% more than in model 1. In order to improve the prediction of financial performance, the first order variables of causation and effectuation are taken together with the control variables and are shown in model 3. This resulted in an increase of the explained variance of organizational performance from 17,7% to 32,5%. With the inclusion of the first order variables, two significant relations appear. The control variable experience (B= -.366, p <.05) remains significant and has a negative influence on financial performance while the first order variable expected return (B= .498, P < 0.5), shows a strong positive relation with financial performance. The F-ratio is significant at the .01 level, indicating an overall goodness of fit.

After regressing causation, effectuation and their first order variables on financial performance, they were regressed on incremental and radical innovation performance. The results, in model 2, show that causation (B= .694 , P < 0.5) and uncertainty (B= .360 , P < 0.5) have a positive influence on incremental innovation. The model accounted for 15,6% of the explained variability in incremental innovation. This is relatively small and indicates that not only causation, effectuation and the control variables account for the variation in incremental innovation. This is confirmed by the F-ratio of model 2, which is not significant at all. Also when the first order variables of causation and effectuation where added to the model with the control variables, in model 3, the explained variance remains low with 21,4%. Reason for this could be that not all the elements of causation and effectuation are included in the analysis due to the results of the factor analyses. This topic will be discussed in more detail in chapter 5.

	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Dependent variable	Financial performance	Financial performance	Financial performance	Incremental Innovation	Incremental Innovation	Incremental Innovation	Radical Innovation	Radical Innovation	Radical Innovation
Uncertainty	-.206 (.088)	-.191 (.120)	-.155 (.226)	.297 (.065)	.360*	.322 (.068)	.256 (.186)	.343 (.075)	.308 (.124)
Experience	-.366*	-.336**	-.353**	-.038 (.810)	.013 (.933)	-.043 (.803)	.252 (.184)	.262 (.168)	.194 (.323)
Start-ups	.078 (.388)	.083 (.361)	.056 (.547)	.073 (.544)	.076 (.519)	.117 (.358)	.142 (.329)	.132 (.357)	.152 (.295)
CEO Experience	.332*	.308*	.244 (.092)	-.077 (.660)	-.164 (.353)	-.268 (.175)	-.309 (.148)	-.421 (.051)	-.613**
Company Age	-.031 (.670)	-.031 (.669)	-.060 (.420)	-.041 (.673)	-.047 (.623)	-.029 (.776)	-.019 (.867)	-.031 (.786)	-.015 (.898)
Amount of FTE	.027 (.661)	.020 (.756)	.026 (.696)	.125 (.135)	-.096 (.249)	.077 (.400)	.109 (.280)	.070 (.483)	.061 (.555)
Causation		.271 (.244)			.694*			.601 (.100)	
Effectuation		-.189 (.471)			-.111 (.743)			.394 (.338)	
Goals orientation			-.069 (.737)			.519 (.070)			.342 (.292)
Competition			.045 (.743)			.223 (.233)			.334 (.120)
Expected Return			.498*			.008 (.692)			.247 (.124)
Prediction			-.234 (.171)			-.092 (.978)			-.412 (.429)
Means orientation			.009 (.954)			.206 (.325)			.400 (.096)
Partnerships			-.076(.679)			-.154 (.539)			.121 (.673)
Affordable Loss			-.089 (.470)			-.111 (.512)			-.243 (.209)
Control			.252 (.127)			-.001 (.996)			.370 (.151)
N	101	101	101	101	101	101	101	101	101
R^2	.177	.193	.325	.093	.156	.214	.086	.150	.290

Table 6 - Regression models performance. *Note: ** P< .01; *P<.05, () = non-significant P-value.*

4.2.2 Causation and Effectuation in relation to failure

In order to determine how causation and effectuation are related to failure, and answer the first sub question of this thesis, multiple linear regression analyses are executed. Table 7 shows the results. In the first model the control variables were regressed on failure and showed no significant effects. In the second model, causation and effectuation were added to the control variables but also without significant results. Causation (B= .129, ns) has a positive non-significant and effectuation (B= -.164, ns) has a negative non-significant influence on failure. This is somehow surprising since the opposite directions were expected according the literature findings. However, when the first order variables of causation and effectuation was taken as independent variables and regressed on the main construct of failure significant results occurred. Model 3 shows that affordable loss (B= -.168, P <0.1) significantly

affects failure. Model 3 accounted for 32.5% of the explained variability in failure. Despite the finer level of granularity and the higher explained variance, the direction of the relation between affordable loss, as a dimension of effectuation, and failure remains negative. In contrast to the effectuation dimensions none of the causation dimensions has significant influence on failure. In order to explain the relations between causation and effectuation and failure more precise additional regression analyses are performed in the subsequent paragraph's where causation and effectuation as well as their dimensions were taken as independent variables and regressed on the dimensions of failure.

	Model 1	Model 2	Model 3
Dependent variable	Failures (2nd order)	Failures (2nd order)	Failures (2nd order)
Uncertainty	.033 (.530)	.035 (526)	.051 (.380)
Experience	-.055 (.293)	-.047 (.387)	-.066 (.242)
Start-ups	-.019 (.634)	-.017 (.670)	-.001 (.975)
CEO Experience	.012 (.837)	.009 (.880)	-.027 (.679)
Company Age	-.059 (.070)	-.059 (.074)	-.044 (.190)
Amount of FTE	.053 (.059)	.052 (.070)	.053 (.082)
Causation		.058 (.579)	
Effectuation		-.067 (.568)	
Goals orientation			.015 (.875)
Competition			.007 (.911)
Expected Return			.101 (.191)
Prediction			-.016 (.857)
Means orientation			.136 (.051)
Partnerships			-.024 (.777)
Affordable Loss			-.168**
Control			.012 (.871)
N	101	101	101
R^2	.100	.106	.325

Table 7 - Regression models failures (2nd order variable). *Note: ** P< .01; *P<.05, () = non-significant P-value.*

4.2.3 Causation and Effectuation in relation to number of failures

The results in table 8 show that the main constructs of causation (B= -.010, ns) and effectuation (B= .088, ns) do have the expected directions but do not significantly relate with number of failures. Looking

at a finer level of granularity in model 3, the first order variables of causation and effectuation show some significant results in relation to number of failures. Means orientation (B= .295, P <0.5) and affordable loss (B= -.270, P <0.1) are significantly related to number of failures and explain together with all the first order variables and control variables 32.5% of the variance in number of failures. The F-ratio is significant at the .01 level, indicating an overall goodness of fit. Despite the theoretical expectations of the positive influence of effectuation on number of failures only means orientation is positively related to number of failures.

Since none of the causation dimensions showed significant relations with number of failures and the effectuation dimensions show positive and negative relations with number of failures a final step was performed. The combined models of Brettel et al. (2012) and Wiltbank et al. (2009) are taken individually and regressed on number of failures. First the Brettel et al. (2012) model, which represents questions 1-8 in the questionnaire, was taken. The results in model 6 of table 8, show differences in comparison to the above mentioned findings of the combined models. The main constructs of Brettel et al. (2012), in table 4, show the same non-significant effects on the number of failures, a negative effect for causation (B= -.097, ns) and a positive effect for effectuation (B= .190, ns). But when the first order variables of Brettel et al. (2012), in model 6, are regressed on the number of failures significant changes occur. Goals orientation (B= -.234, P <0.5) becomes significant related to number of failures. Means orientation (B= .262, P <0.1) and affordable loss (B= -.264, P <0.1) affect number of failures at a significance level of .01. And as third, partnerships (B=.191, P <0.5) shows to have positive effect on number of failures. Finally, a negative relation is found between the control variable CEO experience (B= -.265, P <0.5) and number of failures. This can easily be explained by the fact that the experienced entrepreneurs tend to make less failures than inexperienced entrepreneurs but on the other hand, do experience entrepreneurs, according to the literature, use more effectuation than causation and they should make more failures than inexperienced entrepreneurs. The correlation coefficient squared of model 6 shows that 35,1% of the variance in number of failures can be explained by the first order variables of the Brettel et al. (2012) model and the control variables. Again, the F-ratio is significant at the .01 level, indicating that there is less than a 1% chance that the same values would arise if there was no real relationship between independent and dependent variables.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dependent variable	Number of failures	Number of failures	Number of failures	Number of failures	Number of failures	Number of failures
Uncertainty	.146 (.128)	.151 (.127)	.178 (.072)	.151 (.120)	.152 (.124)	.159 (.079)
Experience	-.090 (.337)	-.096 (.321)	-.139 (.152)	-.112 (.241)	-.086 (.369)	-.144 (.108)
Start-ups	.044 (.539)	.042 (.567)	.031 (.666)	.049 (.501)	.045 (.548)	.068 (.322)
CEO Experience	-.160 (.132)	-.165 (.133)	-.218 (.052)	-.165 (.132)	-.165 (.126)	-.265*
Company Age	-.031 (.590)	-.032 (.582)	-.014 (.810)	-.037 (.519)	-.032 (.582)	-.017 (.762)
Amount of FTE	.056 (.261)	.054 (.290)	.055 (.287)	.055 (.283)	.053 (.294)	.062 (.183)
Causation		-.010 (.959)				
Effectuation		.088 (.674)				
Goals orientation			-.178 (.265)			
Competition			.038 (.720)			
Expected Return			.255 (.055)			
Prediction			-.123 (.422)			
Means orientation			.295*			
Partnerships			.000 (.999)			
Affordable Loss			-.270**			
Control			.166 (.192)			
Causation – Brettel (B)				-.097 (.530)		
Effectuation– Brettel (B)				.190 (.212)		
Causation – Wiltbank (W)					.065 (.683)	
Effectuation–Wiltbank (W)					-.001 (.996)	
Goals orientation (B)						-.234*
Competition (B)						.082 (.225)
Expected Return (B)						-.093 (.517)
Means orientation (B)						.262**
Partnerships (B)						.191*
Affordable Loss (B)						-.264**
N	101	101	101	101	101	101
R^2	.132	.134	.325	.150	.134	.351

Table 8 - Regression models number of failures (1nd order variable). *Note: ** P< .01; *P<.05, () = non-significant P-value.*

4.2.4 Causation and Effectuation in relation to impact of failures

In table 9 regression analyses are performed on the first order variable impact of failures. The results in in model 2 show that the main constructs of causation (B= -.070, ns) and effectuation (B= -.124, ns) are negatively and non-significantly related to impact of failures. However at dimension level one significant result can be reported, as can be seen in model 3. Affordable loss (B= -.287, P <0.5) has a negative significant influence on impact of failures when the effectuation dimensions together with the control variables are regressed on impact of failures. This means that when the amount of affordable loss increases with one unite the impact decreases with .287 units. The model explains 17.9% of the variance in impact of failures. The F-ratio is significant at the .05 level, indicating an overall goodness of fit. In order to find more significant relations between the dimensions of causation and effectuation and impact of failures, the combined models of Brettel et al. (2012) and Wiltbank et al. (2009) were taken individually and regressed on impact of failures. The Brettel et al. (2012) model shows, in comparison to the above mentioned results, different effects when the main constructs causation and effectuation are taken as independent variables and are regressed on the dependent variable impact of failures. Causation (B= -.155, ns) still has a negative non-significant influence on impact of failures but effectuation (B= .076, ns) now has a positive non-significant influence on impact of failures. When the dimensions of causation and effectuation are taken together with the control variables as independent variables and their influence on impact of failures is tested, as can be seen in model 6, partnerships (B= .177, P<.05) and affordable loss (B= -.238, P<.01) have significant influence on impact on failures. Model 6 explains just 21.3% of the variance in impact of failures. The F-ratio is with a P-value of .122 not significant. This means that it is not certain that there is a relationship between the independent variables in model 6 and the dependent variable impact of failures.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dependent variable	Impact of failures	Impact of failures	Impact of failures	Impact of failures	Impact of failures	Impact of failures
Uncertainty	.038 (.680)	.023 (.812)	.032 (.748)	.030 (.748)	.019 (.838)	.041 (.650)
Experience	-.049 (.590)	-.045 (.633)	-.049 (.620)	-.064 (.493)	-.035 (.704)	-.092 (.311)
Start-ups	-.019 (.784)	-.016 (.823)	.011 (.875)	-.016 (.818)	-.004 (.954)	.019 (.781)
CEO Experience	.022 (.828)	.041 (.698)	-.051 (.648)	.039 (.715)	.028 (.785)	-.064 (.547)
Company Age	-.045 (.421)	-.043 (.450)	.003 (.964)	-.048 (.394)	-.049 (.382)	-.007 (.893)
Amount of FTE	.070 (.151)	.076 (.124)	.081 (.123)	.076 (.126)	.072 (.145)	.073 (.123)
Causation		-.070 (.696)				
Effectuation		-.124 (.543)				
Goals orientation			.078 (.628)			
Competition			.022 (.838)			
Expected Return			.144 (.284)			
Prediction			-.180 (.250)			
Means orientation			.124 (.299)			
Partnerships			.081 (.573)			
Affordable Loss			-.287**			
Control			-.061 (.635)			
Causation – Brettel (B)				-.155 (.305)		
Effectuation– Brettel (B)				.076 (.608)		
Causation – Wiltbank (W)					.025 (.869)	
Effectuation–Wiltbank (W)					-.225 (.226)	
Goals orientation (B)						-.038 (.728)
Competition (B)						.003 (.964)
Expected Return (B)						-.152 (.306)
Means orientation (B)						.153 (.091)
Partnerships (B)						.177*
Affordable Loss (B)						-.238**
N	101	101	101	101	101	101
R^2	.041	.051	.179	.055	.059	.213

Table 9 - Regression models impact of failures (1nd order variable). *Note: ** P< .01; *P<.05, () = non-significant P-value.*

4.2.5 Causation and Effectuation in relation to recognition time of failures

In table 10 regression analyses are performed on the first order variable recognition time of failures. The results in in model 2 show, as assumed in the theoretical framework, that organizations with causation approaches need more recognition time than organizations with an effectuation approach but that these findings lack significance. When the first order variables of causation and effectuation together with the control variables are regressed on recognition time of failures, as can be seen in model 3, one significant relation occurs. Company age (B= -.140, P<.05) has a negative influence on recognition time of failures. This indicates that the older a company becomes, the longer it takes before failures get recognized. The model accounts for 17% of the variability in recognition time of failures. But again, the F-ratio is not significant at all, which means that the significant findings could be due to chance.

In order to find significant results, the combined models of Brettel et al. (2012) and Wiltbank et al. (2009) were taken individually and regressed on recognition time of failures. Model 4 of table 14, show no differences in comparison to the combined models of Wiltbank et al. (2009) and Brettel et al. (2012). Causation still has a positive non-significant effect and effectuation a negative non-significant effect on recognition time of failures. Also when the first order variables of the Brettel et al. (2012) model and the control variables are regressed on recognition time of failures, no additional significant effects are found. Company age(B= -.144, P<.05) remains significant at the level of .05. But due to a lack of significance of the F-ratio, the relationship between the set of independent variables in model 6 and the dependent variable recognition time of failures cannot be proven.

4.2.6 Causation and Effectuation in relation to internal failures

As a result of the factor analysis a fourth component of failure was extracted, namely internal failures. In table 11 the results of the regression analyses on this first order variable are shown. The results show that the control variable amount of FTE has a positive significant relationship with internal failures in all the six models. This makes sense in the way that and increase in employees leads to an increase of the possibility of making mistakes inside the organization. In model 1, solely the control variables are regressed on internal failures and explain 13,9% of the variance in internal failures. Although amount of FTE (B= .129, P <0.5) is significantly related to internal failures the F-ratio is not significant with a P-value of .057. This non-significant F-value holds also for the other models except model 6. In model 6, the first order variables of the model of Brettel et al. (2012) is taken together with the control variables and are regressed on internal failures. The results show that besides the significant relation between amount of FTE (B= .120, P <0.5) and internal failures also affordable loss (B= -.227, P <0.5) is significantly related to internal failures. This means that an increase of affordable loss in the entrepreneurial approach of an SME lead to a decrease of internal failures. Model 6 explains 23% of the variance in internal failures and shows with a significant F-ratio, at the .05 level, that a relationship between this set of independent variables and internal failures exists.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dependent variable	Recognition time of failures	Recognition time of failures	Recognition time of failures	Recognition time of failures	Recognition time of failures	Recognition time of failures
Uncertainty	-.095 (.296)	-.069 (.453)	-.053 (.582)	-.080 (.384)	-.070 (.452)	-.065 (.469)
Experience	-.002 (.984)	.015 (.872)	-.001 (.992)	.009 (.924)	.006 (.943)	.027 (.761)
Start-ups	-.059 (.391)	-.059 (.392)	-.049 (.488)	.061 (.375)	-.061 (.379)	-.065 (.334)
CEO Experience	.066 (.508)	.031 (.759)	.099 (.363)	.039 (.705)	.049. (627)	.099 (.342)
Company Age	-.099 (.073)	-.102 (.066)	-.140*	-.098 (.080)	-.102 (.067)	-.144*
Amount of FTE	-.014 (.772)	-.026 (.591)	-.024 (.636)	.024 (.617)	-.022 (.643)	-.013 (.778)
Causation		.258 (.142)				
Effectuation		-.006 (.976)				
Goals orientation			-.042 (.787)			
Competition			-.002 (.986)			
Expected Return			-.019 (.882)			
Prediction			.282 (.065)			
Means orientation			.048 (.680)			
Partnerships			-.129 (.354)			
Affordable Loss			.084 (.368)			
Control			.018 (.885)			
Causation – Brettel (B)				.181 (.221)		
Effectuation– Brettel (B)				-.014 (.922)		
Causation – Wiltbank (W)					.190 (.206)	
Effectuation–Wiltbank (W)					.043 (.810)	
Goals orientation (B)						-.084 (.437)
Competition (B)						.070 (.287)
Expected Return (B)						.272 (.064)
Means orientation (B)						-.015 (.865)
Partnerships (B)						-.081 (.310)
Affordable Loss (B)						.071 (.412)
N	101	101	101	101	101	101
R^2	.073	.102	.170	.091	.096	.187

Table 10 - Regression models recognition time of failures (1nd order variable). *Note: ** P< .01; *P<.05, () = non-significant P-value.*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dependent variable	Internal failures	Internal failures	Internal failures	Internal failures	Internal failures	Internal failures
Uncertainty	.140 (.151)	.138 (.170)	.161 (.146)	.142 (.156)	.129 (.198)	.164 (.107)
Experience	-.139 (.148)	-.121 (.224)	-.166 (.125)	-.141 (.154)	-.121 (.214)	-.168 (.095)
Start-ups	-.011 (.811)	-.006 (.935)	.018 (.817)	-.011 (.887)	.004 (.954)	.046 (.548)
CEO Experience	.060 (.577)	.060 (.587)	.003 (.979)	.057 (.610)	.060 (.581)	-.026 (.821)
Company Age	-.047 (.427)	-.045 (.446)	-.022 (.735)	-.048 (.428)	-.053 (.378)	-.006 (.919)
Amount of FTE	.129*	.130*	.117*	.128*	.128*	.120*
Causation		.096 (.615)				
Effectuation		-.182 (.396)				
Goals orientation			.139 (.436)			
Competition			-.052 (.660)			
Expected Return			.070 (.633)			
Prediction			-.026 (.880)			
Means orientation			.168 (.203)			
Partnerships			-.137 (.387)			
Affordable Loss			-.210 (.051)			
Control			.042 (.767)			
Causation – Brettel (B)				.002 (.990)		
Effectuation– Brettel (B)				.024 (.879)		
Causation – Wiltbank (W)					.097 (.546)	
Effectuation–Wiltbank (W)					-.228 (.245)	
Goals orientation (B)						.146 (.236)
Competition (B)						-.078 (.295)
Expected Return (B)						-.003 (.986)
Means orientation (B)						.173 (.084)
Partnerships (B)						.035 (.696)
Affordable Loss (B)						-.227*
N	101	101	101	101	101	101
R^2	.139	.147	.207	.139	.154	.230

Table 11 - Regression models Internal failures (1nd order variable). *Note: ** P< .01; *P<.05, () = non-significant P-value.*

4.2.7 Failure in relation to performance

In order to test the final step of the moderation analysis, multiple regression analyses on the dependent variable performance were executed. The results are shown in table 12. In model 1 only the control variables are taken into consideration while in model 2 and 3 the first and second order variables of causation and effectuation are included as independent variables. Since the effects of the control variables in the first models are already shown in table 6 and discussed in the first step of the moderation analysis they will be left out in this section. Looking at the results in table 12 no significant relationships exists between the main construct of failure and all three dependent variables. Significant effects are only found in the regression models with the dependent variable financial performance. In model 2, the main construct of failure is together with the control variables regressed on financial performance. The results show that also in this model experience (B= -.370, p <.01) and CEO experience (B= .333, p <.05) significantly influences failure. The model explains 17.9 % of the variance in financial performance and shows with a significant F-ratio, at .05 level, an overall good fit. Model 3 shows also significant effects of experience (B= -.379, p <.01) and CEO experience (B= .310, p <.05) on financial performance but has despite a higher R^2 of 19.2%, a non-significant F-ratio (p=.071). These results in combination with the lack of significance in the direct effects between causation/ effectuation and performance and causation / effectuation and failure show that the criteria for moderation are not met.

	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Dependent variable	Financial performance	Financial performance	Financial performance	Incremental Innovation	Incremental Innovation	Incremental Innovation	Radical Innovation	Radical Innovation	Radical Innovation
Uncertainty	-.206 (.088)	-.203 (.095)	-.174 (.168)	.297 (.065)	.285 (.076)	.220 (.176)	.256 (.186)	.242 (.211)	.203 (.309)
Experience	-.366**	-.370**	-.379**	-.038 (.810)	-.018 (.908)	.013 (.934)	.252 (.184)	.274 (.152)	.286 (.141)
Start-ups	.078 (.388)	.077 (.401)	.091 (.333)	.073 (.544)	.080 (.508)	.060 (.616)	.142 (.329)	.150 (.305)	.124 (.403)
CEO Experience	.332*	.333*	.310*	-.077 (.660)	-.082 (.643)	-.079 (.660)	-.309 (.148)	-.314 (.142)	-.231 (.296)
Company Age	-.031 (.670)	-.036 (.632)	-.021 (.781)	-.041 (.673)	-.020 (.838)	-.051 (.608)	-.019 (.867)	.004 (.973)	.000 (.999)
Amount of FTE	.027 (.661)	.032 (.622)	.038 (.568)	.125 (.135)	.107 (.213)	.077 (.368)	.109 (.280)	.088 (.394)	.096 (.363)
Failure(2nd order)		-.081 (.748)			.351 (.297)			.397 (.329)	
Number of failure			-.096 (.600)		.	.020 (.932)			.505 (.084)
Impact of failure			.067 (.758)			-.089 (.751)			-.119 (.731)
Recognition time of failure			.125 (.448)			-.247 (.248)			.114 (.664)
Internal failure			-.062 (.724)			.385 (.090)			-.041 (.881)
N	101	101	101	101	101	101	101	101	101
R^2	.177	.179	.192	.093	.106	.165	.086	.097	.126

Table 12 - Regression models of failure on performance. *Note: ** P< .01; *P<.05, () = non-significant P-value.*

4.2.8 Curvilinear effects

The next point of interest is whether or not a (inverted) curvilinear effect exist of causation and effectuation. Adding a squared term to the equation checks the presence of curvilinear effects. In comparison to linear regression the significance of curvilinear effects is not assessed by the significance of the individual coefficient but by evaluating the changes in R^2 and the associated changes of the F-value. The results show that no curvilinear effects exit for causation and effectuation in relation to the second order variable failures. The R squared does nott change at all after adding the squared term the equation. For causation the R squared remains .004 and for effectuation .009. Also the F-values remains almost the same. The changes in the F-values are for causation .003 and for effectuation .028. Preceding regression analyses on the sub factors of failures also lacked curvilinear effects. It can be concluded that no u-shaped or inverted u-shaped effects are present in the relation between causation or effectuation and failure.

4.3 Hypotheses overview

The table below, table 13, gives an overview of the tested hypotheses in this study and shows whether they are accepted or rejected.

Hypothesis	Description	Accepted/ Rejected
1a	SMEs with a high emphasis on causation in their entrepreneurial approach will make less failures than SMEs with low emphasis on causation.	Rejected
1b	SMEs with a high emphasis on effectuation in their entrepreneurial approach will make more failures than SMEs with low emphasis on effectuation.	Rejected
2a	SMEs with a high emphasis on causation in their entrepreneurial approach make bigger failures, with a higher impact on the firm, than SMEs with low emphasis on causation.	Rejected
2b	SMEs with a high emphasis on effectuation in their entrepreneurial approach make smaller failures, with a lower impact on the firm, than SMEs with low emphasis on effectuation.	Rejected
3a	SMEs with a high emphasis on causation in their entrepreneurial approach recognize failures later than SMEs with low emphasis on causation.	Rejected
3b	SMEs with a high emphasis on effectuation in their entrepreneurial approach recognize failures earlier than SMEs with low emphasis on effectuation.	Rejected
4a	Causation has a positive influence on the performance of SMEs.	Rejected
4b	Effectuation has a positive influence on the performance of SMEs.	Rejected
5	The mediating role of failures in the relationship between causation and performance is negative.	Rejected
6	The mediating role of failures in the relationship between effectuation and performance is positive.	Rejected

Table 13 - Summarizing table of accepted and rejected hypotheses.

5 DISCUSSION AND CONCLUSIONS

This chapter outlines the main findings of this research and the theoretical as well as the practical implications resulting from it. Furthermore the limitations of this study are outlined and future research recommendations are given. The final part of this chapter concerns an overall conclusion of the conducted research.

5.1 Main findings

This thesis examined the mediating role of failures in the relationship between the entrepreneurial approaches of causation and effectuation and performance. Based on the literature review the mediating role of failures was expected to be positive in the relationship between effectuation and performance, and negative in the relation between causation and performance. In order to test these relationships an online survey research was conducted with 312 SME entrepreneurs, which resulted in 101 useful cases. A response rate of 32,4%. After assessing the data for reliability and validity, correlation and regression analyses were performed to test the relationships. By missing significant effects of causation and effectuation in direct relation to failure and performance the mediating role of failures could not be determined. Therefore, all the hypothesis have been rejected to a lesser or higher degree. However, important results were found.

Sarasvathy (2001a) proposed in her article that effectuation is the inverse of causation and utilized a grounded theory methodology to identify both constructs, causation and effectuation. In the subsequent years, scholars followed with conceptual research to described how, when, and why effectuation can be used in contrast to causation. The next step in theory building process is the development of valid measures and test proposed relationships. This research takes this next step, and in doing so makes four contributions. First, by combining two existing scales that measures causation and effectuation, this study developed, refined, and provided validating information for measures of causation and effectuation in entrepreneurship. Second, a reliable and valid scale for measuring failures in SMEs is developed. Thirdly, empirical evidence was found about the formative nature of the construct Effectuation. Finally, relationships between affordable loss and failures are established. It is shown that affordable loss is negatively related to failures and the sub-factors impact of failures, number of failures and internal failures. In the subsequent paragraph`s, the main findings as well as the hypotheses are discussed in order to answer the central research question: *"What are the effects of the entrepreneurial approaches of causation and effectuation on failure and how do those effects influence the performance of an SME?"*.

5.1.1 Causation and Effectuation in relation to failure

At first, the relationship between causation/effectuation and number of failures has been analyzed. Following the theoretical explanations, it was hypothesized that causation would have a negative and effectuation would have a positive effect on number failures. The results of the analysis show this not to be the case on construct level. As mentioned by Kraaijenbrink et al. (2011), causation and effectuation should be investigated at a finer level of granularity in order to find significant results. Results of this

research confirm this expectation. The effectuation dimensions means orientation and affordable loss were found to be significantly related to number of failures. Means orientation is found to be positively and affordable loss negatively related to number of failures. The latter, is surprising since the literature review indicated that effectual entrepreneurs tend to make more failures than causation oriented entrepreneurs. A reasons for this outcome can be find in the sampling bias of this study. All the participants of this study completed a management development program at TSM Business School. This educational program focused on business management a had a strong focus on causation. This implies, that due to their education, a preference for causation approaches exists by the participants in the sample. This bias should be taken into account when conclusions of this finding are formed. Drawing conclusions about the significant relationship between means orientation and number of failures is also difficult due to a low Cronbach`s alpha of means orientation($\alpha$ = 0.56). This low Cronbach`s Alpha of means orientation suggest that the underling items are not internally consistent with each other and that therefore conclusions about the effects of means orientation might not hold in different setting. On the other hand it should be noticed that this low Cronbach`s alpha could be due to the explorative nature of this study and the low number of items of the dimension.

Furthermore, goals orientation shows to be negatively related with number of failures, as a result of the split between the combined scales of Brettel et al. (2011) and Wiltbank et al. (2009). This finding is in line with the expectations of Dew et al. (2009b), that goal driven action or the predictive process of identifying goals and plans to achieve those goals, is a careful selection process that ultimately leads to fewer failures. It is the first empirical evidence of a relation between expected return and failure. However, it is good to mention and compare this finding with the research of Wiltbank et al. (2009) since they expected the opposite outcome in their study. They thought that a predictive approach would lead to more failures under uncertainty than a control based approach. The reason for this expectation was that in uncertain situations forecasting is particularly challenging given multiple sources of uncertainty on which the predictions are based and therefore leads to more failures. However, the analyses controlled uncertainty. As mentioned above, the preferences for causation of the entrepreneurs could also affect the significance in this relationship. It should therefore be suggested to test this relation in further research. It should be mentioned that this result was found significant after splitting the scales of Brettel et al. (2011) and Wiltbank et al. (2009)and with only the questions of the Brettel et al. (2011) being retained. This is important to mention since the use of Brettel et al. (2011) scale afforded closer adherence to the original conceptualization of the causation, by integrating four key dimensions, than the scale developed by Wiltbank et al. (2009).

Secondly, the relationship between causation/effectuation and impact of failures has been analyzed. It was expected that causation would have a positive and effectuation a negative effect on impact on failures. Since these hypotheses were not supported on construct level, analyses with the dimensions of causation and effectuation were performed. The results showed that affordable loss is negatively related to impact of failures. An explanation can be found in theory, which supports this outcome. According to Dew et al. (2009b) an entrepreneur who is using affordable loss, focuses on the downside information of an opportunity and determines how much he is willing to lose instead of focusing on how

much is needed to achieve that opportunity. By using this principle the entrepreneur allows him/herself to enter the opportunity earlier and at lower risk than an approach based on expected return. At this point the entrepreneur is unwilling to wager on expectations of high returns or on their own ability to predict. Which means that they are conservative in their investments. Subsequently, the investments of the entrepreneur grow as a function of survival but when an "external shock" occurs, the entrepreneur using affordable loss is almost losing less than predicted oriented entrepreneurs who based their decisions on expected return (Dew, Sarasvathy, Read, & Wiltbank, 2009b).

As third, the relationship between causation/effectuation and recognition time of failures has been analyzed. Following the theory, as explained in chapter two ´Theory and Hypotheses`, it was hypothesized that causal approaches would have a negative and effectual approaches would have a positive effect on the recognition time of failure in SMEs. Despite the expected directions of both relationships, the hypotheses were not supported due to a non-significant p-value. Even when the dimensions of causation and effectuation were regressed on recognition time, no significant results were found. In my opinion this was partly caused by the type of questions used in the questionnaire. The way the questions were constructed, the respondents were seduced to give politically correct answers. Furthermore, when looking at the results given on both questions of recognition time, most respondents gave for each sub question the same answer. This resulted in reliable ($\alpha = 0.86$), but, in my opinion invalid questions. Another explanation might be that it is hard to give correct answers to the questions, since it could be hard to remember what the exact recognition times in the entrepreneur`s company are. Looking into the theory, the non-significant results could also be explained by the fact that entrepreneurs with an effectuation approach just do not see the failures as early as expected due to the fast changing and uncertain environment in which they are in (Brown & Eisenhardt, 1997).Contrary, this should also be the case for causation oriented entrepreneurs and one would then expect to see significant relations for causation in relation to recognition time of failure. But this is not the case. Therefore, it is suggested to look at other type of questions to investigate the relation between causation/ effectuation and recognition time of failure.

5.1.2   Causation and Effectuation in relation to performance

In order to test the mediating role of failure and confirm earlier findings of positive effects of causation and effectuation on performance, it was hypothesized that both, causation and effectuation would have a positive effect on performance. The results showed that causation has a positive but non-significant effect on performance and that effectuation had a negative non-significant effect on performance. One of the reasons for these findings, besides the abovementioned lack of granularity, could be the type of measure used in this research. In this study, performance is measured by growth of the turnover, profit and market share. Same as the measures that have been applied in other effectuation studies as well. However, they are used in a different context which could suggest that these performance indicators might not be the same across industries or firm development stages. Theory states that it has always been difficult to measure performance in entrepreneurship correctly regarding the many different outcomes and measures that have been used (Read, Song, & Smit, 2009). Because of this difficulty another performance indicator, innovation performance, was used. By regressing causation and

effectuation on innovation performance, it was found that causation is significantly related to incremental innovation performance. However due to a non-significant F-value of the model, model 2 in table 6, this significance may simply be due to chance. The low correlation coefficient (.217*) supports this assumption. But the significant Beta (.694*) indicates that this finding might hold with different measures or in a different data set. The positive effect of causation on incremental innovation would have made sense, because causation is based on goal driven action, in which small and careful thought steps are made in order to achieve a predefined goal. This logic is supported by the study of Brettel et al. (2012) which finds that the dimensions of causation acts as the performance drivers of R&D projects with low innovativeness. Besides the positive relation between causation and effectuation, it was found that effectuation was also positively related to radical innovation performance but with a p-value of .110 becoming non-significant. Looking again to the dimensions of causation and effectuation, expected return was found to be significantly related to performance. This finding confirms the expectations of the literature review, that planned market research enhances performance in management settings and provides important empirical evidence for entrepreneurship theory. Previous studies to causation and effectuation were not able to report findings about the expected return in relation with performance (Read, Song, & Smit, 2009) (Wiltbank, Read, Dew, & Sarasvathy, 2009).

5.1.3 The mediating role of failure

Finally, the mediating role of failure in the relationship between causation/ effectuation and performance was hypothesized. It was expected that there was a mediating role of failure in both relationships and that the mediating effect in the relation between causation and performance would be negative and in the relation between effectuation and performance would be positive. However, due to the lack of direct effects of causation and effectuation on performance, causation and effectuation on failure and failure on performance, it can be concluded that failure does not mediate the relationships between causation and performance and effectuation and performance. According to the theory one might ask whether all of the steps have to be met for mediation (Kenny, Kashy, & Bolger, 1998). For full mediation all steps have to be met but most contemporary analysts believe that the direct effects of causation/effectuation on failure and the direct effect of failure on performance are essential for mediation. In this perspective, mediation could be present due to the direct effect of affordable loss on failure. However, due to the missing effect of failure on performance, it can also be concluded that partial mediation is absent in this study. Despite the missing mediating effect of failure, an important finding is established. The negative effect of affordable loss on failure. This negative effect is contrary to my preconceived expectations but can be explained by the findings of Dew et al. (2009b). According to these authors affordable loss is about taking risk and determining what someone is willing to lose in order to follow a course of action. By determining what an entrepreneur is willing to lose he/she sets an upper limit on time, money and effort that he/she wants to put at risk. This amount of risk is much lower in comparison to entrepreneurs using expected return. On the other hand, entrepreneurs who are using the affordable loss principle tend to take the "plunge decision" earlier in order to experiment with different options and therefore have a higher chance of making failures (Dew, Sarasvathy, Read, & Wiltbank, 2009b). According to theory risk is: the chance of the risk multiplied by the impact of the risk

(Kliem & Ludin, 1997). By approaching the risk of failure in this way, the negative effect of affordable loss on failure can be explained by the "underinvestment" at the time of the plunge decision (Dew, Sarasvathy, Read, & Wiltbank, 2009b). Consequently it can be concluded that the "underinvestment" has a bigger influence on failure then the chance that was expected in the introduction.

5.1.4 Nature of the construct of Effectuation

Based on the empirical results of this study some questions arise about the nature of the constructs of causation and effectuation. After analyzing these questions, it can be suggested to view effectuation as a formative construct instead of a reflective construct.

Sarasvathy (2001a) proposed in her research that effectuation can be regarded as the inverse of causation and that both constructs should be view as constructs on opposite ends of a continuum. However findings of this study and previous studies has shown that this distinction is much more complicated (Chandler, DeTienne, McKelvie, & Mumford, 2009) (Wiltbank, Read, Dew, & Sarasvathy, 2009) (Perry, Chandler, & Markova, 2012) (Kraaijenbrink, Ratinho, & Groen, 2012). Chandler et al. (2009) found in their validation study that the items that propose to reflect effectuation processes were not significantly related with each other and formed a multidimensional construct. Wiltbank et al. (2009) and Kraaijenbrink et al. (2012) found evidence of the independence of the effectuation dimensions of control and means orientation. Results of this study confirm these findings and suggest to view effectuations as a formative construct. Evidence for this formative nature of effectuation is based on three findings. As first, it is based on the requirement of interrelated indicators (Coltman, Devinney, Midgley, & Venaik, 2008). This study showed that the dimensions of effectuation compared to the main construct of effectuation differ in significance with the dependent variables. No significant relationships could be established between the main construct of effectuation and a dependent variable while this was the case for several dimensions of effectuation. Secondly, it is based on the low Cronbach`s alpha of the construct of effectuation ($\alpha = 0.62$) which suggest low inter-correlations between the dimensions of effectuation. The third reason for the formative nature can be found in the low explained variance of the dependent variables by the dimensions of effectuation. The results in chapter four show that the explained variance in combination with the control variables do not exceed 36%. This indicates that not all the dimensions of effectuation are covered in the regression models. It implies that effectuation exists with more than five dimensions. This is in line with the expectations of Kraaijenbrink et al. (2012) who proposed that effectuation could be made up of many different dimensions. It would be fruitful to scrutinize this possibility in further research.

5.2 Theoretical and practical implications

The findings of this study have some implications for theory and practice. It contributes in several ways to entrepreneurship, and specifically to the theory of causation and effectuation.

The first contribution is the development of an extensive and reliable ($\alpha = .81$) scale which measures failures in SMEs. Only a small number of papers in the entrepreneurship literature have attempted to

operationalize failures. Failures is an underexposed topic in today`s entrepreneurship literature and scholars tend to favor papers about success rather than failure. Yet failure may also be quite functional in the way that it provides opportunities to learn and improve. Other researchers can use this scale to collect data and make important steps in development of this topic in entrepreneurship. The second contribution of this study is a database with causal and effectual data of 101 experienced entrepreneurs of SMEs. This database can be used for further research to the topic of causation, effectuation, failures and performance.

Besides these general contributions to theory, this research made two important contributions to the field of entrepreneurship and specifically to the use of causation and effectuation. It provides evidence of the formative nature of effectuation and established a link between the dimensions of causation/ effectuation and failures.

With her research to effectuation, Sarasvathy (2001a) opposed causation and effectuation as two constructs on opposites ends of a continuum. This view supposes that both constructs have a reflective nature. However, this reflective nature of effectuation is questioned by several scholars (Perry, Chandler, & Markova, 2012).This study contributed to this discussion with evidence of a formative nature of the construct effectuation. It was found that the dimensions of effectuation have different effects on the dependent variables than the main construct of effectuation (significant versus non-significant), therefore are not interchangeable, a prerequisite for a reflective construct. Furthermore, low inter-correlation between the dimensions of effectuation and the low explained variance suggested that effectuation should be regarded as a multi-dimensional construct with independent dimensions. The findings are line with the studies of Wiltbank et al. (2009) and Kraaijenbrink et al. (2012) who found evidence that independence of the dimensions means orientation and control. Additionally, the low amount of explained variance in the dependent variables indicates that other sub constructs could be part of effectuation. Further research should point out which kind of dimensions these are.

Besides these conceptual contributions, this research has made some empirical contributions. By establishing an empirical link between the dimensions of causation, effectuation, failure and performance this study addressed an avenue of research that was never realized before and which is fruitful for the development of the theory of causation and effectuation. Due to the nascent state of development of the construct, most of the research up to now, has been conceptual and focused on how, when, and why effectuation can be used in contrast to causation (Perry, Chandler, & Markova, 2012). This research took the next step in the theory building process, by developing scales to measure causation and effectuation and test their relationships with other constructs. By studying the mediating role of failure in the relationship between causation/ effectuation and performance, this thesis adds empirical evidence of the effects of causation and effectuation to the theory. It is the first evidence of relations between causation/ effectuation and failure.

The findings of this study also has several practical implications. Most importantly, it shows that trial and error or experimenting with as many strategies as possible within the given means, leads to a

reduction of failures and failures with lower impact. This implication is of great importance for the effectuation discourse in entrepreneurship education. Since most of the entrepreneurship education, especially in the Netherlands, is based on the traditional causal planned approach. This research provides empirical evidence, though limited, that the use of one of the effectuation dimensions, affordable loss, leads to a decrease instead of the expected increase of failure and that the failures that are made enhance learning and thus the performance of the firm (Wiltbank, Read, Dew, & Sarasvathy, 2009). However, a subsequent empirical effect on performance should be established in further research. The results furthermore call for a more simultaneous use of the effectuation and causation dimensions, which enables entrepreneurs to probe the future and ultimately increase the performance of the firm.

Altogether, the implications of this study creates an excellent starting point for, a closer examination of the role of failure in the relation with causation, effectuation and performance, and additional research to nature of the construct of effectuation. In doing that it bridges an important gap in theory and practice and opens new avenue for entrepreneurship education.

5.3   Conclusion

By means of this research new insights were obtained about the nature and effects of the constructs causation and effectuation. This research has empirically shown that affordable loss as a sub-factor of effectuation negatively influences failures and its sub-factors impact of failures. This means that entrepreneurs who use the affordable loss principle reduce the impact of failure when losses are made, due to their under investment at the time of the 'plunge decision'. These findings reject previous work on the positive effects of affordable loss in failure (Dew, Sarasvathy, Read, & Wiltbank, 2009b) (Wiltbank, Read, Dew, & Sarasvathy, 2009). Reason for this opposite findings could be that effectual entrepreneurs use different principles of effectuation and causation at the same time, as shown in this research. However, it should also be noticed that the empirical findings of this study could be caused by, the sampling bias, the fact that the education of all entrepreneurs was, partly, based on causation. This preference for causation implies that the entrepreneurs rely on prediction instead of control and focus on the predictable aspect of the future, and therefore could significantly predict a negative relationship between affordable loss and failure.

By investigating the mediating role of failure in the relationships between causation/ effectuation and performance this research has shown that effectuation can be viewed as formative construct. By missing significant effects of causation and effectuation on failure and performance, the mediating role of failures could not be determined and all the hypotheses of this study were rejected to a lesser or higher degree. However, in order to established significant relationship between causation/ effectuation and failures, the constructs of causation and effectuation were analyzed at a finer level of granularity, at dimension level. This resulted in the abovementioned findings. However, the differences in significance between the main construct of effectuation and its dimensions, provided important information about the nature of the construct of effectuation. Results showed that effectuation and its dimensions are not

interchangeable, that the dimensions of effectuation do correlate with each other and that all regression had difficulties to explain the variance in the dependent variables . Based on these findings and in combination with the empirical evidence of previous research to the constructs of effectuation it is suggested that the construct of effectuation should be viewed as a formative model.

Based on the collected data, and the findings based on this data, this research provides a contribution to theory concerning the concepts of causation, effectuation and failure. For this reason I hope that these findings will stimulate other scholars to conduct further research on the role of failure in relation between causation, effectuation and the performance of SMEs.

5.4   Limitations and further research

This study is not without limitations. Without decreasing the value of the results of this study, and apart from the unavoidable time and resource constraints, there are tradeoffs inherent to the design choices and the approach to the empirical analysis. These limitations can be a great starting point for further research.

The most important limitation of this study is the sample. As mentioned in chapter 3 the sample consists, solely, of entrepreneurs who completed a management development program at TSM Business School. This means the sample may be biased, which could affect the internal and external validity of this study. An important threat for the internal validity is the type of education that the entrepreneurs experienced during their program at TSM Business School. This education was mainly focused on business management and therefore closely related to causation. Despite the fact that most of the entrepreneurs followed this program many years ago, this limitation weakens the findings of this study. As mentioned by Sarasvathy (2001a) these more causation oriented entrepreneurs base their decisions on different aspects than effectual oriented entrepreneurs, which imply that they face risk and failure in a different way. This bias also influences the external validity of this study by the limited generalization of the findings. Besides the same type of education of these entrepreneurs most of them are also primarily based in the region of Twente, the Netherlands. For this reason it can be assumed that the participants in this study experience the same environmental conditions and have to a higher degree the same attitude towards failure. Therefore it is possible that people in other countries or even regions within the Netherlands, face failure in a different way leading to a different outcome of the study. Therefore the outcome of this study can only be generalized to SMEs in the region of Twente, the Netherlands. Another bias of the sample is the sample size. 101 respondents imposes limits on the statistical validity of this study. This sample size is according to Field (2009) the absolute minimum for performing quantitative research and open possibilities for statistical errors. The findings and conclusions of this research should therefore be validated in further research with larger numbers of participants. Elaborating on the sample of this study, this research focused on relatively experienced entrepreneurs. For further research, it would be interesting to find out if a difference exists between novice and expert entrepreneurs in making and dealing with failures.

A second limitation of this study is the method of operationalization of the construct for failure. Because of the few empirical papers that operationalize failure and the, relatively, fast development of the question of failure in this study, it can be questioned if this research perfectly measures the theoretical construct of failure. Which means that questions can be posed about the construct validity of this study. Questions can also be asked about the statistical conclusions and the validity of this study. This may be because the validity of the factor analysis, is solely based on my own interpretation and assessed in combination with the reliability of the construct. Nevertheless, the scale of failure could be enhanced in further research by additional literature studies to the role of failure in SMEs.

By establishing a link between the entrepreneurial approaches of causation/ effectuation, failures and performance insights about the effects of failures in SMEs in the Netherlands have been extended in this study. It would be fruitful to scrutinize if differences exists in the perception and attitude about failure between entrepreneurs of different cultures or regions. For example, between entrepreneurs in Europe and the United states. In the United States failure is seen as something good, something that results in a pat on the back, or even as a `must` for entrepreneurs to succeed in the future. This is in contrast to Europe where a more conservative view of `failure` exists. It is something to avoid and hush up (Cope, 2011).

Finally, further empirical research is needed to prove the formative nature of the construct of effectuation and to explore the underlying dimensions. As suggested by this study, effectuation could exist of more than five dimensions. Subsequently, valid and reliable measures should be developed in order to establish more consistent relationships between effectuation and new constructs as failure.

All in all, further research in the relations between causation, effectuation, failure and performance would be desirable. Important contributions can be made in theory, by additional literature research for the construct of failure and empirically, by testing the formative nature of effectuation.

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APPENDICES

Appendix 1 – Contrasting effectual against causal reasoning

Issue	Causal position	Effectual position
View of the future	*Prediction*. The future is a continuation of the past; can be acceptably predicted	*Design*. The future is contingent on actions by willful agents
Constructs pertaining to individual decisions		
Givens	*Goals* are given	*Means* (Who I am, what I know, and whom I know) are given
Decision agenda	*Resources*. What resources ought I to accumulate to achieve these goals?	*Effects*. What effects can I create with the means I have?
Basis for taking action	*Desired worlds*. Vision of a desired world determines goals; goals determine sub-goals, commitments, and actions	*Possible worlds*. Means and stakeholder commitments determine possible sub-goals—goals emerge through aggregation of sub-goals
Basis for commitment	*Should*. Do what you ought to do—based on analysis and maximization	*Can*. Do what you are able to do—based on imagination and satisficing
Stakeholder acquisition	*Instrumental view of stakeholders*. Project objectives determine who comes on board	*Instrumental view of objectives*. Who comes on board determines project objectives
Constructs in terms of responses to the environment		
Predisposition toward risk	*Expected return*. Calculate upside potential and pursue (risk adjusted) best opportunity	*Affordable loss*. Calculate downside potential and risk no more than you can afford to lose
Predisposition toward contingencies	*Avoid*. Surprises may be unpleasant. So invest in techniques to avoid or neutralize them.	*Leverage*. Surprises can be positive. So invest in techniques that are open to them and leverage them into new opportunities.
Attitude toward success/failure	*Outcomes*. Success and failure are discrete outcomes to be sought after or avoided, respectively	*Process*. Successes and failures are inputs into a process that needs to be managed such that failures are outlived and successes are accumulated
Attitude toward probability estimates	*Update beliefs*. Estimates are used in a Bayesian fashion—to update ones beliefs about the future.	*Manipulate conditionals*. Estimates signal which conditionals may reified or falsified so the future can be skewed through action.
Attitude toward others	*Competition*. Constrain task relationships with customers and suppliers to what is necessary	*Partnership*. Build YOUR market together with customers, suppliers and even prospective competitors
Underlying logic	To the extent we can predict the future, we can control it	To the extent we can control the future, we do not need to predict it

Source: Contrasting Effectual against Causal reasoning (Sarasvathy & Dew, 2005a, p. 390)

Appendix 2 – Guide and questions for online questionnaire (Dutch)

Toelichting

Fijn dat u mee wilt werken aan mijn onderzoek! Het invullen van de vragenlijst duurt +/- 15-20 minuten. De vragen hebben betrekking op de strategie, de bedrijfsomgeving, de fouten en de prestaties van uw organisatie. De vragen zijn voornamelijk stellingen die u snel kunt beantwoorden door aan te geven of u het er eens of oneens mee bent.

De vragenlijst bestaat uit 5 blokken met in totaal 51 vragen. Elk blok wordt ingeleid met een korte uitleg. Mocht u gedurende de enquête eerdere vragen willen wijzingen kunt u op de knop (Vor.) klikken om terug te gaan naar de gewenste pagina en op de knop (Volg.) om weer vooruit te bladeren.

Door op de knop (Volg.) te klikken begint u met de vragenlijst. Alvast bedankt voor uw medewerking!

Het eerste gedeelte gaat over strategische keuzes binnen uw organisatie. Geef voor elke stelling aan in hoeverre u het ermee eens of oneens bent. (1 = zeer oneens; 2 = grotendeels oneens; 3 = lichtelijk oneens; 4 = lichtelijk eens; 5 = grotendeels eens; 6 = zeer eens). Wanneer u deze vragen beantwoordt; baseer uw antwoord dan op de (corporate) strategie van uw organisatie van het afgelopen jaar, januari tot en met december 2012. Wanneer er gedurende 2012 grote wijzigingen in uw strategie hebben plaatsgevonden, baseer uw antwoord dan op de strategie die aan het begin van 2012 werd gevolgd.

Geef voor onderstaande stellingen aan in hoeverre u het ermee eens of oneens bent. (1 = zeer oneens; 2 = grotendeels oneens; 3 = lichtelijk oneens; 4 = lichtelijk eens; 5 = grotendeels eens; 6 = zeer eens)

1. Het startpunt voor nieuwe projecten is gebaseerd op..

onze bedrijfsdoelstellingen.	1 2 3 4 5 6
onze beschikbare middelen en hulpbronnen.	1 2 3 4 5 6

2. Op basis van..

de beschikbare middelen/hulpbronnen werden projectdoelstellingen gedefinieerd.	1 2 3 4 5 6
de projectdoelstellingen werden middelen/hulpbronnen gedefinieerd.	1 2 3 4 5 6

3. Bij het selecteren van nieuwe projecten baseerden wij onze beslissingen op...

het minimaliseren van risico's en verliezen.	1 2 3 4 5 6
potentiële opbrengsten.	1 2 3 4 5 6

4. Beslissingen voor investeringen waren voornamelijk gebaseerd op..

potentiele opbrengsten.	1 2 3 4 5 6
het minimaliseren van risico's en verliezen.	1 2 3 4 5 6

5. Wij hebben de risico's van onze nieuwe projecten..

verminderd door middel van toezeggingen vooraf van partners en/of klanten.	1 2 3 4 5 6
geïdentificeerd door middel van systematische marktanalyse.	1 2 3 4 5 6

6. Wij hebben onze beslissingen voor nieuwe projecten genomen..

gezamenlijk met onze stakeholders uitgaande van onze eigen competenties.	1 2 3 4 5 6
op basis van systematische marktanalyse.	1 2 3 4 5 6

7. Onverwachte resultaten/bevindingen zijn..

alleen meegenomen wanneer initiële projectdoelstellingen in gevaar kwamen.	1 2 3 4 5 6
vaak geïntegreerd, ondanks dat dit niet overeen kwam met de initiële projectdoelstelling.	1 2 3 4 5 6

8. Onze werkwijze is gericht op..
het aanpassen van projectdoelstellingen wanneer er sprake is van nieuwe resultaten/bevindingen. 1 2 3 4 5 6
het bereiken van projectdoelstellingen zonder vertraging. 1 2 3 4 5 6

9. Als u informatie verzamelde over uw strategie, dan..
- onderzocht u markttrends en voorspellingen gemaakt door experts. 1 2 3 4 5 6
- sprak u met mensen die u al kende en vroeg hen u te steunen bij het realiseren van de strategie. 1 2 3 4 5 6

10. Als u een marktbenadering ontwikkelde, dan..
- onderzocht u de aanpak van uw concurrenten. 1 2 3 4 5 6
- bedacht u deze op basis van uw eerdere ervaringen. 1 2 3 4 5 6

11. Wanneer u nadacht over de onzekerheid van een markt voor een idee, ging u door..
- omdat u met uw acties een toekomst kon creëren die u wenste. 1 2 3 4 5 6
- omdat u met uw expertise de onzekerheid kon beperken. 1 2 3 4 5 6

12. Bij de ontwikkeling van een nieuw(e) product/dienst, dan..
- ontwikkelde u nieuwe oplossingen op eigen kracht, concurrenten moesten volgen. 1 2 3 4 5 6
- vergeleek u de voortgang met de ontwikkeling van uw concurrenten. 1 2 3 4 5 6

13. Als u keek naar voorspellingen waar de markt naar toeging, dan..
- gebruikte u deze om in te schatten wat uw bedrijf kon bereiken. 1 2 3 4 5 6
- negeerde u deze voorspellingen omdat ze de impact van uw innovatie niet meenamen. 1 2 3 4 5 6

14. In het opzetten van een business(-unit) of project baseerde u uw strategie op..
- wat u kon en welke middelen u tot uw beschikking had. 1 2 3 4 5 6
- relevante voorspellingen en analyses. 1 2 3 4 5 6

15. Als u keek naar de verwachtingen die anderen hadden over uw sector, dan..
- maakte u aangepaste voorspellingen voor de resultaten van uw bedrijf. 1 2 3 4 5 6
- stelde u zich voor hoe uw organisatie deze voorspellingen kon veranderen. 1 2 3 4 5 6

Het tweede gedeelte gaat over fouten binnen uw organisatie. In deze studie is een fout gedefinieerd als: een handeling die leidt tot enige vorm van schade (verlies van tijd, geld, reputatie of klanten) aan uw organisatie. Baseer bij de volgende vragen uw antwoord op de fouten die het afgelopen jaar, januari tot en met december 2012, gemaakt zijn. Geef voor onderstaande stellingen aan welk antwoord het best bij uw organisatie past.

Geef voor onderstaande stellingen aan welk antwoord het best bij uw organisatie past.

16. Binnen onze organisatie zijn er:

fouten gemaakt door de nieuwigheid van werkzaamheden.	geen/ zelden / af en toe / regelmatig / vaak
fouten gemaakt door de complexiteit van werkzaamheden.	geen/ zelden / af en toe / regelmatig / vaak
fouten gemaakt door tijdsdruk.	geen/ zelden / af en toe / regelmatig / vaak
fouten gemaakt door miscommunicatie.	geen/ zelden / af en toe / regelmatig / vaak
fouten gemaakt door mismanagement.	geen/ zelden / af en toe / regelmatig / vaak
fouten gemaakt door invloeden van buitenaf.	geen/ zelden / af en toe / regelmatig / vaak

17. Hoe vaak zijn er fouten gemaakt:

die invloed op klanten/ leveranciers hadden?	geen/ zelden / af en toe / regelmatig / vaak
waar klanten/ leveranciers niets van merkten?	geen/ zelden / af en toe / regelmatig / vaak
die vertraging richting klanten/ leveranciers hadden?	geen/ zelden / af en toe / regelmatig / vaak
die vertraging in het interne proces tot gevolg hadden?	geen/ zelden / af en toe / regelmatig / vaak
die budgetoverschrijding tot gevolg hadden?	geen/ zelden / af en toe / regelmatig / vaak

18. Hoe groot was de totale:

impact van de gemaakte fouten op klanten/ leveranciers (externen)?	zeer klein/ klein/ behoorlijk/ groot/ zeer groot
impact van interne fouten in tijd?	zeer klein/ klein/ behoorlijk/ groot/ zeer groot
impact van interne fouten in geld?	zeer klein/ klein/ behoorlijk/ groot/ zeer groot
vertraging richting klanten/ leveranciers (externen) als gevolg van de gemaakte fouten?	zeer klein/ klein/ behoorlijk/ groot/ zeer groot
vertraging in het interne proces als gevolg van de gemaakte fouten?	zeer klein/ klein/ behoorlijk/ groot/ zeer groot
budgetoverschrijving als gevolg van de gemaakt fouten?	zeer klein/ klein/ behoorlijk/ groot/ zeer groot

19. Hoeveel procent (%) van de:

gemaakte fouten had invloed op klanten/ leveranciers?	.... %
gemaakte fouten waren fouten waar klanten/ leveranciers niets van merkten?	.... %
gemaakte fouten had lichte schade tot gevolg?	.... %
gemaakte fouten had zware schade tot gevolg?	.... %

externe opdrachten verliep binnen de afgesproken tijd? .... %
externe opdrachten verliep binnen de afgesproken prijs? .... %
<u>interne</u> opdrachten verliep binnen de afgesproken tijd? .... %
<u>interne</u> opdrachten verliep binnen de afgesproken prijs? .... %

Geef voor onderstaande stellingen aan in hoeverre u het ermee eens of oneens bent. (1 = zeer oneens; 2 = grotendeels oneens; 3 = lichtelijk oneens; 4 = lichtelijk eens; 5 = grotendeels eens; 6 = zeer eens)

20. Binnen onze organisatie zijn er:
fouten gemaakt die lichte schade tot gevolg hadden. 1 2 3 4 5 6
fouten gemaakt die zware schade tot gevolg hadden. 1 2 3 4 5 6
weinig fouten gemaakt en als die gemaakt werden hadden ze lichte schade tot gevolg. 1 2 3 4 5 6
weinig fouten gemaakt en als die gemaakt werden hadden ze zware schade tot gevolg. 1 2 3 4 5 6
regelmatig fouten gemaakt die lichte schade tot gevolg hadden. 1 2 3 4 5 6
regelmatig fouten gemaakt die zware schade tot gevolg hadden. 1 2 3 4 5 6

21. Wij herkenden:
fouten die invloed hadden op klanten/ leveranciers snel. 1 2 3 4 5 6
interne fouten (fouten waar klanten/ leveranciers niets van merkten) snel. 1 2 3 4 5 6
fouten die tot vertragingen leidden snel. 1 2 3 4 5 6
fouten die lichte schade tot gevolg hadden snel. 1 2 3 4 5 6
fouten die zware schade tot gevolg hadden snel. 1 2 3 4 5 6

22. Wij konden:
fouten die invloed hadden op klanten/ leveranciers snel oplossen. 1 2 3 4 5 6
interne fouten (fouten waar klanten/ leveranciers niets van merkten) snel oplossen. 1 2 3 4 5 6
fouten die tot vertragingen leidden snel oplossen. 1 2 3 4 5 6
fouten die lichte schade tot gevolg hadden snel oplossen. 1 2 3 4 5 6
fouten die zware schade tot gevolg hadden snel oplossen. 1 2 3 4 5 6

Het derde gedeelte gaat over de prestaties van uw organisatie. Baseer bij de volgende vragen uw antwoord op de prestaties van uw organisatie van het afgelopen jaar, januari tot en met december 2012. Geef voor onderstaande stellingen aan welk antwoord het best bij uw organisatie past.

Geef voor onderstaande stellingen aan welk antwoord het best bij uw organisatie past.

23. Hoeveel full time medewerkers (FTE) heeft uw organisatie?

-         ....medewerkers

24. Hoe heeft het aantal FTE zich ontwikkeld in 2012 vergeleken met 2011?

-         sterk afgenomen   (> 20 %)
-         afgenomen   (0% - 20%)
-         gelijk gebleven   (0%)
-         toegenomen   (0% - 20%)
-         sterk toegenomen (>20%)

25. Hoe groot was uw omzet in 2012?

-          < 500.000
-         500.000 – 2.500.000
-         2.500.00 – 5.000.000
-         5. 000. 000 – 10.000.000
-         10.000.000 – 25.000.000
-         25.000.000 – 50.000.000
-         > 50.000.000

26. Hoe heeft de omzet zich ontwikkeld in 2012 vergeleken met 2011:

-         sterk afgenomen   (> 20 %)
-         afgenomen   (0% - 20%)
-         gelijk gebleven   (0%)
-         toegenomen   (0% - 20%)
-         sterk toegenomen (>20%)

27. Wat was uw bedrijfsresultaat in 2012?

-        groot verlies
-        verlies
-        break-even
-        winst
-        grote winst

28. Hoe heeft het bedrijfsresultaat zich ontwikkeld in 2012 vergeleken met 2011?

-        sterk afgenomen   (> 20 %)
-        afgenomen   (0% - 20%)
-        gelijk gebleven   (0%)
-        toegenomen   (0% - 20%)
-        sterk toegenomen (>20%)

29. Wat was uw marktaandeel in 2012?

-        < 5%

-        6% -10%

-        11% - 25%

-        26% – 50%

-        > 51%

-        geen idee

30. Hoe heeft het marktaandeel zich ontwikkeld in 2012 vergeleken met 2011?

-        sterk afgenomen   (> 20 %)
-        afgenomen   (0% - 20%)
-        gelijk gebleven   (0%)
-        toegenomen   (0% - 20%)

- sterk toegenomen (>20%)
- geen idee

Onderstaand treft u telkens twee stellingen tegenover elkaar. Geef het punt tussen de stellingen aan dat het best past bij de <u>belangrijkste markt</u> waarin uw organisatie zich bevindt.

31.De vraag naar onze producten/ diensten fluctueert maar de snelheid van deze verandering is gematigd en stabiel.	0 0 0 0 0	De vraag naar onze producten/ diensten fluctueert sterk.
32. Er zijn technische innovaties gaande in onze branche maar dit heeft weinig invloed op het voortbestaan van onze producten/ diensten.	0 0 0 0 0	Er zijn technische innovaties gaande in onze branche die het voorbestaan van onze producten/ diensten serieus beïnvloeden.
33. De wensen en voorkeuren van onze klanten zijn voorspelbaar en daarom goed bij ons in beeld.	0 0 0 0 0	De wensen en voorkeuren van onze klanten zijn niet te voorspellen en daarom moeilijk in te schatten.
34. Wij zijn goed in staat om te voorspellen welke technische innovaties invloed hebben op onze producten/ diensten.	0 0 0 0 0	Wij kunnen niet voorspellen welke toekomstige technische innovaties invloed hebben op onze producten/ diensten.
35. Wij kunnen voorzien welke innovaties nodig zijn om rendabel te blijven in onze huidige markt.	0 0 0 0 0	Wij kunnen niet voorzien welke innovaties nodig zijn om rendabel te blijven in onze huidige markt.
36. Wij zijn in staat de acties van onze concurrenten te voorspellen en hebben daardoor voldoende tijd om te profiteren van de introductie van onze nieuwe producten/ diensten.	0 0 0 0 0	Wij hebben geen inzicht in hoe onze concurrenten reageren op de introductie van onze nieuwe producten/ diensten en kunnen dus niet voorspellen hoelang we daarvan kunnen profiteren.

Deel 4 - innovatie van uw organisatie

Het vierde gedeelte gaat over de innovatie van uw organisatie. Baseer bij de volgende vragen uw antwoord op de innovatie van uw organisatie in de afgelopen twee jaar, januari 2011 tot en met december 2012.

37. Heeft uw organisatie de afgelopen twee jaar veranderingen doorgemaakt die als nieuw worden gezien voor uw organisatie maar door andere organisaties al gebruikt zijn? Zijn dit veranderingen op het gebied van.. (omcirkel een antwoord in elke rij)

-       Nieuwe producten   Ja   Nee
-       Nieuwe diensten   Ja   Nee
-       Nieuwe productiemethodes   Ja   Nee
-       Openen van nieuwe markten   Ja   Nee
-       Nieuwe manieren van bevoorraden   Ja   Nee
-       Nieuwe manieren van organiseren   Ja   Nee

38. Heeft uw organisatie de afgelopen twee jaar veranderingen doorgemaakt die als nieuw worden gezien in de bedrijfstak waarin uw bedrijf opereert? Zijn dit veranderingen op het gebied van.. (omcirkel een antwoord in elke rij)

-       Nieuwe producten   Ja   Nee
-       Nieuwe diensten   Ja   Nee
-       Nieuwe productiemethodes   Ja   Nee

Het vijfde gedeelte gaat over de huidige situatie van u en uw organisatie. Wanneer u deze vragen beantwoordt; baseer uw antwoord op u en uw organisaties huidige situatie (tot en met nu, juli 2013).

39. Wat is uw geslacht?
-        Man
-        Vrouw

40. Wat is uw hoogst genoten opleiding?
-        Lagere school
-        VMBO / MAVO
-        HAVO
-        VWO
-        MBO
-        HBO
-        WO
-        Post doctoraal

41. Wat is uw leeftijd?
-        < 35 jaar
-        36 – 45 jaar
-        46 – 55 jaar
-        56 – 65 jaar
-        > 65 jaar

42. Hoeveel jaren werkervaring heeft u?
-        0 – 5 jaar
-        6 – 15 jaar
-        16 – 25 jaar
-        26 – 35 jaar
-        > 35 jaar

43. Hoeveel jaren daarvan bent u directeur (geweest)?
-       0 – 5 jaar
-       6 – 15 jaar
-       16 – 25 jaar
-       26 – 35 jaar
-       > 35 jaar

44. Hoeveel jaar daarvan bent u directeur van uw huidige organisatie?
-       0 – 5 jaar
-       6 – 15 jaar
-       16 – 25 jaar
-       26 – 35 jaar
-       > 35 jaar

45. Hoeveel bedrijven heeft u gestart?
-       0 bedrijven
-       1-2 bedrij(f)(ven)
-       3-4 bedrijven
-       5-6 bedrijven
-       > 6 bedrijven

46. Hoeveel jaar bestaat uw huidige organisatie?
-       0 – 10 jaar
-       11 – 25 jaar
-       26 – 50 jaar
-       51 – 100 jaar
-       > 100 jaar

47. In welke sector is uw organisatie actief?

- Agro
- Bouwnijverheid
- Detailhandel
- Horeca
- ICT
- Industrie
- Kunst, cultuur, media
- Onderwijs
- Vervoer
- Zakelijk dienstverlening
- Zorg

Persoonlijke en bedrijfsgegevens (optioneel)

48. Naam van uw bedrijf :………………………………………

49. Uw naam :………………………………………

50. Uw email adres :………………………………………

51. Ontvangen kopie onderzoeksresultaten : Ja / Nee

Appendix 3 – E-mail invitation for online survey (Dutch)

Aanhef: Impact van fouten op de prestaties van MKB-bedrijven: uitnodiging onderzoek TSM Business School

Geachte heer/ mevrouw,

Enige tijd geleden heeft u deelgenomen aan de opleiding Directievoering van TSM Business School. Naar aanleiding daarvan zou ik u willen vragen of u mee wilt werken aan een onderzoek wat ik voor TSM en de Universiteit Twente uitvoer.

Ik zal me kort voorstellen, mijn naam is Ernst Eijsvogel en naast mijn werkzaamheden bij TSM ben ik aan het afstuderen voor mijn master Bedrijfskunde aan de Universiteit van Twente. Hiervoor doe ik onderzoek naar het effect van verschillende strategieën op fouten die bedrijven maken en kijk ik welke impact die fouten hebben op de prestaties van het Midden en Klein Bedrijf.

Bent u op de hoogte welke fouten er binnen uw organisatie worden gemaakt en wat de impact ervan is op de prestaties van uw organisatie? Door mee te werken aan dit onderzoek helpt u mij niet alleen met afstuderen maar krijgt u ook inzicht in het effect van fouten die binnen het MKB worden gemaakt. Het invullen kost hooguit 15 tot 20 minuten. De vragenlijst treft u via de volgende link:

Mede namens TSM hoop ik dat u een bijdrage wilt leveren aan dit onderzoek en daarmee de kennisontwikkeling van onze Business School. Mocht u vragen, opmerkingen of suggesties hebben, dan kunt u contact met mij opnemen via onderstaande contactgegevens.

Met vriendelijke groeten,

Ernst Eijsvogel
Business Development
TSM Business School

T: 053 - 489 5425
e.eijsvogel@tsm.nl
www.tsm.nl

Let op: Als u geen verdere e-mails van ons wilt ontvangen, klik dan op de onderstaande koppeling. U wordt dan automatisch van de mailing lijst verwijderd.[RemoveLink]

Appendix 4 – Measurement scale Brettel et al. (2011)

Effectuation (Brettel et al., 2012)

Means-orientation (**α** =.82)
1) Our project was specified on the basis of given resources (e.g. capabilities within team).
2) The starting point for the project was given means and resources.
3) Starting with given means, the project target was defined.
4) Starting point of our project was rather available resources than concisely given project targets.
*) The target of our project was clearly defined in the beginning (reverse-coded).

Affordable loss (**α** = .76)
1) Decisive for the project were considerations about potential losses.
2) The selection of options for our project was mostly based on a minimization of risks and costs.
3) We mainly considered the potential risk of the project.
4) Decisions on capital expenditures were primarily based on potential risks of losses.

Partnerships (**α** = .73)
1) We tried to reduce risks of the project through internal or external partnerships and agreements.
2) We jointly decided with our partners/stakeholders on the basis of our competences.
3) Our focus was rather on the reduction of risks by approaching potential partners and customers.
4) In order to reduce risks, we started partnerships and received pre-commitments.

Leverage the unexpected (**α** = .79)
1) New, surprising results and findings were integrated – even though this was not necessarily in line with the original targets.
2) Our mode of operation was flexible enough to always adjust targets to new findings.
*) The project planning was carried out in small steps during the project implementation.
4) Despite potential delays in project execution, we were flexible and took advantage of opportunities as they arose.
5) We allowed the project to evolve as opportunities emerged – even though the opportunities weren't in line with the original project target.
6) Potential setbacks or external threats were used as advantageously as possible.

Causation (Brettel et al., 2012)

Goals-orientation (**α** = .90)
1) Our project was specified on the basis of given targets.
2) The starting point for the project was concrete company targets.
3) Starting with given project targets, the required means/resources were defined.
4) Starting point of our project was concisely given company targets.
*) The target of our project was clearly defined in the beginning.

Expected returns (**α** = .81)
1) Decisive for the project were considerations about potential returns.
2) The selection of options for our project was mostly based on calculations of potential returns.
3) We mainly considered the potential odds of the project.
4) Decisions on capital expenditures were primarily based on potential returns.

Competitive analysis (**α** = .92)
1) We tried to identify risks of the project through thorough market analysis.
2) We have taken our decisions on the basis of systematic market analysis.
3) Our focus was rather on the early identification of risks through market analysis in order to be able to adopt our approach.
4) In order to reduce risks, we focused on market analyses and forecasts.

Overcome the unexpected (**α** = .79)
1) New, surprising results and findings were only integrated when the original project target was at risk.
2) Our mode of operation focused on reaching target without any delay.
*) The project planning was basically carried out at the beginning of the project.
4) We first of all took care of reaching our initially defined project targets without delay.
5) We have always focused on reaching the initial project target.
*) Potential setbacks or external threats were avoided by the use of upfront market analysis.

*) Item eliminated during factor analysis

Source: Brettel et al. (2011)

Appendix 5 – Measurement scale Wiltbank et al. (2009)

1. As you assemble information on this business, you would:
Disagree   Indifferent Agree
1 2 3 4 5 6 7   Talk with people you know to enlist their support in making this become a reality.
1 2 3 4 5 6 7   Study expert predictions of where the market is "heading".

2. As you develop a marketing approach for this product you will:
1 2 3 4 5 6 7   Research the competitors' approaches.
1 2 3 4 5 6 7   Imagine possible courses of action based on your prior experience.

3. When you think about the uncertainty of a market for this idea, you move forward anyway because:
1 2 3 4 5 6 7   Your expertise allows you to influence that uncertainty.
1 2 3 4 5 6 7   Your actions can create a future you value.

4. As you manage product development, you will be driven by:
1 2 3 4 5 6 7   Comparing your progress against the development of competitors.
1 2 3 4 5 6 7   Creating new solutions on your own terms, any competitors will have to keep up.

5. If you were to look at predictions for where potential markets are heading you would:
1 2 3 4 5 6 7   Use them to create forecasts of what your business might accomplish over time.
1 2 3 4 5 6 7   Discount them as they do not incorporate the impact of your innovation.

6. In situations like this, it is important to base strategy on:
1 2 3 4 5 6 7   Relevant forecasts and analyses.
1 2 3 4 5 6 7   What you are capable of, given the means available to you.

7. As you learn about the expectations other people have for this industry, you:
1 2 3 4 5 6 7   Imagine ways your venture will change aspects of the situation they are forecasting.
1 2 3 4 5 6 7   Form updated predictions of likely outcomes for the business.

Source: Wiltbank et al. (2009)

Appendix 6 – Factor loadings principal component analyses

Causation (Brettel et al., 2012 & Wiltbank et al., 2009)	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Goals-orientation					
Op basis van de projectdoelstellingen werden middelen/hulpbronnen gedefinieerd.	0.85				
Het startpunt voor nieuwe projecten is gebaseerd op onze bedrijfsdoelstellingen.	0.69				
In het opzetten van een business(-unit) of project baseerde u uw strategie op relevante voorspellingen en analyses.	0.52				
Wanneer u nadacht over de onzekerheid van een markt voor een idee, ging u door omdat u met uw expertise de onzekerheid kon beperken.	0.47				
Competitive analysis					
Wij hebben onze beslissingen voor nieuwe projecten genomen op basis van systematische marktanalyse.		0.91			
Wij hebben de risico's van onze nieuwe projecten geïdentificeerd door middel van systematische marktanalyse.		0.85			
Als u keek naar de verwachtingen die anderen hadden over uw sector, dan maakte u aangepaste voorspellingen voor de resultaten van uw bedrijf.		0.45			
Prediction					
Als u een marktbenadering ontwikkelde, dan onderzocht u de aanpak van uw concurrenten.			0.77		
Bij de ontwikkeling van een nieuw(e) product/dienst, dan vergeleek u de voortgang met de ontwikkeling van uw concurrenten.			0.72		
Als u keek naar voorspellingen waar de markt naar toeging, dan gebruikte u deze om in te schatten wat uw bedrijf kon bereiken.			0.55		
Overcome the unexpected					
Onverwachte resultaten/bevindingen zijn alleen meegenomen wanneer initiële projectdoelstellingen in gevaar kwamen.				0.74	
Als u informatie verzamelde over uw strategie, dan onderzocht u markttrends en voorspellingen gemaakt door experts. (a)				0.66	
Onze werkwijze is gericht op het bereiken van projectdoelstellingen zonder vertraging. (b)				-	
Expected returns					
Beslissingen voor investeringen waren voornamelijk gebaseerd op potentiele opbrengsten.					0.88
Bij het selecteren van nieuwe projecten baseerden wij onze beslissingen op potentiele opbrengsten.					0.57
Cronbach`s Alpha coefficient (Cronbach, 1951):	0.63	0.69	0.57	0.25	0.50

Extraction method: PCA. Rotation method: Varimax with kaiser normalization.

Effectuation (Brettel et al., 2012 & Wiltbank et al., 2009)	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Partnerships					
Als u informatie verzamelde over uw strategie, dan sprak u met mensen die u al kende en vroeg hen u te steunen bij het realiseren van de strategie.	0.71				
Wanneer u nadacht over de onzekerheid van een markt voor een idee, ging u door omdat u met uw acties een toekomst kon creëren die u wenste.	0.67				
Wij hebben de risico's van onze nieuwe projecten verminderd door middel van toezeggingen vooraf van partners en/of klanten.	0.59				
Als u een marktbenadering ontwikkelde, dan bedacht u deze op basis van uw eerdere ervaringen.	0.54				
Wij hebben onze beslissingen voor nieuwe projecten genomen gezamenlijk met onze stakeholders uitgaande van onze eigen competenties.(b)	-				
Control					
Als u keek naar de verwachtingen die anderen hadden over uw sector, dan stelde u zich voor hoe uw organisatie deze voorspellingen kon veranderen.		0.79			
Als u keek naar voorspellingen waar de markt naar toeging, dan negeerde u deze voorspellingen omdat ze de impact van uw innovatie niet meenamen.		0.67			
Bij de ontwikkeling van een nieuw(e) product/dienst, dan ontwikkelde u nieuwe oplossingen op eigen kracht, concurrenten moesten volgen.		0.62			
Affordable loss					
Bij het selecteren van nieuwe projecten baseerden wij onze beslissingen op het minimaliseren van risico's en verliezen.			0.89		
Beslissingen voor investeringen waren voornamelijk gebaseerd op het minimaliseren van risico's en verliezen.			0.73		
Means-orientation					
Op basis van de beschikbare middelen/hulpbronnen werden projectdoelstellingen gedefinieerd.				0.72	
In het opzetten van een business(-unit) of project baseerde u uw strategie op wat u kon en welke middelen u tot uw beschikking had.				0.69	
Het startpunt voor nieuwe projecten is gebaseerd op onze beschikbare middelen en hulpbronnen.				0.64	
Leveraging the unexpected					
Onverwachte resultaten/bevindingen zijn vaak geïntegreerd, ondanks dat dit niet overeen kwam met de initiële projectdoelstelling.					0.77
Onze werkwijze is gericht op het aanpassen van projectdoelstellingen wanneer er sprake is van nieuwe resultaten/bevindingen.					0.59
Cronbach`s Alpha coefficient (Cronbach, 1951):	0.55	0.58	0.74	0.56	0.25

Extraction method: PCA. Rotation method: Varimax with kaiser normalization.

Failures	Factor 1	Factor 2	Factor 3	Factor 4
Impact of failures				
Hoe groot was de totale impact van de gemaakte fouten op klanten/ leveranciers (externen)?	0.76			
Binnen onze organisatie zijn er regelmatig fouten gemaakt die zware schade tot gevolg hadden.	0.72			
Hoe vaak zijn er fouten gemaakt die vertraging richting klanten/ leveranciers hadden?	0.66			
Binnen onze organisatie zijn er fouten gemaakt door de complexiteit van werkzaamheden.	0.63			
Hoe groot was de totale vertraging richting klanten/ leveranciers (externen) als gevolg van de gemaakte fouten?	0.62			
Binnen onze organisatie zijn er regelmatig fouten gemaakt die lichte schade tot gevolg hadden.	0.61			
Hoe vaak zijn er fouten gemaakt die invloed op klanten/ leveranciers hadden?	0.59			
Hoe groot was de totale impact van interne fouten in geld?	0.58			
Hoe groot was de totale budgetoverschrijving als gevolg van de gemaakt fouten?	0.57			
Binnen onze organisatie zijn er fouten gemaakt die zware schade tot gevolg hadden.	0.57			
Hoe vaak zijn er fouten gemaakt die budgetoverschrijding tot gevolg hadden?	0.55			
Binnen onze organisatie zijn er weinig fouten gemaakt en als die gemaakt werden hadden ze lichte schade tot gevolg. (a)	0.53			
Binnen onze organisatie zijn er fouten gemaakt door de nieuwigheid van werkzaamheden.	0.48			
Recognition time of failures				
Wij herkenden fouten die tot vertragingen leidden snel.		0.79		
Wij herkenden fouten die lichte schade tot gevolg hadden snel.		0.75		
Wij herkenden interne fouten (fouten waar klanten/ leveranciers niets van merkten) snel.		0.73		
Wij konden fouten die lichte schade tot gevolg hadden snel oplossen.		0.73		
Wij herkenden fouten die zware schade tot gevolg hadden snel		0.70		
Wij konden interne fouten (fouten waar klanten/ leveranciers niets van merkten) snel oplossen.		0.69		
Wij konden fouten die invloed hadden op klanten/ leveranciers snel oplossen.		0.68		
Wij herkenden fouten die invloed hadden op klanten/ leveranciers snel.		0.65		
Wij konden fouten die tot vertragingen leidden snel oplossen.		0.59		
Wij konden fouten die zware schade tot gevolg hadden snel oplossen. (c)		-		
Internal failures				
Hoe groot was de totale impact van interne fouten in tijd?			0.73	
Hoe groot was de totale vertraging in het interne proces als gevolg van de gemaakte fouten?			0.66	
Hoe vaak zijn er fouten gemaakt waar klanten/ leveranciers niets van merkten?			0.60	
Hoe vaak zijn er fouten gemaakt die vertraging in het interne proces tot gevolg hadden?			0.56	

Binnen onze organisatie zijn er fouten gemaakt die lichte schade tot gevolg hadden.			0.50	
Number of failures				
Binnen onze organisatie zijn er fouten gemaakt door invloeden van buitenaf. (b)				0.61
Binnen onze organisatie zijn er fouten gemaakt door tijdsdruk.				0.59
Binnen onze organisatie zijn er fouten gemaakt door miscommunicatie.				0.58
Binnen onze organisatie zijn er fouten gemaakt door mismanagement.				0.47
Binnen onze organisatie zijn er weinig fouten gemaakt en als die gemaakt werden hadden ze zware schade tot gevolg.				0.47
Cronbach`s Alpha coefficient (Cronbach, 1951): 0.83	0.86	0.74	0.66	

Extraction method: PCA. Rotation method: Varimax with kaiser normalization. Criteria: 4 factors extracted.

Appendix 7 – Measurement scale Johannessen et al. (2001)

Incremental innovation
Has your company made changes during the last three years that were perceived to be new for the company, but which have previously been used by other firms, within the following areas? (Please circle one response in each row).

- New products   Yes No
- New services   Yes No
- New methods of production   Yes No
- Opening new markets   Yes No
- New sources of supply   Yes No
- New ways of organizing   Yes No

Radical innovation
Has your company made changes during the last three years that were perceived to be new to the industry in which the company operates, within the following areas? (Please circle one response in each row).

- New products   Yes No
- New services   Yes No
- New methods of production   Yes No
- Opening new markets   Yes No
- New sources of supply   Yes No
- New ways of organizing   Yes No

Source: Johannessen et al. (2001)