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**Erkki Kurkinen**

# Reasoning of Using Causation and Effectuation Logic

Implications on Start-up Performance  
and Internationalization

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UNIVERSITY OF JYVÄSKYLÄ  
FACULTY OF INFORMATION  
TECHNOLOGY

JYU DISSERTATIONS 47

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**Erkki Kurkinen**

# **Reasoning of Using Causation and Effectuation Logic**

## **Implications on Start-up Performance and Internationalization**

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## ABSTRACT

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New start-up companies are the basis for expansive companies. Expansive companies are extremely important for employment and for business growth. For this reason, it is important to know the processes how start-up companies are built up.

In this research, the relations between prior entrepreneurial experience, prior international experience, effectuation and causation, financial performance and degree of internationalization were studied among the Finnish knowledge intensive business services (KIBS) start-up companies. The research utilized mixed methods and comprised of two parts, qualitative and quantitative parts. The former part included setting the research propositions based on the literature review, interviews of ten KIBS companies, analysis of the interview data using directed content analysis by coding the transcripts based on pre-determined codes of effectuation and causation dimensions and finally, verification of research propositions confirming them. Further, four hypotheses were set. The latter part included the test of the relations between prior entrepreneurial experience, prior international experience, effectuation and causation, financial performance and degree of internationalization.

The study results suggested that entrepreneur's own prior entrepreneurial experience has a strong positive and statistically significant effect on preferred use of effectuation instead of causation. Similarly, entrepreneur's international experience was found to have a strong positive and statistically significant effect on effectuation whereas the same parameter had a small negative effect of causation. Effectuation was found to have strong positive and statistically significant effect on company's degree of internationalization whereas causation was found to have no effect on that. Moreover, effectuation was found to have no effect on company's financial performance, whereas causation was found to have a moderate positive effect on that.

Causation and effectuation were able to explain 14.2 per cent of the variance of the degree of internationalization. However, none of them were able to explain the variance of financial performance statistically significantly.

Keywords: prior entrepreneurial experience, international experience, financial performance, internationalization, effectuation, causation, KIBS, SEM, ESEM, critical incidents technique, quantitative research, qualitative research, start-up

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## TIIVISTELMÄ (FINNISH ABSTRACT)

Kurkinen, Erkki

Perusteluja suunnittelu- ja kehittämislogiikan käytölle – vaikutukset start-up yrityksen taloudelliseen menestykseen ja kansainvälistymiseen

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Start-up yritykset ovat kasvuyritysten perusta. Kasvuyritykset ovat erittäin tärkeitä työllisyyden ja liiketoiminnan kasvun kannalta. Siksi on tärkeää tuntea niitä prosesseja, joiden mukaan start-up yrityksiä käynnistetään. Tässä tutkimuksessa tutkittiin suomalaisten osaamisintensiivisten yrityspalvelu-yritysten (engl. KIBS) perustajien aiemman yrittäjäkokemuksen, aiemman kansainvälisen kokemuksen, kehittämis- ja suunnitteluologiikan käyttämisen, yrityksen taloudellisen suorituskyvyn ja kansainvälistymisasteen keskinäisiä suhteita. Tutkimus oli monimenetelmätutkimus, jossa oli kaksi osaa, laadullinen ja määrällinen osa. Laadullinen osuus sisälsi kirjallisuuskatsauksen ja tutkimusväittämien muodostamisen, kymmenen yrityksen haastattelut sekä niiden analysoinnin ohjatun sisältöanalyysin avulla koodaamalla kehittämis- ja suunnittelulogiikoiden löydetty ominaisuudet ennaltamääritellyjä koodeja käyttäen. Lopuksi tutkimusväittämät todennettiin. Sen lisäksi laadittiin neljä tutkimusolettamaa. Määrällisessä osuudessa testattiin aiemman yrittäjäkokemuksen, aiemman kansainvälisen kokemuksen, kehittämis- ja suunnitteluologiikan käyttämisen, yrityksen taloudellisen suorituskyvyn ja kansainvälistymisasteen keskinäisiä suhteita testaamalla asetetut olettamet.

Tutkimustulokset viittaavat siihen, että yrittäjän omalla aiemmalla yrittäjäkokemuksella on vahva positiivinen ja tilastollisesti merkitsevä vaikutus kehittämislogiikan käytön suosimiseen suunnittelulogiikan sijasta. Myös yrittäjän kansainvälisellä kokemuksella löydettiin olevan vahva positiivinen ja tilastollisesti merkitsevä vaikutus kehittämislogiikan käyttöön, kun taas sillä oli lievä negatiivinen vaikutus suunnittelulogiikan käyttöön. Kehittämislogiikalla todettiin olevan vahva positiivinen ja tilastollisesti merkitsevä vaikutus yrityksen kansainvälistymisasteeseen, kun taas suunnittelulogiikalla sitä vaikutusta ei voitu todeta. Kehittämislogiikalla ei löydetty olevan vaikutusta yrityksen taloudelliseen suorituskykyyn, kun taas suunnittelulogiikalla oli siihen lievä positiivinen vaikutus. Kehittämis- ja suunnittelulogiikoiden käyttö selittivät 14.2 prosenttia kansainvälistymisasteen vaihtelusta. Kumpikaan niistä ei selittänyt yrityksen taloudellisen suorituskyvyn vaihtelua.

Avainsanat: yrittäjäkokemus, kansainvälinen kokemus, taloudellinen suorituskyky, kansainvälistyminen, kehittämislogiikka, suunnittelulogiikka, KIBS, SEM, kriittiset tapahtumat, määrällinen tutkimus, laadullinen tutkimus, start-up

## ACKNOWLEDGEMENTS

The background of this dissertation goes back to one period in my life already years ago. At that time, I was working as a business ombudsman to help in creating new businesses by assisting wannabe entrepreneurs in their new venture creation. Some candidates had clear view and a plan how to operate in the future in their new start-ups, whereas others had no clue what to do and how to operate when, or if, or after their new venture was set up. Much later, when studying entrepreneurship in University of Jyväskylä, I started gradually to understand some regularities in start-up creation, and consequently, I became interested in entrepreneurship theories. I am thankful to, and would like to express my unbounded gratitude to D.Sc. Päivi Patja in Jyväskylä School of Business and Economics (JSBE) for her inspiring lessons in entrepreneurship and for conducting me to the depths of the theory of effectuation. This in turn led me to start the research on start-up entrepreneurship leading finally to this dissertation.

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This was my second dissertation. By finalizing this work, I have finally met the expectations of my ex-colleagues who have called me “Herr Doktor Doktor Kurkinen” for several years in the distant past.

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Käpyniemi, Konnevesi  
November, 2018  
Erkki Kurkinen

*Nullus est liber tam malus, ut non aliqua parte prodesset.*  
(Gaius Plinius Secundus, AD 79)

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## LIST OF ABBREVIATIONS

EIMS	European Innovation Monitoring System
EL	Entrepreneurial learning
ELT	Experiential learning theory
ESEM	Explorative Structural Equation Modeling
EU	European Union
BG	Born Global Company
CB-SEM	Covariance-Based Structural Equation Modeling
CE	Corporate Entrepreneurship
CFI	Comparative Fit Index
CIT	Critical Incident Technique
CMV	Common Method Variance
EIMS	European Innovation Monitoring System
ESEM	Explorative Structural Modeling
ICT	Information and Communication Technology
INV	International New Venture
IQR	Interquartile Range
KIBS	Knowledge Intensive Business Services
MIMIC	Multiple Indicator Multiple Causes
MLR	Robust Maximum Likelihood Estimator
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne
NV#n	New Venture number n
PLS	Partial Least Squares Modeling
PLS-SEM	Partial Least Squares Structural Equation Modeling
RMSEA	Root Mean Square Error of Approximation
SEE	Shapero's Entrepreneurial Event
SEM	Structural Equation Modeling
SME	Small-to medium-sized enterprise
SRMR	Standardized Root Mean Square Residual
TLI	Tuck-Lewis index
TPB	Theory of Planned Behavior
UE	Effectual Uppsala Model
VIF	Variance Inflation Factor

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ABSTRACT

TIIVISTELMÄ (FINNISH ABSTRACT)

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# 1 INTRODUCTION

## 1.1 Background and relevance of the topic

Quite recently, the economic growth in Finland has started recovering. During the last two years the economic growth has been substantially improved. Companies in Finland present more positive forecasts in their outlooks (Huovinen, 2018; Rikama, 2017). According to Statistics Finland's business and establishment register, Finland had 283 563 companies in 2016, excluding agriculture, forestry and fishing industry (Suomen Yrittäjät, 2018). At that time there were 1 376 557 employees in those companies. Total turnover of the ventures was EUR 385 billion. In Finland, 93.3 per cent (totaling 264 519 companies) of all companies were smaller than 10 employees. In Finland, they are called microenterprises. Further, small companies, having less than 50 employees, represent 5.5 per cent (totaling 15 725 companies) of all companies. Medium-sized companies (having 50 - 249 employees) have a share of 1.0 per cent (totaling 2 728 companies). Large companies have a share of 0.2 per cent (591) of all enterprises in Finland. Small and medium-sized enterprises (SME) employing less than 250 people accounted for 58 per cent of all businesses. Their staff accounted for 65.6 per cent of the total number of employees and their turnover of 58.4 per cent of enterprises' total turnover. No significant changes have taken place in recent years in these figures (Suomen Yrittäjät, 2018).

According to the latest available statistics, 28 533 new companies started in Finland 2016 (Suomen virallinen tilasto (SVT), 2017). At the same time 24 870 companies closed down, indicating that the net growth was 3 663 new companies. This rate of change has remained the same for the same three years. Most of the new companies were in professional, scientific and technical industry, totally 4 602 companies (16.1 per cent of all new companies). In Finland, new jobs have been created mainly in SMEs for the whole period starting from the year 2000. During the years 2011 - 2016 more than 115 000 new jobs were created in SMEs. More than 50 000 of those jobs were created in

small companies having less than 50 employees (Suomen virallinen tilasto (SVT), 2017; Suomen Yrittäjät, 2018).

Growth companies, or expansive companies as they are called as well, are companies which are willing to bring up their size exponentially. In Finland those companies have been followed actively by the Finnish authorities (Huovinen, 2018). They interviewed 4 800 companies between December 2017 and January 2018, and 480 companies of those were able to classify themselves as expansive companies in a 5-step scale where “expansive” represented the most expansionary choice. According to Huovinen (2018), of all SMEs in Finland, 10 per cent are expansive companies. Typically, those are young, almost 75 per cent were founded after the year 2000 and half of expansive companies were established after 2010. For them operating in international business is much common than among other types of companies.

By industry, Finnish expansive companies are divided very unevenly. In the year 2017, the biggest industry was the knowledge intensive business services (KIBS). Those companies accounted for 16 per cent of the expansive companies, whereas other business areas were smaller. Wholesale and retail accounted 13 per cent, industry 12 per cent, construction 5 per cent and other services 7 per cent. Of all companies 11 per cent were classified as expansive companies (Huovinen, 2018). KIBS companies are companies providing services to other companies and organizations. KIBS companies offer and trade business services and they are knowledge-intensive services based on professional knowledge of their employees (Kemppilä & Mettänen, 2003). In Finland, the role of KIBS sector as an incubator of new start-up companies has been seen important in creating more new businesses (Huovinen, 2018).

As a result, the role of the expansive companies is extremely important both for employment and for business development. Start-up companies are the basis for expansive companies. For this reason, it is important to know the process of building up new start-up companies. The research in hand focuses on these processes. Processes are examined through two prevailing research directions, through the causation logic and the effectuation logic. The causal planning logic is a traditional method of business pre-planning based on forecasting, and pre-planning of businesses (Chandler, DeTienne, McKelvie, & Mumford, 2011). It has been challenged by the effectuation logic, based more on identifying new opportunities and utilizing opportunities than pre-planning (Harms & Schiele, 2012; Sarasvathy, 2001a; Sarasvathy, 2001b; Sarasvathy & Dew, 2005) by suggesting that some of the successful world-famous start-up companies have been acted according to effectuation logic. The premise of this study is that the use these two logics are affected by the prior entrepreneurial and prior international experience of the entrepreneur.

There is a great amount of extant literature concentrating on the use, utilization, and effects of effectuation logic among start-up companies (Cai, Guo, Fei, & Liu, 2017; Eyana, Masurel, & Paas, 2017; Guo, Cai, & Zhang, 2016; Lundqvist, 2013; Qureshi & Mahdi, 2014; Reymen et al., 2015). The current literature on entrepreneurship, especially under uncertain circumstances which



are very characteristic for the start-up companies, has been concentrating either on planning and control, which can be seen as causal logic, or on flexible, collaborative and adaptive decision making, like improvisation and bricolage, which can be seen as effectuation logic (Reymen et al., 2015). On the other hand, it has been even suggested that the majority of the literature on effectuation presents it in the context of established companies, not in the context of start-up companies (Matalamäki, 2017). This suggestion has been done in spite of the fact that originally effectuation logic was developed in new venture creation setting (Read, Song, & Smit, 2009).

Effectuation has been suggested to be an antecedent of a successful and international business in several business areas. Quite recently, using multivariate linear regression, Cai et al. (2017) studied the effect of effectuation on the new venture performance. They suggested that effectuation had a significant positive effect on the new venture performance using 266 new ventures in manufacturing, computer, transmission, and software industries. Those results offer further support to the study in hand to explore the effect of effectuation on the new venture performance because, intuitively, the successful companies are more likely to grow, and are able to offer more job opportunities than those which are performing less.

Recent meta-analysis of the degree of internationalization of entrepreneurial firms suggested that there is a strong relationship between the degree of internationalization and company financial performance (Schwens et al., 2017). Likewise, the active internationalization has been suggested to accelerate the growth of KIBS companies and the development of the KIBS sector as a whole (Toivonen, Tuominen, Smedlund, & Patala, 2009). What's more, small and new firms, in particular knowledge-based companies, have been acknowledged to contribute for social and economic development in their home countries (Li, Yang, Yao, Zhang, & Zhang, 2012; Nițu-Antonie, Feder, & Munteanu, 2017). These results suggest that the degree of internationalization of a start-up company is a remarkable antecedent of a successful growth company. Hence, internationalization is hypothesized to be an important element in predicting the success of KIBS companies as well.

Regardless of the recent activities in this specific research area, the research activities on the emergence of Finnish KIBS companies are few and far between creating a gap in the research literature. The study in hand addresses this gap by exploring the founding processes of the early phase start-up companies, especially among KIBS companies in Finland. This is conducted by examining their initial stages through the lenses of two mainstream research designs, causal logic and effectuation logic antedated by prior entrepreneurial and prior international experience of the entrepreneur. The study tries to find out if the utilization of causal or effectuation logics are affected by these two antecedents, entrepreneurial and international experience of entrepreneur, and whether the use of causal and effectual logic have an effect on the company's future by assessing their effects on financial performance and degree of internationalization. The research method comprises both qualitative interviews

to set and verify research propositions, and to set hypotheses, and a quantitative questionnaire and statistical analysis to test hypotheses based on the verified research propositions, and to find support for the hypotheses, and finally both results combined, to find answers to the research questions. The premise of the research is that prior entrepreneurial and prior international experience of entrepreneur have an effect on the preferred use of either effectuation or causal logic, and that the applied logic has an effect on company's financial performance and on the degree of internationalization.

## **1.2 Knowledge intensive business services (KIBS) companies in Finland**

KIBS companies are companies providing services to other companies and organizations. KIBS companies offer and trade business services. They are knowledge-intensive companies based on professional knowledge of their employees. The companies of this kind either deliver products and services which are based on their own knowledge, or use their own knowledge of their experts and professionals to deliver products and services which help their customers to produce and deliver their own products and services. Consequently, KIBS companies usually have other businesses as their main customers. However, the public sector and sometimes voluntary organizations can be important customers. Likewise, to some extent households may act as customers of, for example, legal and accountancy KIBS services (Kemppilä & Mettänen, 2003).

KIBS companies may exist in almost all areas of the industry due to a growing importance of knowledge in the modern society, industry and technology. Originally the concept of KIBS was presented in European Innovation Monitoring System (EIMS) report in 1995 (Miles et al., 1995). KIBS companies are keen and important users of new technology. More importantly, they play even more important role as developers and carriers of new innovations as they are aggressive innovators in their own business and technology areas. KIBS companies mainly represent emerging new technologies. This is stated by Miles et al. (1995 p. III) by saying that "they are fed by the demands for knowledge generated by the uncertainties surrounding the performance of new technologies and the developmental trends characterizing them".

In Finland KIBS companies have an important role in creating new businesses. By industry, Finnish expansive companies in 2017 were divided very unevenly. The knowledge intensive business service (KIBS) companies accounted for 16 per cent of the expansive companies, whereas other business areas were smaller. Wholesale and retail accounted 13 per cent, industry 8 per cent, construction 6 per cent, and other services 7 per cent of the expansive companies. It has been estimated that there are totally ca. 30.000 KIBS

companies in Finland, and approximately 5000 new KIBS start-ups are founded every year (Huovinen, 2018).

Expansive companies in Finland are typically young. Of all expansive companies 50 per cent of them are founded in 2010 or later. Moreover, KIBS companies play an important role in the start-up creation and growth. Of all expansive companies founded after the year 2000 KIBS companies represent more than two thirds (Rikama, 2017). Furthermore, their expectations of the future outlook are more positive than those of other branches, as more than 50 per cent of KIBS companies estimated the future economical situation to grow in 2017. Already in 2003 it was estimated in Finland that KIBS companies deserve special attention. In addition to the fact that they are sources of innovations and agents of knowledge transfer, they are representative of dynamic and fast-growing sectors in the Finnish business life (Miles, 2003). Similarly, it was seen already in 2003 that most KIBS companies are SMEs.

What makes a company a KIBS company? In addition to a formal classification of KIBS according to business classification, there are some features which characterize KIBS companies (Kemppilä & Mettänen, 2003). First of all, as the acronym KIBS denotes, companies utilize knowledge as an input for their services. These services are based significantly on professional know-how of the personnel. These services are primary sources of information, or know-how to company's customers. Services may serve as inputs for the development of customer's know-how as well. There is a strong interaction between the customer and a KIBS company. In this interaction, knowledge is transferred and created. Oftentimes high know-how is needed from the customer's side. Finally, customers are either other companies or organizations (Kemppilä & Mettänen, 2003).

Why were KIBS companies designated as target group of the study in hand? One important occasion is that quite recently KIBS companies have been shown to have some specific manners in their ways they operate (Santos & Spring, 2015). Some of those manners refer outstandingly to effectuation. KIBS companies seem to rely profoundly on their expertise to oblige their customers in their delivery process. The repertoire of expertise encompasses several ways how experts can apply the knowledge they possess. The suggestion to operate according to effectuation can be seen for instance in the way how they react to unexpected situations. As Santos & Spring (2015 p. 22) state "KIBS providers also adopt problem management actions to control unexpected situations that result from limited customer participation", and further, "providers use their knowledge to explain why the alternative implemented is better or to come up with new ideas, which will not require much effort to accomplish". Therefore, instead of avoiding unexpected situations in the future, KIBS companies try to control their future, directly referring to basic principles of effectuation (Sarasvathy, 2001b). Another suggestion to effectuation is the structure of the human resources of KIBS companies. As already stated above, the services KIBS companies offer are based significantly on professional know-how of their personnel, or know-how about the needs of company's customers (Kemppilä &

Mettänen, 2003). Again, this allusion is linked directly to another basic effectuation feature, means oriented way to operate, in other words, starting with existing means: who I am, what I know, and whom I know (Sarasvathy, 2001b). Furthermore, small and new firms, in particular KIBS companies, have been proposed to contribute clearly for social and economic development in their home countries (Li et al., 2012; Nițu-Antonie et al., 2017).

The formal classification of KIBS companies varies depending on the purpose of the need. Officially the Statistical classification of economic activities in the European Community, abbreviated as NACE, is the classification of economic activities in the European Union (EU). The term NACE is derived from the French expression “Nomenclature statistique des activités économiques dans la Communauté européenne”. Various NACE versions have been developed since 1970 the current version being NACE Rev. 2. (European Commission, 2018). However, classification of KIBS companies has not gained consensus internationally. Therefore, country and research specific classification schemes make it difficult to compare different classifications unambiguously. In this research in hand the Finnish Standard Industrial Classification is used (Statistic Finland, 2009). As there is no agreed definition for the KIBS classes in terms of NACE codes, a comprehensive list of codes was compiled to select the sample companies for this study.

### **1.3 Purpose of the research**

The purpose of the research in hand was to study whether there is support for the effects of prior entrepreneurial experience and prior international experience on the preferred use of effectuation and causal logics in the new venture creation in Finland, especially among KIBS companies, and how the use of these two logics affect to the company’s future financial performance and degree of internationalization. The results of the study will help to understand better the underlying founding processes among entrepreneurs and will lend support to the utilization of the theories of causal and effectuation logics in entrepreneurship research. These, in turn, will help the academy in supporting the society to give the right and timely support to start-up entrepreneurs in their efforts to build and maintain sustainable and responsible business for the future.

### **1.4 Organization of the research**

This research is organized as follows. In the following chapter the relevant literature is presented and discussed followed by the introduction of the research framework. After that the methodology, data collection, and analysis of the qualitative part of the research are introduced followed by the results in

the following chapter. Then, the methodology, data collection and analysis of the quantitative part are introduced followed by the results in the following chapter. Concluding discussion on the results, contributions to the academy, implications to the practitioners, limitations of the study, and suggestions for future research followed by the summarizing section conclude the research.

## **1.5 Summary**

This chapter contained the introduction, background and relevance of the topic of the current research. It was noted that more research is needed in the area of start-up foundation regarding the effectuation and causality processes among the Finnish KIBS companies. The research gap, the purpose of the research and theoretical foundations were presented. The main purpose of the current research was defined as finding out if prior entrepreneurial experience and international experience of entrepreneur have an effect on the use of causal and effectuation logics in the founding processes among Finnish KIBS companies, and whether they have an effect on the company's financial performance and degree of internationalization. The structure of the study was also introduced.

The following chapter introduces the literature review on some of the prevailing theories on relevant entrepreneurship research. Moreover, the research propositions and research questions are set followed by the research framework of the study.

## **2 LITERATURE REVIEW AND RESEARCH FRAMEWORK**

Entrepreneurship is no doubt one of the major business disciplines. Entrepreneurship research in academia seeks answers, for instance, to how, who, and with what to create future supply and demand. On the other hand, entrepreneurial behavior is a complex phenomenon and entrepreneurs themselves are difficult to study. Even so, entrepreneurial behavior is a major area in entrepreneurial research (Chen, 2014; Davidsson, Baker, & Senyard, 2017; Miralles, Giones, & Gozun, 2017; Ozaralli & Rivenburgh, 2016). The purpose of this literature review is manifold. It tries to set the theoretical frame for the aim of the study. Further, it intends to present a deeper understanding on effectuation and causation logics, and on prior entrepreneurial and international experience of entrepreneurs, and on financial performance and internationalization of a start-up. Furthermore, it tries to present the theoretical consistency between causation, effectuation, prior entrepreneurial and international experience and company's financial performance and degree of internationalization. Effectuation and causation logics including their basic concepts are discussed first. Then, some literature on prior entrepreneurial and international experience are presented and discussed followed by the literature on the aspects of start-up company's financial performance and internationalization. Moreover, the research propositions and research questions are set followed by the research framework of the study.

### **2.1 Introduction to causation and effectuation logics**

Causal planning logic is a traditional method of business pre-planning based on both forecasting and business planning. Causation is a planning and prediction-oriented technique, and is able to combine a strict goal-oriented decision making into a profit maximization business planning technique. The theory and its applications were originally developed along the theories of economy and strategic management in order to understand how entrepreneurs were using their resources to achieve the pre-defined business targets (Lemos & Andreassi,

2015). Causation planning processes try to avoid surprises and use competitive analyses (Chetty, Ojala, & Leppäaho, 2015; Lemos & Andreassi, 2015; Smolka, Verheul, Burmeister - Lamp, & Heugens, 2016). The models using causal approach start with definition of a clear goal to be achieved. Then, appropriate means are selected. The opportunities are given, and the challenge is in finding them. Simply, it is a goal-driven process and exploitation of means to achieve the goal is dependent on resources (Kalinic, Sarasvathy, & Forza, 2014; Villani, Linder, & Grimaldi, 2018).

According to one popular definition, especially compared to effectuation process, "causation processes take a particular effect as given and focus on selecting between means to create that effect" (Sarasvathy, 2001b, p. 245). The main idea in the causation process is to reach a goal which is pre-defined (Kristinsson, Candi, & Sæmundsson, 2016). The process starts with a definition of the goal and focuses on introducing new means and selecting between them to reach that pre-defined goal. The uncertainty of the future is avoided by controlling the unexpected characteristics and incidents of the future. When different alternatives between the possible means to achieve the goal are compared, the main criteria is the expected returns (Kristinsson et al., 2016). Causation processes can be understood to answer to the questions of decision what to do to achieve a particular effect. As Chetty et al. (2015 p. 1438) explicate those processes referring to traditional marketing management textbook procedures for bringing a product or a service to market, causal processes may include, for instance, "analyzing long-run opportunities in the market, researching and selecting target markets, designing marketing strategies, planning marketing programs and organizing, implementing and controlling marketing effort". Hence, causation process relies on prediction and in that way the future is believed to be controlled.

Causation processes contain also rudiments from of strategic planning and ideas of avoiding surprises as it tries to predict the uncertain future using methods of strategic planning (Ansoff, 1980). According to this principle, in order to response to changing environmental conditions, management systems are needed. The methods may include elements like long range planning, strategic planning, strategic management, and strategic issues management. Avoiding surprises include such elements as minimizing damages in surprises, and following future trends (Ansoff, 1980). Some of these were inventions of 1950's and 1960's and are still in use today in the form of their modern versions. Likewise, causal processes contain an element of profit maximization and economic thinking with a strict goal orientation idea (Smolka et al., 2016).

The traditional causation planning logic has recently been challenged, and quite strongly, by the effectuation logic, originally introduced by Sarasvathy (2001b) based more on identifying new opportunities and utilizing opportunities than traditional pre-planning toward pre-set goals. Furthermore, it is "a theory of design that responds to uncertainty, goal ambiguities, and social enactment of meaning by employing of a logic that is complementary to traditional causation" (Valliere, 2017, p. 65). According to effectuation logic, an

entrepreneur willing to proceed towards the desired successful state of his or her new venture, starts from the current state and projects a range of new possible future states from which the next step would be selected. This means that instead of having goals and effects to achieve those goals as given, effectuating entrepreneur accepts the means as given and proceeds toward the goal where he or she can go using those means. The means of entrepreneurs can include three categories of means. Firstly, they know who they are, what they know, whom they know, and they know their own abilities, traits and tastes. Secondly, they recognize their knowledge corridors there are in, and thirdly, they know the social network they are part of (Sarasvathy, 2001b). The well-known example of the difference between effectuation and causation processes logic is cooking a meal. If using effectuation logic, the chef starts from the available ingredients and utensils, and he or she has to imagine the possible menus which can be made of those ingredients, and then prepares a meal. On the contrary, if using causation process making a meal, the chef gets the menu as given and then selects the ingredients to prepare the meal (Sarasvathy, 2001b).

It has been suggested that effectuation inverts all aspects of causation rationality including problem space, solution process, fundamental principles and overall logic (Read & Sarasvathy, 2005). The main principles of the causation and effectuation logics are presented in FIGURE 1 (source: Society for Effectual Actions, 2018).

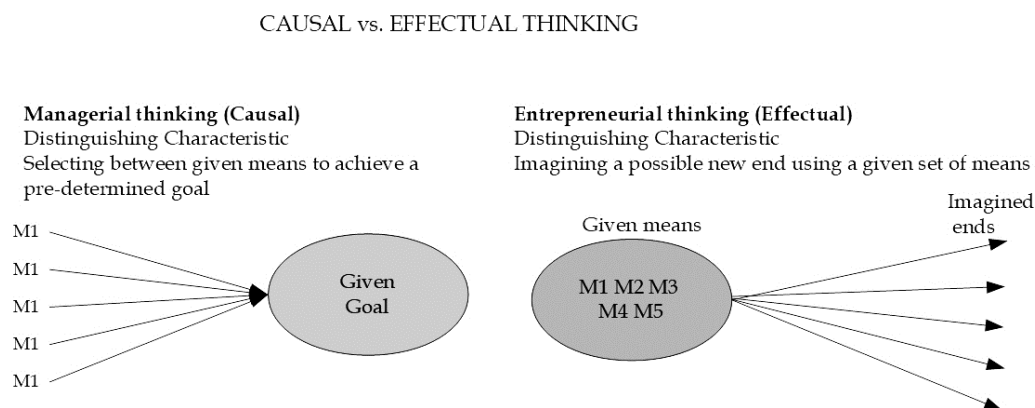


FIGURE 1 Causal and effectuation logic comparison

In the original proposal of the effectuation as the rudimentary theory of entrepreneurship, Sarasvathy (2001b) presented the main four principles, which separate effectuation from other presented models, like causation models. These four principles are as follows. Firstly, effectuation predetermine how much financial loss is affordable in a certain selection of business venture selection. Contrary to effectuation model, causation model focuses on maximizing potential returns in selecting the strategy. Secondly, effectuation emphasizes strategic alliances and pre-commitments from stakeholders to reduce or eliminate uncertainty. Thirdly, exploitation of contingencies rather than



exploitation of pre-existing knowledge is a key for utilizing unexpectedly rising opportunities. Fourthly and finally, the way how to manage uncertain future prospects in effectuation is to control the unpredictable future rather than to predict it to survive among the unseen future actions. The future is not predicted, but controlled, as stated by Sarasvathy, “to the extent that we can control the future, we do not need to predict it” (Sarasvathy, 2001b, p. 251).

Effectual logic can be defined also as an internal process in human mind. It happens “in mind of an individual, where it provides a way of thinking about making decisions when non-predictive control is required” (Society for Effectual Actions, 2018). The effectual cycle can be understood to be a thinking process used in creating products, markets, and ventures. It’s not simply a dogmatic do this, do that, type set of rules. It is rather a set of heuristics that distinctively and commonly are used towards challenges that entrepreneurs normally face. This internal process can be understood also as a process of intentions to go forward step by step learning from the previous steps before entering towards the next one (Valliere, 2017). Especially, in the context of forthcoming entrepreneurs, in the start-up pre-phase, entrepreneurs may examine their own state using effectual decision-making processes. They may assess their financial position to estimate possible losses in their new ventures, take the step forward, re-evaluate their desires, toil towards the next step, and proceed towards their new business. Hence, the process is not irreversible process without possibility to adjust it all the way (Valliere, 2017).

There are five principles for the effectuation logic (Sarasvathy, Kumar, York, & Bhagavatula, 2014; Sarasvathy, 2009; Society for Effectual Actions, 2018). These five principles are introduced next based on the structures of the web-pages of Society for Effectual Actions (Society for Effectual Actions, 2018). Firstly, there is a principle of a bird in hand, denoting start with your means. When entrepreneurs are planning to start a new venture, they start with their existing means: who I am, what I know, and whom I know. After that, the entrepreneurs imagine all possible choices for their new businesses that would be possible using those means. The contrast with the causal logic is that entrepreneurs using causal logic first set the goals and after that they select appropriate means to reach those goals. There are suggestions in the literature that means-driven companies perform better, because they are able to proficiently and fluently adjust their business processes to ever changing customer needs (Blank, 2013).

Secondly, there is a principle of an affordable loss, denoting focus on the downside risk. According to this principle, entrepreneurs limit their risk by assessing the loss they can afford in each step. In this, the difference to the causal reasoning is that entrepreneurs using causal logic set the targets for return first, and then work to minimize the risks impeding to achieve those targets. Companies operating with an emphasis on affordable loss may improve venture performance by low-costs solutions by putting an upper limit for losses and by doing this, they can limit their operating costs and then increase their efficiency (Dew, Read, Sarasvathy, & Wiltbank, 2009).

Thirdly, there is a principle of lemonade, leverage contingencies. Rather than making what-if -scenarios to handle, or avoiding worst-case scenarios, effectual entrepreneurs start planning new prospective business possibilities in situations of surprising bad news, and not to avoid or overcome them. This is denoted also in other words by the author of the effectuation theory advising you to make lemonade if you have lemons. (Sarasvathy, 2009). Here the distinction to the causal logic is that entrepreneurs using causal logic try to avoid surprises which may cause unexpected results.

Fourthly, there is a principle of patchwork quilt, form partnerships. By gaining pre-commitments from key partners and stakeholders, entrepreneurs are able to reduce uncertainty in their future forthcoming new business, and at the same time are able to create new market for their products and services with interested parties. The dissimilarity with the causal logic here is that entrepreneurs using causal logic consider competitors as contenders that should be vanquished.

Fifthly and finally, according to the principle of pilot-in-the-plane, control versus predict, entrepreneurs have possibility to enter to their desired outcome by focusing on activities which are under their own control, rather than by trying to predict all possible scenarios to happen. In this principle, the contrast with the causal logic is that entrepreneurs using causal logic accepts the ideology that the trends and market forces in the market are inevitable and those are forming the future.

Recently, effectuation logic, partly tied together with causation logic which is still considered as a dominant logic, has been studied in a variety of contexts in entrepreneurial research. As the state of effectuation research can no longer be classified as nascent (Matalamäki, 2017; Perry, Chandler, & Markova, 2012) but could be classified getting closer to an intermediate state of development, more and more deductive theory-testing studies have been accomplished. Those include investigating effects of entrepreneurial behaviors on business model innovation and venture performance (Futterer, Schmidt, & Heidenreich, 2018), investigating experience, skills and knowledge as antecedents to effectuation and causation (Schmidt & Heidenreich, 2018), investigating effectuation and causation in science-based new venture creation (Villani et al., 2018), investigating effectuation, exploratory learning and new venture performance in China (Cai et al., 2017), investigating causation and effectuation behavior of Ethiopian entrepreneurs and implications on performance of small tourism firms (Eyana et al., 2017), and investigating the interaction effects between causation and effectuation on firm performance (Smolka et al., 2016; Yu, Tao, Tao, Xia, & Li, 2017).

However, effectuation logic as a theory is not accepted in academy without criticism. There are still diverging opinions on effectuation theory. There has been a long lasting and exhaustive debate between the confluent advocate group and differentiated group about the perspectives of the effectuation theory as a theory. The differentiating group claims that effectuation theory remains ineffectual and is difficult to test using an

independent frameworks (Arend, Sarooghi, & Burkemper, 2015), while the defending advocate group has been trying to revoke the allegations of the differentiating group (Dew, Read, Sarasvathy, & Wiltbank, 2016). As suggested by Matalamäki (2017), this debate between those two groups could help the theory to become more mature by stimulating researchers to contribute to it with empirical processes and studies.

Both causation and effectuation can coexist in everyday decision making because they differ in their focuses. Causation process relies on known resources and plans and therefore the scope is also more internal and is primarily restricted to available resources. As seen above, effectuation process takes the means as given and relies on selecting between possible effects that can be created with that set of means using non-predictive control. Suitable paths to go forward are based on contingencies which allow to change direction of strategies when necessary (Lemos & Andreassi, 2015). Moreover, not only in entrepreneurial research but in entrepreneurial teaching as well, effectuation thinking has been proposed to be used together with causation thinking. Effectuation type of experiential exercises combined systematically with a causation type of knowledge delivery would enlarge the learning process of the entrepreneurship students towards more comprehensive learning (Mäkimurto-Koivumaa & Puhakka, 2013).

How the selection then happens between effectuation and causation logics in everyday work of entrepreneurs? Read and Sarasvathy (2005) suggested that entrepreneur's own experience, including entrepreneurial and international experience, and company's resources are the dimensions which solve this issue. However, it has been suggested quite recently, that using causal processes in new venture creation is not necessarily related to the prior entrepreneurial experience of an entrepreneur (Villani et al., 2018). They argue, based on the study among science-based start-ups, that science-based new ventures tend to utilize more causal logic than non-science-based new ventures and is associated to the success of the start-up. These two disharmonious arguments lead to one main propositions of the current research that prior entrepreneurial and international experience has an effect on the preferred use of either, or both, of the logics.

## **2.2 Prior entrepreneurial experience of habitual entrepreneurs**

In order to better understand the effect of prior experience on the foundation processes of new ventures, and how this happens, three entrepreneurial learning concepts in entrepreneurship research are introduced in this chapter. Those theories are entrepreneurial learning (EL), experiential learning theory (ELT), and concepts of intuitive and sensing learning.

In the current entrepreneurial research literature entrepreneurs have been classified based on their prior entrepreneurial experience, into two main categories, namely novice and habitual entrepreneurs. Habitual entrepreneurs

have been sub-divided further into two categories, serial and portfolio entrepreneurs (Plehn-Dujowich, 2010; Ucbasaran, Alsos, Westhead, & Wright, 2008). According to this apportionment, novice entrepreneurs are individuals who now own, or have purchased minority or majority equity stake in independent business, and who have no prior minority nor majority business ownership experience either as a founder or purchaser. Habitual entrepreneurs are individuals who hold, or have held a minority or majority equity stake in two or more businesses, and one of these has been established or purchased. More precisely, habitual entrepreneurs can be divided into two sub-categories, serial and portfolio entrepreneurs. Habitual entrepreneurs' sub-category serial entrepreneurs includes individuals who currently have minority or majority ownership in one independent business, and have sold or closed at least one business which they had a minority or majority ownership in. Portfolio entrepreneurs are individuals who currently have minority or majority ownership stakes in two or more independent businesses (Ucbasaran et al., 2008). Globally, prevalence of habitual entrepreneurship has been discovered to be on high level. For example, in USA the proportion may be up to 64 percent, in Great Britain up to 52 percent, Australia up to 49 percent, and in Norway 47 percent of all entrepreneurs (Ucbasaran et al., 2008). In Finland, the share of habitual entrepreneurs has not been estimated to be that high. Recently, circa more than one third of all entrepreneurs have been classified as habitual entrepreneurs, and 24 percent of all entrepreneurs classified as portfolio entrepreneur, and 13 percent as serial entrepreneurs, respectively (Elinkeinoelämän Keskusliitto & Nordea, 2013).

The importance of the habitual entrepreneurs, and more specifically, importance of serial entrepreneurs, is emphasized by the research results. Those results suggest that new ventures founded by serial entrepreneurs are equally or more likely to survive and perform better than those founded by novice entrepreneurs (Plehn-Dujowich, 2010). Moreover, entrepreneur does not need to remain in the same industry in a new venture as in the previous one as benefits are suggested to be transferable between different ventures regardless of industry. However, there are suggestions from the entrepreneurship research that benefits of serial venturing are temporary. Even though serial entrepreneur's performance in one venture seems to improve his or her performance in the following ventures, this positive effect is totally spent during the life time of the next venture. This deterioration is accelerating as the time gap between ventures lengthens (Parker, 2013).

These conclusions about the benefits of serial entrepreneurs raise a question on what type of expertise and special knowledge entrepreneurs gain from their existing ventures to be utilized in their following ventures. Further, how this transfer of expertise and knowledge happens between different ventures and even in different industry. Recently, entrepreneurial research has indicated that entrepreneurship is an experiential learning process. According to this learning process, individuals develop and collect different stocks of information during their whole careers, and these stocks influence their

capabilities to recognize, act on, and exploit entrepreneurial opportunities (Krishna, 2018; Politis & Gabrielsson, 2005). Hence, the knowledge derived from earlier career experiences is a critical feature in finding new business opportunities and to establish new ventures.

One of the concepts offered in entrepreneurial research in this context is a concept of entrepreneurial learning (EL). EL has been suggested to be an interface between learning and entrepreneurial context (Harrison & Leitch, 2005). The key issues in EL are not only how and what entrepreneurs learn, or should learn, in exploring new entrepreneurial opportunities in new venture creation processes, but how and when this learning takes place in order to understand entrepreneurial process (Rae & Wang, 2015). EL has been described as “as a continuous process that facilitates the development of necessary knowledge for being effective in starting up and managing new ventures” (Politis, 2005, p. 180). This definition requires that the two concepts, entrepreneurial experience and entrepreneurial knowledge which are included in EL, are distinguished. Entrepreneurial experience alone is not sufficient for learning to happen, but it requires that something is done with that experience. Similarly, transformation alone cannot represent learning but there must be always some experiences to transform. The premise of the concept of entrepreneurial experience is that entrepreneur directly participates in, or at least observes of, the events related with new venture creation. The concept of entrepreneurial knowledge means the practical wisdom that is received from that specific experience. The process where the experience is transformed into knowledge is the way how entrepreneur is getting his or her benefits of earlier ventures to be tabbed into the following ventures (Politis, 2005).

Based on the review of Politis (2005) this learning-by-doing -method has been supported in several empirical studies. This method contains a great amount of activities in new venture foundation. Those include acquiring valuable contacts and partners, acquiring reliable suppliers, finding viable markets, learning to form correct type of organization for the new venture by forming on organization in the previous venture, coping with liabilities of newness, gathering the right information for decision-making, and making effective decisions about new opportunities (Politis & Gabrielsson, 2005; Politis, 2005; Shane, 2003). This part of the process creates a link to effectuation theory as this is what effectuation logic emphasizes. In circumstances, where the future is unclear and new venture’s business potential and performance are still uncertain, entrepreneur using all knowledge and capabilities he or she has gained during the working career is causation methods might be useful. However, in this process an experienced entrepreneur is utilizing the principles of effectuation logic, because “effectuation, however, would be better for exploiting contingencies that arose unexpectedly over time” (Sarasvathy, 2001b, p. 252). As a result, the more experience entrepreneur is, the more he or she sees the given opportunity desirable to be exploited than others do.

The theory of entrepreneurial learning described above rests upon the experiential learning theory (ELT). ELT has been described as a process in

which knowledge is created using transformation of experiences (Kolb, 1984). According to the premises of ELT, learning requires two dimensions, a grasp or figurative representation of experience, and then transformation of that representation. Both these dimensions are needed also in the concepts of EL described above. ELT requires four learning phases which are needed for an individual to be accomplished in consecutive order to capture learning effectively. These phases are experiencing, reflecting, thinking, and acting (Politis, 2005). ELT has been suggested to provide an explanation why entrepreneurs grasp and then transform the information in different manners, how they combine new information with their existing knowledge, and why their behaviors lead different capabilities to recognize new opportunities and exploit them (Corbett, 2005). ELT is a strong contrast to behaviorist learning theories which emphasize outcomes, routines of the human behavior (Kolb, 1984). Instead of focusing on outcomes, ELT is process oriented focusing on transforming experiences. For this reason, it has been argued to be suitable for entrepreneurship. This has been explained by saying that when behavioral theories emphasize routines and habits to achieve predefined goals in defined environments, entrepreneurship is just opposite. To survive, entrepreneurs have to learn through their experiences and find new opportunities. When transforming their experiences into knowledge, ELT allows entrepreneurs to discover new outcomes from their learning. This is what entrepreneurs are expected to do in finding new business opportunities (Shane & Venkataraman, 2000). Moreover, in teaching entrepreneurship, new teaching models emphasizing also experiential learning are gradually replacing conventional planning-oriented methods. Hence, a question arises “whether the combined pursuit of planning and action-oriented approaches may help aspiring entrepreneurs establish long-living ventures in the market” (Smolka et al., 2016, p. 2).

A one more view in trying to understand the learning process where the content of experiences is transformed into knowledge, is offered by the concepts of intuitive and sensing learning based on the fundamental work of the Swiss psychology C.G. Jung in the beginning of twentieth century. Those concepts were later operationalized in the 1980's (Myers, McCaulley, & Most, 1985). Based on this division, “sensing learning involves learning by knowing facts or details by based on external contacts through sights, sounds and physical sensations, while intuitive learning involves learning by knowing relationships of facts through discovering possibilities” (Rae & Wang, 2015, p. 27). Sensing learners are perceived concrete and practical thinkers. In the contexts of new venture creation, this may insinuate that they are more open to observe and find opportunities around them by analyzing and understanding the relationships in market circumstances. On the contrary, intuitive learners are perceived abstract thinkers. As for them, intuitive thinkers are more likely to create new opportunities based on high level conceptual thinking and discovering business possibilities. Research on experiential learning in entrepreneurship has found suggestions that changes in entrepreneurial

transformation of knowledge also would change the way how successfully new opportunities are discovered (Corbett, 2005; Corbett, 2002). Hence, based on the suggestions of Corbett (2005) it can be argued that the results indicate, based on the work of Corbett (2002), using the concepts of intuitive and sensing learning, that the more an individual's cognitive processing style moves toward intuitive learning and away from sensing, the more opportunities an individual would identify.

### **2.3 Internationalization**

For a start-up company, early internationalization can be vitally important development step in building feasible business. By becoming an international new venture (INV), a start-up may grow quicker. Some start-ups are born global (BG) companies and are international from their emergency, whereas some companies internationalize gradually, step-by-step (Ciravegna, Kuivalainen, Kundu, & Lopez, 2018). The INV company has been defined as "a business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries" (Oviatt & McDougall, 1994, p. 49). Those start-up companies are able to raise capital, manufacture, and sell products on several continents, especially in the area of advanced technology competing with their established competitors who are already global. Oviatt & McDougall (1994) have explained the phenomenon of the INV companies by integrating four necessary and sufficient elements for the existence of an INV company. Those four elements are firstly, organizational formation through internationalization of some transactions. Secondly, strong reliance on alternative governance structures for accessing resources. Thirdly, establishment of foreign location advantages, and fourthly, control over unique resources.

The internationalization and export challenges have been areas of entrepreneurship research for a long time. For example, the effect of international experience of the managers on the internationalization behavior of the SME's has been a subject of various studies (Debrulle & Maes, 2015; Fischer & Reuber, 2003; Paul, Parthasarathy, & Gupta, 2017). The way how this effect takes place and how the international experience can be used to predict the company's degree of internationalization have been the main interest of a great number of scholars. In their systematic literature review Paul et al. (2017) about internationalization and export challenges of SME's, found 211 relevant peer reviewed articles between 2011-2016, and 32 articles between 2011-2016 alone. Their figures during those years indicated an increasing interest in this research area. As an example of a current way to utilize the INV phenomenon in the context of the contemporary international business research, is the study where INV theory has been extended to cover the internationalization processes of an international digital platform provider (Ojala, Evers, & Rialp, 2018).

For the term internationalization there are several definitions, depending on the perspective. During the years it has been defined as “decisions to start exporting to a country, to establish export channels, to start a selling subsidiary, and so forth” (Johanson & Vahlne, 1977, p. 23), “the process of adapting a firm’s operations (strategy, structure, resource, etc.) to international environments” (Calof & Beamish, 1995, p. 116), and by referring to definitions of other scholars, “the process by which firms increase their awareness of both the direct as well as indirect influences of international transactions in their future, and establish and conduct transactions in other countries” (Paul et al., 2017, p. 329). Most of the definitions indicate that internationalization would need growth of accompany and increase of the business. However, as the definition of Calof & Beamish (1995) implies, internationalization may happen also via restructuring re-directing company’s strategy and re-organizing company’s product portfolio.

In common with definition of internationalization, there are several theories and models developed for the research of internationalization of SMEs. Some of the most famous and most used models are the three models including Uppsala model, network approach and born global model (Paul et al., 2017). In the following, some publications about the internationalization of SMEs are presented from the perspective of these models and theories.

Uppsala model which was originally developed for the internationalization processes of large size enterprises is used analyzing SME processes as well. It postulates that firms proceed gradually towards internationalization (Johanson & Wiedersheim - Paul, 1975; Johanson & Vahlne, 1977). The basic tenet of Uppsala model is that firms utilize psychic distance in their efforts in internationalizing process. Psychic distance is a notion of distance caused by differences in factors, such as language, culture, and political systems. According to Uppsala model firms first enter to the markets near their home country, and after getting familiarize themselves with international operations gradually start entering to physically more distant countries (Chetty et al., 2015; Paul et al., 2017). In the context of small software firms, the Uppsala model has been challenged already some time ago by the suggestions that the model does not adequately reflect the underlying factors which influence the patterns in internationalization of a company (Bell, 1995). He suggested that the internationalization of a company, especially new technology ventures, may be explained using three main concepts. Firstly, they may follow client followership method. This means that they internationalize together with their domestic clients who internationalize as result of their strategy. Secondly, companies may follow sectoral targeting method. This in turn means that companies internationalize using global niche markets. Thirdly, companies may internationalize using computer industry trends. According to this method, companies utilize centralized global markets using de facto - standards to access to compatible computer systems. Since then, these suggestions to improve the Uppsala model have started a series of improvements of that model. Recently, Schweizer et al. (2010) updated the Uppsala model to include entrepreneurial aspects by adding the



entrepreneurial capability variable to the process. Hence, this updated Uppsala model considers the entrepreneur's ability to exploit contingencies under uncertainty, and create new opportunities. Further, this updated Uppsala model was combined together with effectuation approach to contain also effectual aspects and is called Effectual Uppsala model (UE) (Sarasvathy et al., 2014). They added effectual elements into the model emphasizing networks and relationships to entrepreneurship and internationalization. The UE model posits internationalization a by-product of those entrepreneurs who leverage their current partnerships and networks to move their ventures forward. Moreover, it takes into account the uncertainty related to the environment of this type of business where the prediction rationality, in other word causal logic, does not work anymore. Hence, according to UE model, in their internationalization efforts entrepreneurs tend to utilize effectual logic including using their extant resources and relationships more efficiently, and exploiting of unexpected contingencies.

The network approach (Johanson & Vahlne, 2009) emphasizes using the information the firm can hoard over time, and establishes close relationships with its customers, suppliers, distributors, public authorities, and all market actors. Relationships are based on mutual trust and knowledge between aforementioned actors. These relationships lead to information exchange process which then leads to internationalization. Typically, SMEs rely on their network relationships due to limited resources, and for this reason SMEs differ on that strongly from multinational enterprises (Paul et al., 2017). The SME and its partners are mutually dependent. These relationships must be beneficial to both participants, otherwise they would look to form other relationships with other parties (Schweizer, Vahlne, & Johanson, 2010).

The born global model is a view of the internationalization process of the firms which internationalize straight after they are founded (Bell, 1995; Paul et al., 2017). BG firms are typically firms with some competitive advantages. These competitive advantages can be manifold. In a study among 103 Taiwanese electronics companies research results suggest that technology and managerial skills play an important role in internationalization (Shih & Wickramasekera, 2011). Their findings suggest that positive managerial perceptions and international orientation are important factors for SMEs to internationalize. Moreover, if the aim of a company is to be successful in export, it should improve the quality of products, marketing skills, and distribution network. International network relationships have been found to have an effect not only on the internationalization but also on the performance of the company (Musteen, Datta, & Butts, 2014). In their study of 169 SME entrepreneurial enterprises in the Czech Republic, they were able to find a positive relationship between CEOs' foreign experience and his or her first international venture performance. However, the relationship between the cultural distance associated with the first international venture and the performance of that venture was found negative. Furthermore, market conditions, technological achievements, worldwide networking, and entrepreneur managerial skills have

been suggested to trigger internationalization process (Rialp, Rialp, & Knight, 2005). They examined 38 studies on international new ventures and born-global start-ups. They summarize that the internationalization success of new ventures that become international at or soon after founding is activated by changed market conditions, recent technological advancements, a growth in importance of worldwide networking, and an increase in owner or entrepreneur managerial skills and capabilities. Hence, international experience and language skills combined the experience of managers to lead the firm will steer the firm abroad straight from the beginning. However, not all BG studies show the superiority of them. It has been shown quite recently (Choquette, Rask, Sala, & Schröder, 2017) that even though BGs have significantly higher turnover and employment levels as well as job growth rates, they cannot present better productivity advantage compared to firms with less or later internationalization. Moreover, they were able to have a significantly wider market reach. Based on this, it can be claimed that BGs are special in some aspects but not in all. Quite recently it has been argued that the theory and research on BG firms has remained underdeveloped and fragmented (Knight & Liesch, 2016). In their study they summarize the developments and evolution of research on early internationalization and BG firms, and propose researchers to contribute on looking for antecedents, mediators, and moderators of performance of BG firms in the future.

In addition to those three theories and model described above, there is a great number of other models and theories, like product life theory. Even though the product life theory is not widely used in SME research, but in multinational enterprises research settings, it postulates that a firm normally develops and introduces new products for their home market, collects information and feedback, and learns from product's performance, may enlarge product portfolio, and after that starts exporting, and may later venture into direct investments abroad (Vernon, 1979). Moreover, some studies on internationalization processes of SMEs have been made without any specific framework or without any connections to any models or theories (Rialp et al., 2005).

All these internationalization models and theories combined with the learning models presented earlier allow to argue that the development of the degree of internationalization of a start-up company may be triggered by and dependent of the background of the entrepreneur, like prior international experience and prior entrepreneurial experience.

## **2.4 Financial performance of new venture**

To achieve profitable business, perhaps the most popular recommendation for entrepreneurs-to-be is that they should write a business plan before they start their new ventures. The world of entrepreneurship is crowded with instructions on how to write a business plan. Writing a business plan is undoubtedly the

most widely used teaching tool in entrepreneurship education and training (Lange, Mollov, Pearlmutter, Singh, & Bygrave, 2007). This exhortation to entrepreneurs is supported by the results of the recent meta-analysis comprising 46 studies on 11046 organizations, both new and established small firms, that written business plan and planning as a process are beneficial for a profitable firm. However, contextual factors such as age of the firm and the cultural environment significantly impact on this relationship (Brinckmann, Grichnik, & Kapsa, 2010). Writing a business plan is a causal approach in new venture creation, and is generally regarded as the dominant logic (Smolka et al., 2016). By contrast, according to main principles of effectuation logic, Sarasvathy (2001b) has suggested that "The logic for using effectuation processes is: To the extent that we can control the future, we do not need to predict it" (Sarasvathy, 2001b, p. 252).

This Sarasvathy's (2001b, p. 252) suggestion was supported later by the results from a sample of 9897 new ventures indicating that effectuation was positively and significantly related to new venture performance (Read et al., 2009). After that, great number of several studies have been done to investigate the effects of effectuation on firm performance. This has happened, for instance, by investigating both direct and indirect effects of effectuation on firm performance, or by investigating the role of effectuation as a moderator or as a mediator of antecedents of the financial performance. The results of these studies have been inconsistent. Using data from 266 Chinese new ventures, Cai et al. (2017) investigated the effect of effectuation on new venture performance. Their results suggest that effectuation has a positive effect on new venture performance. In their study they used exploratory learning as a mediator between effectuation and new venture performance. Exploratory learning in new ventures is "the process of gaining new entrepreneurial knowledge which involves searching, recognizing, and understanding new knowledge beyond existing knowledge base" (Cai et al., 2017, p. 389). In their study they found that exploratory learning fully mediates effect of effectuation on the new venture performance. Similarly, the effect of effectuation has been suggested to impact via innovation to performance. Roach, Ryman & Makani (2016) used 169 American electronic product manufacturing-based SMEs in their study to investigate the role of the separate dimensions of effectuation as mediators of innovation between them and SMEs' financial performance. Effectuation dimensions included means, leverage contingencies, pre-commitments and affordable loss. Means and leverage contingencies were found to positively mediate innovation leading to increased firm performance. Affordable loss was not found to have a mediating role, but had a direct effect on firm performance (Roach, Ryman, & Makani, 2016).

Effectuation and causal logic are not exclusionary design logics but can exist together at the same time. Hence, their joint and interaction effects on the firm performance have been a subject of various studies. Using research data collected from 312 software firms in China, Yu et al. (2017) found out that causation and effectuation have contingent interaction effects on firm

performance. Causation has a positive effect on firm performance, and effectuation has a positive effect on firm performance when uncertainty is high. However, they failed to find that effectuation would have a positive effect on firm performance when uncertainty is low (Yu et al., 2017). Furthermore, based on their findings they argue that causation and effectuation may compete for a firm's scarce resources, attention and time. Additionally, they argue by giving a new explanation for the positive effects of the combined use of causation and effectuation that it may happen via a portfolio diversification function. Further, they suggest that the interaction effects between the combined use of causation and effectuation and firm performance should be examined more in future studies. Likewise, in their study using data collected on 1453 entrepreneurs in 25 countries Smolka et al.(2016) studied the main and interaction effects of effectuation and causation logic on venture performance. Based on their results they argue that ventures benefit of using these two entrepreneurial logics in tandem (Smolka et al., 2016). Specifically, they studied the interaction of causality with the four dimensions of effectuation, namely experimentation, affordable loss, pre-commitment and flexibility, each of those separately in the hierarchical ordinary least squares regression framework. They found out that effectuation is positively related to venture performance, in particular when entrepreneur applies pre-commitment and flexibility dimensions of effectual principles. According to them, "it seems intuitive that venture performance depends on the extent to which entrepreneurs are flexible, proactively pursue new opportunities, and adapt their businesses to a changing business environment"(Smolka et al., 2016, p. 19). Their findings emphasize the importance of securing pre-commitments from third parties which they see to be vital for entrepreneurs.

In comparison with the previous research results supporting the assertion of the positive effect of effectuation logic on financial performance of a firm, not all research results lend support to that assertion. Quite recently, the empirical study of Eijdenberg et al. (2017) among entrepreneurs in Burundi indicates that there is no significant difference between effectuation and causation on small business growth in terms of employees (Eijdenberg, Paas, & Masurel, 2017). They conclude their research results that small business owners using effectuation logic perceived more uncertainty than the respondents using causal logic, but also that the effects from the effectuation and causation orientations on small business growth were non-existing. Likewise, the empirical study among 118 Ethiopian tour operators revealed a varied effect of causation and effectuation on financial and non-financial indicators of the company success (Eyana et al., 2017). Causation logic was found positively related to an increase in employment size, whereas the overall effect of effectuation is positively related to financial performance measures. However, its four dimensions vary in their effects on sales, profit and assets increase. The result concludes that causation and effectuation had varying consequences on firm performance. Unlike the findings of other research results, a strong empirical support was not

found to claim that use of effectuation is superior to use of causation in explaining outcomes, such as firm performance.

The performance of a company can be measured using financial performance, non-financial performance or both (Venkatraman & Ramanujam, 1986). They proposed a framework for performance measurement approaches. The framework is two-dimensional. The first dimension encompasses financial versus non-financial measures, and the other dimension involves data source, whether they are primary or secondary sources. The profit-based financial performance, measured with the framework of Venkatraman & Ramanujam (1986), measures the short-term success of the company, whereas non-financial, in other words, operational performance, measures the overall long-term goals of the company (Chenhall & Langfield-Smith, 2007). For instance, financial performance can be examined using indicators such as sales growth, profitability and earnings per share, whereas operational performance measurement focuses on important operational success factors might lead to financial performance (Eyana et al., 2017).

The measurement of firm performance has been a critical issue in entrepreneurship research. Scholars recommend to use both financial and non-financial performance measures when the performance is measured (Chenhall & Langfield-Smith, 2007; Murphy, Trailer, & Hill, 1996). The use of combined performance measurement could possibly reduce the impact of these inoperative measures on decision-making in evaluation of the managerial and divisional performance. On the other hand, same scholars recommend that financial performance indicators, such as sales growth, net income growth, and ROI (return on investment), gross margin, and profit should not be combined to form one composite dimension, because they may reflect distinct dimensions of financial performance (Murphy et al., 1996).

## **2.5 Effectual view on internationalization**

Quite recently, scholars have suggested that in addition to classical causation theories, also effectuation theory would explain the development of the internationalization process in start-up companies (Knight & Liesch, 2016). In the context of internationalization, effectuation is based on relatively goal-free and unplanned approach to proceed in the development process of new opportunities, and emphasizes is on available means and partnerships, whereas causal approach is more formal and relies on planning and traditional methods. Hence, the Uppsala model (Johanson & Wiedersheim - Paul, 1975; Johanson & Vahlne, 1977) represents a risk avoidance process that is related to causation logic. The updated Uppsala model (Schweizer et al., 2010) and the effectual Uppsala model (UE) (Sarasvathy et al., 2014) represent the effectual and entrepreneurial approach in efforts of SMEs towards internationalization.

There are research results which indicate that experienced entrepreneurs tend to use effectuation rather than causal methods in internationalization. Harms & Schiel (2012) studied international market entry of 65 gazelle firms as an entrepreneurial process. Their results indicate that experienced entrepreneurs tend to apply effectuation rather than causation in their internationalization process. Moreover, uncertainty did not show a systematic influence on the preferred method used by the gazelle firms. Those entrepreneurs who were using causation-based international new venture creation processes tended to engage in export-type entry modes. Moreover, effectuation-based new venture creation processes did not predefine the internationalization entry mode (Harms & Schiele, 2012). In their longitudinal research in the context of BG companies Nummela et al. (2014) collected data from three software companies in Finland, Ireland and Israel and were able to identify the critical events that act as decision-making triggers. Using those events Nummela et al. (2014) were able to capture the dynamics of the post-entry international growth process. Moreover, they showed evidence for the co-existence of effectuation and causal logics in internationalization process. Their results indicate that the decision-making of BG firms was constructed of alternating periods of causation and effectuation logics. Triggers for the alternation phases included, for example, change of key persons, and the search for external funding. Hence, co-existence of the two decision-making logics is possible, due to different degrees of uncertainty in market, or multiple decision-makers involved (Nummela, Saarenketo, Jokela, & Loane, 2014). Similarly, using a multiple case study of software firms from Finland and New Zealand Chetty et al. (2015) found out that there is evidence that entrepreneurs who have existing relationships in foreign markets tend to use effectuation to select and enter foreign markets. Further, entrepreneurs during their internationalization process differentiate between foreign market selection and foreign market entry. This is due to using different decision-making processes in those processes. Entrepreneurs tend to interweave effectuation and causation logics. Moreover, uncertainty during foreign market entry is not necessarily a barrier because it can provide new opportunities depending on the logic used. (Chetty et al., 2015). These findings are in line with other research results. Based on five case-studies Kalinic, Sarasvathy & Forza (2014) found that the level of commitment in the foreign market could be rapidly increased by switching from causal to effectual logic. Moreover, the switching could assist in overcoming liabilities of outsidership resulting an increase in the level of commitment in the foreign market (Kalinic et al., 2014).

## **2.6 Research propositions**

Today, in the entrepreneurship literature there are several approaches toward decision making in the process of venture creation. Those include, among others, approaches that emphasize either pre-planning and control, and

approaches that stress flexible, adaptive, and collaborative decision making. However, there are two promising alternatives among those approaches that entrepreneurs are proposed to use in the process of new venture creation, namely causation logic and effectuation logic (Futterer et al., 2018). Hence, these two logics are the two theories lending support to, and forming the main framework for this research in hand. The process of venture creation can be characterized by the need to decide and take actions when facing uncertainty. In this uncertainty it is difficult for an entrepreneur to know how to organize new business in the new company. In these situations, the process logics how the entrepreneur then behaves, differ from each other (Reymen et al., 2015). However, these two logics are not necessarily exclusionary features, but may exist in the same venture process over time. It has been proposed that venture creation benefits from planning-based causation process when there is no uncertainty, but collaborative and flexible effectuation process is critical under uncertain circumstances, especially in technology-based ventures (Sarasvathy, 2001b).

The causation logic in venture creation has been described as cooking, based on recipes (Reymen et al., 2015). Under a causation logic, new venture creation starts by setting a goal by start-up team or an entrepreneur. This goal is set up by analyzing competition, market trends and size, and assessing competitive advantages that a team or an entrepreneur may possess. After this thorough analysis phase, the team builds a business plan how this goal will be achieved. The business plan includes ways how the resources are utilized in the most efficient way. In a causation process an entrepreneur makes rational choices based on all possible information related to his decision, and on an estimated expected value for each of the options. A great amount of the existing entrepreneurship literature has theoretical foundations in this causation approach (Reymen et al., 2015). On the other hand, according to the effectuation, effectuation logic entrepreneur or a team takes a set of available means as the starting point and focuses on working how to utilize these means toward possible effects, which could be created. This is more like cooking with the given ingredients (Sarasvathy & Dew, 2005). Originally, effectuation logic was defined as follows: "causation processes take a particular effect as given and focus on selecting between means to create that effect" (Sarasvathy, 2001b, p. 245). Causation and effectuation logics differ from each other in the way how venture teams or entrepreneurs react to unforeseeable events and market environment. Causation logic tries to execute the plan as it is, reacting negatively to the any unexpected events, and those are seen as interruptions to the carrying out the strategy plan. In contrast, effectuation logic is an adaptive process trying to efficiently leverage unexpected events for the benefit of the new venture (Chandler et al., 2011). In the situation of uncertain conditions, there is no viable way to calculate an expected return for a given action. Thus, instead of analyzing alternatives and selecting the one with the highest expected profit, entrepreneur selects alternatives. There are four factors identified in the effectuation process. The entrepreneur wants to preserve

flexibility, utilize experimentation, operate in the limits of affordable loss, and seeks ways to utilize control over the future by making and getting pre-commitments from potential suppliers, competitors, and customers (Chandler et al., 2011). In order to compare how causation and effectuation processes differ from each other, Chandler et.al (2011) have sketched four values that separate causation and effectuation approaches. Firstly, in effectuation process the focus is on short-term experiments to identify business opportunities in an unpredictable future, while in causation process the focus is on prediction of an uncertain future by defining the final objective beforehand. Secondly, in effectuation process the focus is on projects where the loss in a worst-case scenario is affordable, whereas in causation process the focus is in maximization of expected returns. Thirdly, in effectuation process the emphasis is on pre-commitments and strategic alliances to control an unpredictable future, whereas in causation process focus is on business planning and competitive analyses to predict an uncertain future. Fourthly and finally, in effectuation process environmental contingencies are exploited by remaining flexible, while in causation process pre-existing capabilities and resources are exploited. These research results encourage that effectuation and causal logics are worth investigating in technical and knowledge-based new venture environment.

As stated earlier, research on learning in entrepreneurship has found suggestions that changes in entrepreneurial transformation of knowledge also would change the way how successfully new opportunities are discovered (Corbett, 2005; Corbett, 2002). To survive, entrepreneurs have to learn through their experiences and find new opportunities. When transforming their experiences into knowledge, according to experiential learning theory (ELT) it allows entrepreneurs to discover new outcomes from their learning. This is exactly what entrepreneurs are expected to do in finding new business opportunities (Shane & Venkataraman, 2000). Hence, it can be argued that the results indicate, based on the concepts of entrepreneurial learning (EL), experiential learning theory (ELT), and intuitive and sensing learning, combined with the principles of causal and effectuation logics, that the more an individual's cognitive processing style moves toward intuitive learning (effectuative) and away from sensing (causal), the more opportunities an individual would identify.

There are research results which indicate that experienced entrepreneurs tend to use effectuation rather than causal methods in internationalization. Harms & Schiel (2012) studied international market entry of gazelle firms as an entrepreneurial process. Their results indicate that experienced entrepreneurs tend to apply effectuation rather than causation in their internationalization process. These proposals encourage investigating effects of prior entrepreneurial and international experience into on preferred use of effectuation or causal logics.

The research results suggest that ventures benefit of using effectuation in terms of financial performance. Smolka et al. (2016) found out that effectuation is positively related to venture performance, in particular when entrepreneur



applies pre-commitment and flexibility dimensions of effectual principles. According to them, “it seems intuitive that venture performance depends on the extent to which entrepreneurs are flexible, proactively pursue new opportunities, and adapt their businesses to a changing business environment” (Smolka et al., 2016, p. 19). Additionally, they studied the interaction of causality with effectuation. Their findings emphasize the importance of securing pre-commitments from third parties which they see to be vital for entrepreneurs. Not all research results support this. The study revealed a varied effect of causation and effectuation on financial and non-financial indicators of the company success (Eyana et al., 2017). Causation logic was found positively related to an increase in employment size, whereas the overall effect of effectuation was found to positively related to financial performance measures. They conclude that causation and effectuation had varying consequences on firm performance. In terms of financial performance, no support was not found to the superiority of use of effectuation compared to use of causal logic in start-up founding process. This inconsistency in research results motivates to further study the effect of effectuation and causal logics on start-up financial performance.

In the literature about effectuation researchers are encouraged to further develop, refine, and verify the theory of effectuation in different types of contexts. Especially research settings regarding effectuation and its' relations to other constructs are being encouraged to be conducted (Chandler et al., 2011; Matalamäki, 2017; Perry et al., 2012). However, regarding the KIBS companies in Finland, to the knowledge of the author of the research in hand, there are no such studies yet. Hence, this study in hand tries to fill this gap and to understand the contextual and situational facets of the effectuation theory together with causal theory, and their diverse effects on various issues in the context of new venture creation. For this purpose, the following four research propositions for the study in hand are set:

- RP1 Prior entrepreneurial experience has a stronger effect on the use of effectuation logic than on the use of causation logic in new venture creation.*
- RP2 Prior international experience has a stronger effect on the use of effectuation than on the use of causation in new venture creation.*
- RP3 Effectuation has a stronger effect than causation on the degree of internationalization of a start-up.*
- RP4 Effectuation has a stronger effect than causation on the start-up company's financial performance.*

## **2.7 Research questions**

Among many different approaches to start new ventures, effectuation and causation are two alternative approaches for starting entrepreneurs to use when

developing their new businesses (Read, Sarasvathy, Dew, Wiltbank, & Ohlsson, 2010). After the causal logic was challenged by effectuation logic, several studies have been done in trying to understand better the underlying processes in and differences between those two main logics. Effectuation and causation are often announced as opposite logics regarding decision making. However, they are not necessarily mutually exclusive, and could co-exist in different phases of the new venture creation processes (Chandler et al., 2011; Sarasvathy, 2001b; Servantie & Rispal, 2018). However, it has been suggested just recently that the studies in this area are rare and not even their co-existence has been shown in literature (Matalamäki, 2017). Some studies have proposed that effectuation would be especially used by start-up companies in highly uncertain circumstances (Maine, Soh, & Dos Santos, 2015; Reymen et al., 2015). On the other hand, it has been suggested that prior expertise may be a differentiating factor between expert and novice entrepreneurs when making decisions on the use of effectuation or causation logics in new venture creation (Dew et al., 2009). For this reason, the following first and second research questions were set:

*RQ1 To what extent does prior entrepreneurial experience of entrepreneurs effect on the decision-making processes in new venture creation?*

*RQ2 To what extent prior international experience of entrepreneurs effect on the decision-making processes in new venture creation?*

According to Rikama (2017), of all SME companies in Finland, 11 per cent were expansive companies. Typically, those SME companies were young, almost 80 per cent were founded after the year 2000 and half of expansive companies were established after 2010. For them operating in international business is much common mode of operation than among other types of companies. There are evidences that entrepreneurs who have existing relationships in foreign markets due to their experience in international experience, tend to use effectuation to select and enter international market (Chetty et al., 2015). Further, internationalization may result in better growth of the company with increasing market. For this reason, the following third research question was set:

*RQ3 To what extent does the decision-making processes of entrepreneurs influence on the degree of internationalization of start-up companies?*

KIBS companies play an important role in the modern society. Not providing only growing business and new innovations, KIBS companies offer a considerable potential for new jobs (Miles, 2003). In Finland, KIBS companies were one of the most expansive classes of all SMEs in 2015 (Rikama, 2017). More jobs are created by successful companies. Quite recently it has been suggested that the use of causation and effectuation logics has an effect, partly interactively, on company's performance (Smolka et al., 2016; Yu et al., 2017). Further, effectuation has been proposed to have a positive effect on company's performance (Cai et al., 2017; Guo et al., 2016). Hence, the fourth research question was set as follows:

*RQ4 To what extent does the decision-making processes of entrepreneurs influence on the financial performance of start-up companies?*

As a summary, because of the importance of the KIBS-companies to the future Finnish new ventures, this study tries to deepen the understanding on effectuation and causation logics, and the relationships between them and their antecedents and consequences among Finnish KIBS companies by finding the answers to the research questions presented above.

## **2.8 Selection the mixed methods research as a method type**

This research in hand is characterized as a mixed methods research utilizing sequential exploratory strategy in terms of the methods used. In order to select the most feasible method for the research in hand, several different research methods were considered. Among them, mixed methods -method was deemed the most suitable for this purpose. It combines both qualitative and quantitative approaches to perform the research actions. The selection of the research method, including references to literature, is presented in this section.

The history of mixed methods research can be dated back to the early days of social science research. By validating psychological traits using multiple data collection methods the method bias could be ruled out (Campbell & Fiske, 1959). Their work led researchers further to use triangulation with multiple data sources for uncovering more unique features from data which may have been stayed hidden with a monomethod research approach.

Mixed methods research has gained more popularity in recent years in a variety of research areas, such as social work, marketing, family science, veterans, health services research, family and medicine research, health disparities, global health, occupational therapy, music therapy, counselling, psychology, second language acquisition, sociology, psychology, family studies, etc. (Creswell, Clark, & Garrett, 2008).

Mixed methods research is a research method which combines two main stream research approaches, namely qualitative and quantitative research designs. It differs from monomethod designs not only combining two different, and traditionally even opposite designs but also by interfacing to other design practices. It is recognized by mixing, connecting, integrating, or embedding the research data from the other method to the data of the other method for a better and more comprehensive research results. The same mixing, connecting and integrating may, or should be applied also to research questions and results interpretation (Creswell, 2009).

According to (Creswell, 2009) there are six strategies which can be identified and used in designing the process for a mixed methods research. These strategies differentiate from each other for example in the way how data is collected, what is the sequence of analyses made, how and when the results are reported, how methods are interacting with each other, or are they sequential or concurrent, etc.

Three sequential designs, namely sequential explanatory design, sequential exploratory design and sequential transformative strategy, of these six strategies are briefly introduced as introduced by Creswell (2009).

Firstly, sequential explanatory design is a model where a quantitative data collection and analysis are made in the first phase of the research, and in the second phase the qualitative analysis is made building on the results of the first phase. This method has been proposed to be suitable for the research to explain and interpret unexpected quantitative results, for example relationships, by analyzing those deviances using qualitative methods in the phase two.

Secondly, sequential exploratory design is similar to the previous method except that the phases are inverted. Hence, the qualitative data collection and analysis are in the first phase which is followed by the quantitative data collection and analysis in the second phase. Second phase is based on the results of the first phase and the data are mixed by connecting the results of the first phase to the data collection and analysis of the second phase. Method can be implemented through the lens of an appropriate theoretical view. The purpose of this method is to assist to construe qualitative findings using quantitative data collection and analysis. The primary focus of this model is to explore the phenomenon in question. It is suggested that this type of method is especially suitable for testing immature theories (Morgan, 1998). Similarly, it is deemed appropriate to determine the distribution of a certain phenomenon within a chosen population. Moreover, sequential exploratory design has been proposed as a procedure to develop foundations even for a new instrument if existing instrument are not adequate (Creswell, 2009). Additionally, it is a straightforward method to design and report, and is suitable for exploring a phenomenon and enlarging qualitative findings.

Thirdly, sequential transformative strategy is a two-phase method with a theoretical lens. This lens is covering both phases and all the procedures in them. This model has an initial phase, either qualitative or quantitative, which is then followed by a second phase. This second phase can be either qualitative or quantitative and is built on the basis of the first phase. The theoretical lens can be introduced in the introduction and is steering the whole research throughout the whole process. The weight can be on either phases or can be distributed evenly on both phases. Mixing may happen by connecting the results of the first phase to the data collection and analysis of the second phase, similar to previous strategy. The fundamental aim of this type of strategy is to utilize the theory which is behind the research, rather than the use of the methods alone (Creswell, 2009). By using two phases with different research methods this strategy offers diverse perspectives to the phenomenon in question and offers possibilities to better understand the research problem. One of the strengths of the sequential transformation strategy is that it places the mixed methods research within a transformative framework. Weaknesses include the time required to accomplish both phases sequentially starting from data collection for both phases to reporting the results.

The character of this study in hand is explorative, and the aim is to find support for the relationships of effectuation and causal logics with various other dimensions in new venture creation. As seen in the literature review, the effectuation theory is at least partly still in immature phase (Arend et al., 2015; Matalamäki, 2017). Hence, finally, after several considerations, the mixed methods research model was selected as the final main method. This selection makes also triangulation possible during the process. Accordingly, based on the character of the study in hand, the selection of the strategy for the mixed methods research fell on the sequential exploratory design as it is, according to Creswell (2009), suitable for testing immature theories.

## **2.9 Research framework**

In order to accomplish all the phases of the research a research framework was created for that purpose. This framework is introduced on this section. The framework is based on the research propositions presented in earlier in this chapter, on the research questions, and on the choice of the research method selected among different types of mixed methods. The framework is presented in FIGURE 2.

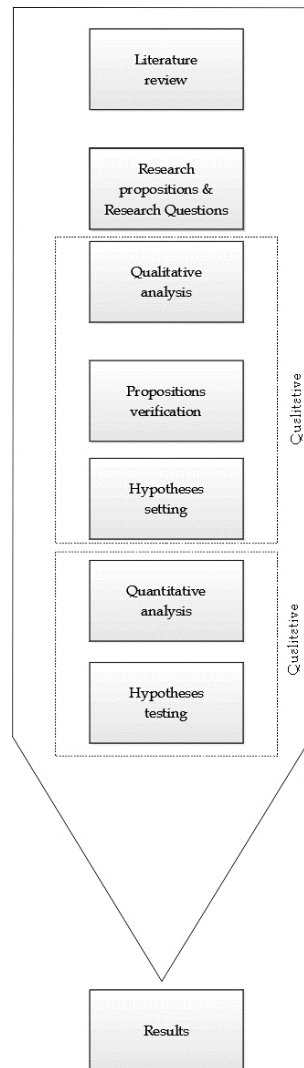


FIGURE 2 Research framework

The framework is made up of the following components. Those components follow the procedures proposed in the literature for an appropriate and valid mixed mode research designs (Creswell, 2009). According to this framework, the research starts with the literature review on relevant topics of the research area, i.e. on effectuation and causal logics on new venture creation added with relevant other theories on prior entrepreneurial and international experience, internationalization and financial performance of start-up companies. Based on the literature review, the research propositions are presented next. The propositions are based on the concepts made in prior research on effectuation and causal models in the context of new venture creation, and specifically in this research, from the point of view of Finnish KIBS -companies. After this, research questions are formulated. These two phases are followed by the qualitative analysis. The qualitative analysis is based on the recorded interviews of the sample of ten Finnish start-ups in the target area. Analysis consists of transcription of those recordings, coding, and analyzing the coded text in order

to find out the constructs residing in the processes in new venture creation. After qualitative analysis, research propositions are verified. After that, hypotheses are set for further analyses integrating these two different research methods tightly together into one, as instructed (Creswell, 2009). Hypotheses testing happens in the next part of the framework, in quantitative analysis phase using statistical methods. Finally, the results of both methods are presented, interpreted and discussed in the final phase of the research.

### 2.9.1 Qualitative analysis research model

The research model contains research definition, critical incident technique (CIT) planning, new venture representatives' interviews, transcriptions of recordings, coding, analysis of the contents of interviews, verification of the research propositions, and finally setting hypotheses for the quantitative analysis. Each of the components of the model and research actions are described in details later in the following chapter. The model for the qualitative analysis part of the research is depicted in FIGURE 3.

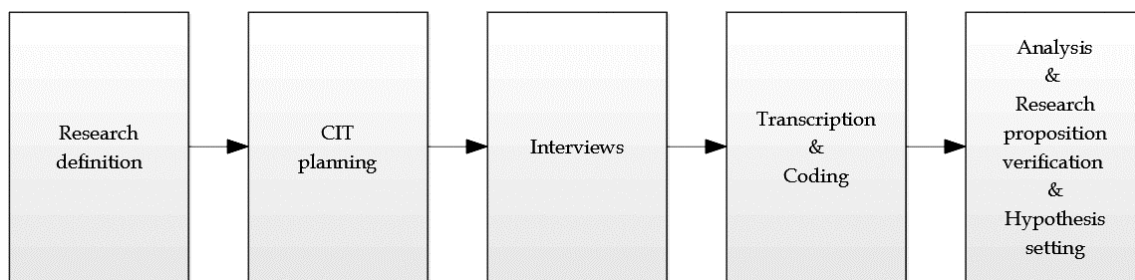


FIGURE 3 Qualitative analysis research model

### 2.9.2 Quantitative research model

The model contains the operationalization of the constructs for the questionnaire to test the hypotheses, quantitative analysis including data collection, analysis, and testing the hypotheses, and finally discussion on the results of the quantitative part of the research. Each of the components of the model and research actions are described in details later in the following chapter. The model for the quantitative research is presented in FIGURE 4.

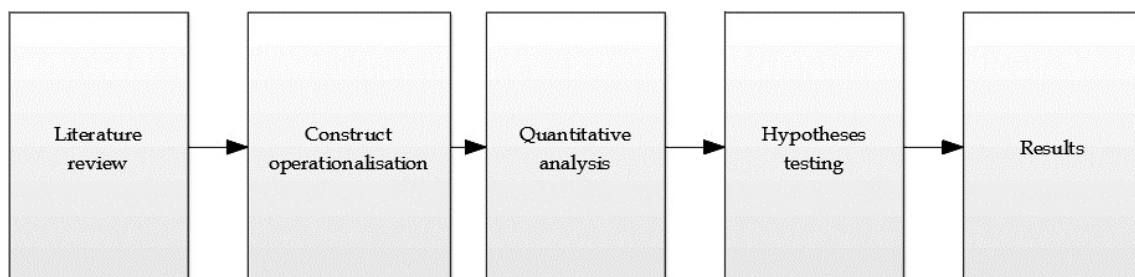


FIGURE 4 Quantitative research model

### **2.9.3 Unit of analysis**

Both in qualitative part and in quantitative part of this research the unit of analysis is the entrepreneurs him or herself. In the context of a start-up company unit of analysis is oftentimes the company because in the pre-phase there is only the founder in the company making all decisions in all incidents. When the company grows and more resources are employed the decision-making process may be escalated including more and more people. However, in spite of this, in this research the unit of analysis was the entrepreneur. Acknowledging this, the coding was consistent allowing to code the actions from a personal perspective of all informants considering the behavioral aspects of the research setting. This is compatible with the ideas of effectuation which was explained as a process in mind of an individual, as a way of thinking about making decisions (Society for Effectual Actions, 2018).

### **2.10 Summary**

This chapter contained the literature review where effectuation and causation logics including their basic concepts were discussed first. Then, some literature on prior entrepreneurial and international experience were presented and discussed followed by the literature on the aspects of start-up company's financial performance and internationalization. After that, the research propositions and research questions were set followed by the introduction research framework of the study.



### **3 METHODOLOGY, DATA COLLECTION, AND ANALYSIS OF QUALITATIVE PART**

In this chapter the research methods, data collection and data analysis of the qualitative part of this study are discussed.

The methodology which was used in the research in hand in the qualitative part is based on the model suggested by Gremler (2004). Hence, the main technique that was used, was critical incident technique (CIT). Its role was important not only in the data collection phase, but throughout the whole phase in its entirety. The process has five main phases (Gremler, 2004). These phases were followed in this study and are as follows:

- Phase1 Problem definition
- Phase2 Study design
- Phase3 Data collection
- Phase4 Data analysis and interpretation
- Phase5 Results report

The phases of the critical incident technique process, based suggestions by Gremler (2004), are depicted in FIGURE 5. In phase one, in problem definition phase, pertinent research questions were identified before any research actions. These research questions were presented earlier in paragraph 2.7. In the following phase, in study design phase, the methodology for the research was designed. The outcome of the research design was presented in the form of research framework in paragraph 2.8. Phases three and four (data collection, data analysis and interpretation) are presented in phase five (results report) in this chapter. The CIT method is described in more details next.

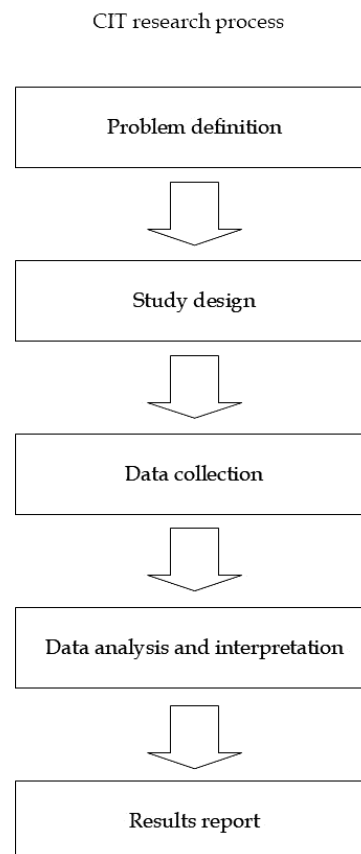


FIGURE 5 Five-stage critical incident research process

### 3.1 Critical incident technique (CIT) and its suitability for this research

Critical incident technique (CIT) is a method introduced for social sciences to collect, analyze and classify observations of human behavior (Flanagan, 1954). CIT consists of a set of procedures to collect direct observations of human behavior in such a way that facilitates their potential usefulness in problem solving and to develop psychological principles (Flanagan, 1954). In his *Psychological Bulletin* Flanagan (1954) defined the meaning of an incident to be “any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act”, and especially, an incident “must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects ” (Flanagan, 1954, p. 1). Furthermore, CIT is defined as a “procedure for gathering certain important facts concerning behavior in defined situations” (Flanagan, 1954, p. 9).

Ever since its commencement in the 1950’s, critical incident technique has been used in a variety of research types, such as human sciences, marketing,

service research, entrepreneurship, tourism, public relationships, nursing, organizational communication, healthcare, dental education, etc. (Bradbury-Jones et al., 2015; Chell & Pittaway, 1998; FitzGerald, Seale, Kerins, & McElvaney, 2008; Flanagan, 1954; Gremler, 2004; Vershinina et al., 2017). Quite recently, Vershinina et al. (2017) used CIT to study what type of logics, including effectuation and causation, expert entrepreneurs use when encountering a threat or accidents. For this reason, CIT was judged suitable also for this research in hand.

Flanagan (1954) defined a very detailed description of both the purpose of the method and processes on how is to be used. Those definitions have remained almost unchanged ever since. The critical incident technique is a qualitative interview process, in which significant occurrences are identified by the respondent him or herself. These incidents may include events, processes, issues, etc. which are seen significant by the respondent. The respondent tells in an interview how these incidents are managed, and what are the perceived outcomes of the selected resolutions or decisions. The main objective is to understand the incident from respondent's point of view taking into account several elements, like behavioral and affective sensation.

### **3.1.1 Explicit identification of the focus of the study**

As instructed by Gremler (2004), the explicit focus of the study was identified and was stated as follows. The aim of this study is to explore the effect of prior entrepreneurial and prior international experience of entrepreneur on the preferred use of either effectuation or causal logic, and what effect the applied logic has on company's financial performance and on the degree of internationalization among the Finnish start-up companies in the KIBS industry. The research is a mixed method research utilizing critical incident technique in quantitative part, and statistical methods in quantitative part. In the phase one of the study a qualitative study based on interviews of ten relevant start-up companies is carried out. In that phase the research propositions are verified and hypotheses for the phase two are set. In phase two statistical methods are used to test those hypotheses. Lastly, final results are presented, both for qualitative and quantitative phases mixing the data and results of both phases for better understanding the dynamics of start-ups and giving answers to the four research questions.

### **3.1.2 Definition of a critical incident in the research context**

According to the recommendations of Gremler (2004), the definition of critical incident in the context of new venture foundation was defined and was as follows. Critical incident technique in the context of the new venture context denotes that those incidents which were critical either in the idea phase, in pre-start-up phase, in start-up phase, and in post pre-start-up phase of the sample companies, were thoroughly described verbally by the respondents in person-to-person interviews. Respondents were original founders and co-founders of

those companies. Interviews were recorded. Respondents were asked to recall as many as possible critical incidents having had effects on business, products, human resources or financing in all phases of the start-up history. The weight was on how the issues were solved and what was the outcome in every of the decisions they had to make to be able to continue their venture. In this way critical incidents were collected with detailed information as experienced by the respondent him or herself.

By using critical incident techniques relevant information was collected on how the start-up company was able to proceed from problematic or otherwise important situations towards more stable situations.

### **3.1.3 Applicability of CIT for this research**

CIT method has been proposed to be particularly effective when it is used in the context of new concept creation, to increase knowledge about a little-known phenomenon, or in hypotheses setting. Moreover, CIT is claimed to be a competent method when studying a phenomenon or factors when it is difficult to specify all variables a priori (Gremler, 2004). All these claims are relevant in the current research in hand. Firstly, effectuation is still a new theory and is claimed to be in the middle of the battle about its ineffectual and difficult character among the theories of entrepreneurial research (Matalamäki, 2017). Secondly, both effectuation and causal logics in the context of new venture creation processes are still little-known concept in the entrepreneurship literature in Finland and suffer from the need of knowledge about the applicability of these theories in new venture creation. Thirdly, by using CIT procedure in qualitative part of this research several hypotheses are planned to be set for the quantitative testing. Hence, CIT was deemed to be the main method for the quantitative part of this research.

## **3.2 Data collection procedure and characteristics of respondents**

Data for the qualitative analysis were collected in interviews of ten KIBS Finnish start-up companies according to the following procedure. In order to have information rich companies to be interviewed, companies were selected using theory based purposeful sampling (Palinkas et al., 2015). The method means that instead of totally random sampling, the samples were selected from the list of eight hundred KIBS companies founded in Finland between years 2002-2017. Addresses and contact information of the chief executive officers (CEO), for both qualitative interviews and for quantitative questionnaire at the same time, were purchased from a commercial firm whose data is based on the official up-to-date Statistics Finland registers. Due to practical reasons, to request the willingness of attending the interview and the link to the quantitative questionnaire was sent by e-mail at the same time. The sample companies for the interviews were selected among the volunteered respondents

from different locations of the country in order to achieve a balance between different types of locations, and also between different business types. By doing this it was confirmed that respondents are from different places and business areas. Because the research method was CIT method and retrospective, it was important that respondents would remember their incidents clearly. Therefore, the years of foundation were selected to be only between 2002 – 2017.

After companies were selected, they were contacted by phone by the author to ask their willingness to attend an interview, either in phone or in face-to-face sessions. Only three companies of totally thirteen companies which were originally sampled refused finally to be interviewed. Totally ten companies were agreed to be interviewed. During the call the purpose of the upcoming interview was clarified to a participant. The interview time was scheduled with CEO's who were founders or co-founders of the selected companies. Two interviews were agreed to occur face-to-face and eight by phone. At the same time, it was agreed that the interviews would be recorded for the analysis. Respondents were asked to recall a few, from three to five critical incidents which happened during different times of the foundation process of his or her start-up starting from idea phase to the current state. They were asked to recall how they handled the incidents and what the result was.

At the time of agreed phone interview, a phone call was placed to a participant, and mutually agreed recording was started. In face-to-face interviews the interview was made in the company office and recorder was on the desk between respondent and interviewer. All interviews were made by the author of this research.

In addition, respondents were approached after the interview by e-mail again. They were asked whether they had prior entrepreneurial experience, or prior experience on international business, or both, before they started their own KIBS start-up company. This was coded using "yes", "no", or "I do not want to disclose". Similarly, they were encouraged to appraise the financial performance of their company business whether it was profitable or not using "highly profitable", "remunerative", "unprofitable", "I do not want to disclose", without exact numeric values. Apart from this, they were asked to approximate the degree of the internationalization of their company business using the scales "fully domestic", "mostly domestic", "mostly international", "fully international", and "I do not want to disclose" based on the revenue from different type of businesses. Moreover, they were asked to confirm a short description of their company to be used in this study.

Data in interview were aggregated using open discussion. As the participants had been asked earlier to recall critical incidents during their entrepreneurship career starting from the idea phase of their start-up up to the current time, they were aware of the aim and purpose of the interview. Interviewer led the discussion around the identified critical incidents to prevent the discussion to broaden outside the scope of the planned aim. There were no predefined questions, but the interviewer used his own notes to dig up as much information as possible about the actions after the incidents. All interviews

were conducted not only during normal working hours but also in the evenings and during weekends. All interviews were completed in August 2017.

After interviews were completed and recorded, all recordings were transcribed verbatim by a professional transcription company using basic transcription without respondents' gestures, facial expressions, etc. Companies were then anonymized by coding them using simple abbreviations, NV#1 (new venture number 1), NV#2, etc. up to NV#10.

Summary of the companies with industry and short description of the history is presented in TABLE 1.

TABLE 1 Company descriptions

Company ID	Industry	Description
NV #1	Precision measurements	Founded by two university students in 2003 as a result of an idea generation during the university entrepreneurship studies. Originally start-up was doing environmental measurements, today after pivoting concentrates on precise measurements using their own patented methods.
NV #2	New materials production	Founded in 2006 by three current owners working at that time in a bigger company doing new materials technology only as a secondary industry. Nowadays a big player primarily in domestic market.
NV#3	Consulting and management development	Founded in 2012 by an owner after 14 years' service in a company in energy sector.
NV#4	Occupational safety	Founded in 2003 by three school mates in environmental studies. Now after pivoting in occupational safety business.
NV#5	Accounting	Founded in 2014 after a fusion process of two companies concentrating now on digitalization-based accounting services and interim chief financial officers.
NV#6	Software development and IT consulting	Software development company founded 2011 during university studies of the owner.
NV#7	Mobile application	Mobile application company founded in 2009.
NV#8	Software	Software development company, founded in 2012, selling own product.
NV#9	Financing	Founded 2015, an independent corporate finance advisory, specializes in raising capital for growth companies from investors and lenders. Supervised by the Finnish Financial Supervision Authority (Finanssivalvonta) and is owned by 5 partners
NV#10	Business services	Founded 2004 for publishing services and business consulting (mergers & acquisitions, analysis, and research)

Characteristics of the respondents are presented in TABLE 2. Table contains sample company ID, title of respondent, respondent's age at foundation, type of interview (f2f = face to face), age of the company, information whether a company was still in operation or not, duration in interview in minutes and the date of interview.

As can be seen in TABLE 2, there were ten start-up companies in interviews. All respondents except one were chief executive officers (CEO), one being chief sales and marketing officer (CMO). All were original founders or co-founders. The mean of age at the time of the foundation of the company of respondents was 37.8 years (SD=11.8 years). Eight of the interviews were conducted by phone, and two interviews were conducted in face-to-face sessions. Nine of the respondents were men and one female. One company was not anymore in operation at the moment of the interview, all other were fully operational. The mean of age of the companies was 7.5 years (SD=4.9 years) including the company closed at the age of 3 years. The duration of interviews was between 16 and 34 minutes with a mean of 26.6 minutes.

TABLE 2 New ventures ID, respondents' title and age, interview type, age of company, status of operation, duration and date of interviews

Company ID	Title	Age	Interview Type	Age of company	Operative in 2017	Duration, minutes	Date
NV#1	CEO	24	f2f	14	yes	29	2.
NV#2	CEO	44	phone	11	yes	31	4.
NV#3	CEO	46	phone	5	yes	16	9.
NV#4	CEO	32	phone	14	yes	25	17.
NV#5	CEO	39	phone	3	yes	30	4.
NV#6	CEO	24	phone	6	yes	34	7.
NV#7	CMO	49	f2f	3*	no	19	7.
NV#8	CEO	20	phone	5	yes	28	8.
NV#9	CEO	51	phone	2	yes	25	2.
NV#10	CEO	49	phone	13	yes	29	15.

f2f = face to face, Age = foundation year, Date = day in August 2017, \* = age at closure

### 3.3 Data classification and characteristics

After all interviews were transcribed, they were analyzed using Atlas.ti software (Atlas, 2018). All transcribed texts were put under coding procedure to find and code all critical incidents, time of occurrence, and content and actions after the incident. For this coding procedure, a method suggested by Reymen et al. (2015) was used. In the first phase, the incidents were coded according to the type of content of incident using four attributes. Those attributes were business, finance, product and human resources attributes. This coding was done in order to have a clear category for the real content of the incident.

Totally forty-two critical incidents were recorded. Business related of those were twenty-four, finance related four, product related seven, and finally human resources (HR) related seven incidents. The number of incidents was not distributed evenly between companies. The mean of the number of events was 4.8 (SD= 3.6). The maximum number, eleven, was recorded for NV#4 representing 26.1 per cent share, and minimum, only one, for three companies, for NV#5, NV#8, and NV#10 representing each 2.4 per cent share of all incidents. On average, there were 0.8 (SD=0.9) critical incidents per operational year. The largest number, 3 critical incidents per year, was recorded in NV#7, and the lowest number, 0.1 critical incidents per year, was recorded in NV#10. The number of critical incidents, average amount of critical incidents per year, distribution between companies and between categories is depicted in TABLE 3.

TABLE 3 Number of critical incidents

Company ID	Critical incident amount	Critical incidents per operational year	Critical incident content type			
			Business	Finance	Product	HR
NV#1	5	0.4	4	-	-	1
NV#2	3	0.3	2	-	-	1
NV#3	8	1.6	5	2	1	-
NV#4	11	0.8	5	2	1	3
NV#5	1	0.3	1	-	-	-
NV#6	4	0.7	2	-	-	2
NV#7	6	3.0	3	-	3	-
NV#8	1	0.2	-	-	1	-
NV#9	2	1.0	1	-	1	-
NV#10	1	0.1	1	-	-	-
total	42	0.8	24	4	7	7
%			57.1	9.5	16.7	16.7

Of all incidents, twenty-four were business related representing 57.1 per cent share of all. The shares of finance, product and human resource (HR) related were four (9.5 per cent), seven (16.7 per cent) and seven (16.7 per cent) respectively.

In the following phase critical incidents were coded according to a chronological order into four time-based classes. For every critical incident, the time of occurrence was coded using four different phases of start-up creation. Those four phases were idea phase, pre-start-up phase, start-up phase and post start-up phase. Distribution of incidents in different phases is presented in TABLE 4.

Of all critical incidents, ten were in idea phase, representing 23.8 per cent share. The shares of pre-start-up phase, start-up phase, and post start-up phase were twelve (28.6 per cent), eleven (26.2 per cent), and nine (21.4 per cent).



TABLE 4 Distribution of critical incidents in different phases

Company ID	Number of Critical Incidents	Time of critical incident			
		Idea phase	Pre-start-up phase	Start-up phase	Post start-up phase
NV#1	5	2	2	-	1
NV#2	3	-	1	-	2
NV#3	8	2	2	3	1
NV#4	11	4	1	3	3
NV#5	1	-	-	1	-
NV#6	4	-	2	1	1
NV#7	6	1	2	2	1
NV#8	1	1	-	-	-
NV#9	2	-	1	1	-
NV#10	1	-	1	-	-
total	42	10	12	11	9
%		23.8	28.6	26.2	21.4

### 3.4 Coding of actions and data analysis procedures

#### 3.4.1 Coding of actions and descriptive results

Data which were collected in interviews of the companies contained all the actions which start-up entrepreneurs had taken at critical incidents. The aim of this study is to find out whether causation and effectuation logics was used at those decision-making actions. Those actions were presumed to exist based on the prior literature and research propositions. In order to refine raw data into a format of explicable material coding of that raw data was accomplished. Due to the character of the research in hand study coding was done deductively using directed content analysis (Hsieh & Shannon, 2005; Krippendorff, 2012; Po-An Hsieh & Wang, 2007). The basic idea of the content analysis process is to organize large amounts of data into much fewer content categories, which are defined by codes. In this study all codes were based on a coding scheme having four or five predefined theoretical categories for both causation and effectuation, respectively.

Coding was based on categories developed in the literature to detect core structures. For effectuation four main dimensions were used (Dew et al., 2009; Read et al., 2009; Reymen et al., 2015) added with pilot in plane -dimension which was coded as control own activity (Society for Effectual Actions, 2018). Therefore, for effectuation the following five codes were used: affordable loss, means oriented, partnerships, leverage unexpected, and control of own activity. Similarly, for causation following four codes from existing literature (Dew et al., 2009) having developed for detecting causation were used: expected returns, goal oriented, competitive analysis, and avoid unexpected. Coding of prior

entrepreneurial experience and international experience were coded dichotomously using “yes” and “no”. Company’s degree of internationalization was coded using codes D = fully domestic, D/I = more than 50 per cent domestic, I/D = more than 50per cent international, and I = fully international. Accordingly, company’s financial performance was coded using codes H = highly profitable, P = profitable, U= unprofitable. All coding was done in Atlas.ti -software (Atlas, 2018) by a single coder, the author of this research.

Coding was accomplished according to the conventions of directed content analysis (Hsieh & Shannon, 2005). It started with careful reading of the transcript as soon as it was available and continued after that with coding the first one using the first main categories, causal and effectuation, described above. As soon as a new interview was available, the coding result of the new interview was compared to the older one in order to maintain the integrity of the coding scheme. This method was used continuously with all ten transcripts. In order to try to mitigate the effect of bias of predefined codes, all the actions which were detected not belonging any of the existing category were coded using “new dimension” -code. After all interviews were coded using two main categories, the resulting main categories were divided further into subcategories. This was done using five codes for effectuation and four codes for causal logic. In the end coding was reviewed and rechecked. Because the critical incidents were already detected and coded as described earlier, coding and categorizing of actions was done directly detecting all the actions from coded incidents by picking incidents in Atlas.ti -tool, and giving a suitable code for each action, as advised by Hsiueg & Shannon (2005). In addition to those actions which happened at critical incidents, there were a good amount of actions outside these incidents. After the original coding, two additional coding rounds were made. During these second and third round, the same attributes as before, concerning content and time of action, were connected to those actions in order to include those actions into study. By doing this, also those actions which happened outside critical incidents, were acknowledged. All ten interviews were coded similarly.

The descriptive results of the coding are presented in the following. The number of coded actions by new venture is presented in TABLE 5.

TABLE 5 Number of coded actions by company

Code	Company ID										total	percent
	NV#1	NV#2	NV#3	NV#4	NV#5	NV#6	NV#7	NV#8	NV#9	NV#10		
<b>Effectuation:</b>												
affordable loss	2	2	1	-	1	2	3	2	-	1	14	6.6
means oriented	8	3	7	7	6	8	2	7	5	3	56	26.5
partnerships	6	3	2	2	5	5	1	3	-	-	27	12.8
leverage unexpected	5	3	1	9	4	1	-	1	5	1	30	14.2
control own activity	7	2	1	6	8	13	1	2	5	1	46	21.8
Subtotal:	28	13	12	24	24	29	7	15	15	6	173	82.0
<b>Causation:</b>												
expected returns	1	-	-	-	-	1	1	1	1	-	5	2.4
goal oriented	4	1	1	2	1	3	4	1	2	1	20	9.5
competitive analysis	1	-	-	-	-	2	-	-	-	-	3	1.4
avoid unexpected	-	1	-	2	-	1	-	3	1	2	10	4.7
Subtotal:	6	2	1	4	1	7	5	5	4	3	38	18.0
Total:	34	15	13	29	25	36	12	20	19	9	211	100.0

There were totally 211 coded actions in all ten companies. The mean of actions was 21.1 (SD= 9.4). Actions classified as effectual, totaled 173, and those classified as causal, totaled 38 respectively. The percentual share of effectuative actions was 82.0 per cent, and share of 18.0 per cent of causal actions of all actions at critical incidents of those interviewed companies. The amount of "new dimension" codes was only 14 spreading evenly across the cases, and therefore those codes were neglected in the current study, and were stored for future research. Because of the low amount of additional new codes may be an indication on that no bias of identification of relevant text had happened.

The most frequent code of all, 56 actions, representing 26.5 per cent of all coded actions, was "means oriented" denoting the first effectuation dimension, "Who I am, whom I know", describing resources and networking (Dew et al., 2009). This might already suggest that own knowledge and own personal resources play a significant role in KIBS start-up companies as suggested in literature before. Code for "control own activity" denoting "the pilot in plane" - metaphor (Society for Effectual Actions, 2018) was the second common code (46

actions, 21.8 per cent) suggesting the importance of the tendency of control, rather than predict, the future of the company's business environment. The mean of effectuate actions per company was 17.3.

For causality, the most frequent code, 20 actions, representing 9.5 per cent of all coded actions, was "goal oriented" denoting that entrepreneur was targeting to a planned target in his or her venture in terms of financial or operational measures. The second common was code "avoid unexpected" (10 actions, 4.7 per cent), denoting that entrepreneur was not willing to meet unexpected situation. Both these are indications of causal dimensions in solving issues during the operations. However, codes "expected returns" and "competitive analysis" are surprisingly infrequent in data, only 10 and 3 actions. The mean of causal actions per company was 3.8.

The cross-case variation can be explored by looking at the frequencies of the actions both for effectuation and causal decisions. All ventures used both logics with varying frequencies. By calculating the difference between the effectuate and causal actions one can judge which one of the logics ventures are more likely to use (Reymen et al., 2015). The dominant method tends to be effectuation as the difference in the number of actions is in favor of effectuation. The variation between cases is depicted in TABLE 6.

TABLE 6 Cross-case variation

Venture ID	Number of Effectuation actions	Number of Causation actions	difference
NV#1	28	6	22
NV#2	13	2	11
NV#3	12	1	11
NV#4	24	4	20
NV#5	24	1	23
NV#6	29	7	22
NV#7	7	5	2
NV#8	15	5	10
NV#9	15	4	11
NV#10	6	3	3

To find out in which phase of the start-up creation the decision actions were taken, all actions were coded with four codes according to time dependent phases. Those phases were idea phase, pre-start-up, start-up, and post-start-up phases (Clarysse & Moray, 2004). Results of the coded actions by phases are depicted in TABLE 7.

TABLE 7 Coded actions by phases of start-up

Code	Phase				total
	idea	pre-start-up	start-up	post-start-up	
<b>Effectuation:</b>					
affordable loss	-	7	5	2	14
means oriented	3	16	18	19	56
partnerships	-	3	12	12	27
leverage unexpected	3	8	2	17	30
control own activity	-	4	9	33	46
Subtotal:	6	38	46	83	173
<b>Causation:</b>					
expected returns	-	1	3	1	5
goal oriented	2	8	4	6	20
competitive analysis	-	-	-	3	3
avoid unexpected	-	3	4	3	10
Subtotal:	2	12	11	13	38
Total:	8	50	57	96	211

The table reveals that, when seen from phases perspective, majority of the coded actions, 96 actions, took place in post-pre-start phase. This can be explained by a great number of effectuation codes for “controlling own activity” (33 coded activities), in other words “a pilot in a plane”- activity. This might mean that when in the post-start-up phase, companies have survived from the start-up phase and are then interfacing the challenges of the tough business environment and have to control their own operations in order to be able to survive in business and pass the pitfalls. On the other hand, the respondents may have recalled those critical incidents which happened in the post-start-up phase better than those which have happened in earlier phases in the past. This might be an indication of possible bias in the respondents’ answers. The second frequent coded actions happened in pre-start-up and start-up-phases, 50 and 57 actions respectively. Those two fairly large numbers can be explained by the code for “means oriented” which gained the values of 16 and 18 in those two phases, and value of 19 in post-start-up phase. This suggests the indication of the existence of the first effectuation dimension, “Who I am, whom I know”, describing own resources, own knowledge and networking possibilities (Dew et al., 2009). This is rather understandable because in the context of KIBS start-up company the emphasis is on own knowledge, human capital and on existing networks (Kemppilä & Mettänen, 2003). Interesting finding is, that the total number of coded actions grow rapidly by time starting from 8 coded actions in idea phase to 96 coded actions in post-start-up phase having 50 and 57 actions in pre-start-up and start-up phases. This growth applies both to effectuative and causal actions. This is inconsistent with the findings found in literature where it is suggested that effectuation decreases over time, and causal dimension will be dominant in later stages (Reymen et al., 2015). Likewise, when examining new product innovation processes in small companies, Berends et al. (2014) suggested that

effectuation is mainly used in the early venture stages, while causation is emphasized in later stages (Berends, Jelinek, Reymen, & Stultiëns, 2014). Quite recently it has been suggested that the breakeven point, the point where total costs and total revenues of a start-up are equal, would be the time when the transition from effectual decision making to causal decision making happens (Lin, 2017). This suggests that all companies would have been below their breakeven point in all phases. This could not be verified because this information was not requested separately for each phase, only the current state. The finding of the research can be noticed also in FIGURE 6.

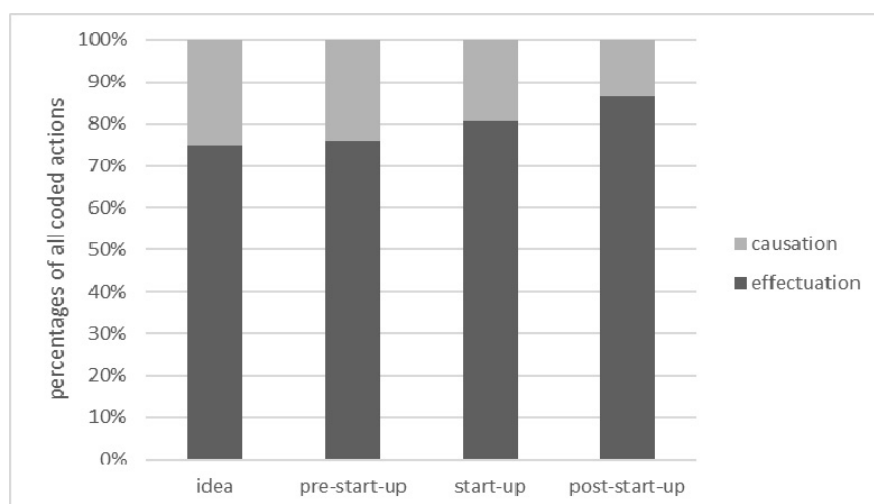


FIGURE 6 Percentages of causation and effectuation dimensions of all ventures and per phase

So as to find out what type are the actions entrepreneurs have taken when having issues to solve, all actions were coded according to four categories, namely business development, finance, product and human resources (HR). The first category, business development includes all the actions related to company business idea, customers, business development, going out of business, etc. Finance category includes all actions which relate how company was financed, own or external investments, loans, temporary arrangements, etc. Product category includes actions product and services related issues. Finally, human resources category includes all actions related to company resourcing, partners, co-founders, etc. Results of the coded actions by category are depicted in TABLE 8.

TABLE 8 Coded actions by category

Code	Category				
	business development	finance	human resources	products	total
<b>Effectuation:</b>					
affordable loss	-	14	-	-	14
means oriented	23	2	21	10	56
partnerships	16	-	5	4	25
leverage					
unexpected	11	1	4	16	32
control own					
activity	23	5	5	13	46
Subtotal	73	22	35	43	173
<b>Causation:</b>					
expected					
returns	1	4	-	-	5
goal oriented	12	4	1	3	20
competitive					
analysis	1	1	-	1	3
avoid					
unexpected	4	6	-	-	10
Subtotal	18	15	1	4	38
Total	91	37	36	47	211

The largest number of actions were in the business development category, 91 (43.1 per cent) out of 211 total coded actions. This is a comprehensible discovery; business development is an important area for start-up companies. Business development is the largest category both in effectuation and causal groups of codes, 73 and 18 codes actions, respectively. In effectuation, "means oriented" together with "control own activity" gained the largest value of 23 coded actions in business development category. Again, this might be an indication of the existence of the first effectuation dimension, "Who I am, whom I know", describing own resources, own knowledge and networking possibilities. Moreover, large number of "control own activity" is giving support to existence of effectuation in business development. The second largest result, 47 coded actions, is in the products group where the weight lies on the effectuation side of the coded actions with 43 coded actions out of 47 total actions in products group. Generally, the weight is on the effectuation side in all coded actions.

The degree of prior entrepreneurial experience and prior international experience were examined among the participants. Six of them had prior entrepreneurial experience and four did not. Accordingly, six of them had international business experience and three did not. One entrepreneur did not reveal the info about the international experience. The degree of internationalization of their start-up companies was examined. Eight of them were operating fully on domestic market, and two mostly on domestic marketing having less than half of the revenue coming from international

business. The financial performance was highly profitable in four companies, profitable in one, and unprofitable in three companies. Three companies did not reveal their financial performances.

TABLE 9 Causes and effects of causation and effectuation actions by start-up companies

Ven- ture ID	Number of Effectu- ation actions	Number of Causation actions	Prior ex- perience	Interna- tional experi- ence	Degree of Interna- tionaliza- tion *	Financial perfor- mance **
NV#1	28	6	No	No	D	-
NV#2	13	2	Yes	Yes	D	P
NV#3	12	1	Yes	Yes	D	H
NV#4	24	4	No	-	D	H
NV#5	24	1	Yes	Yes	D	P
NV#6	29	7	Yes	No	D/I	U
NV#7	7	5	No	Yes	D	-
NV#8	15	5	No	No	D	-
NV#9	15	4	Yes	Yes	D/I	H
NV#10	6	3	Yes	Yes	D	P

\* D = fully domestic, D/I = more than 50 % domestic, I/D = more than 50% interna-  
tional, I = fully international

\*\* H = highly profitable, P = profitable, U= unprofitable, - = information not available

### 3.5 Summary

In this chapter the research methods, data collection and analysis for the qualitative method used in this study were clarified. The methodology which was used in this research in the qualitative part was critical incident technique (CIT).

Then, the content analysis was performed. The outcome was coded set of actions categorized under five effectuation dimensions (means oriented, affordable loss, leverage unexpected, partnerships, and control own activity), and four causal dimensions (avoid unexpected, competitive analysis, expected returns, and goal oriented). Each of those dimensions had two additional attributes, time of occurrence (idea, pre-start-up, start-up and post start-up phase), and business function (business development, financing, product, human resources). Finally, the descriptive results of the analysis were presented and discussed.



## **4 RESULTS OF QUALITATIVE PART**

The content analysis outcome was coded set of actions categorized under five effectuation dimensions (means oriented, affordable loss, leverage unexpected, partnerships, and control own activity) and four causal dimensions (avoid unexpected, competitive analysis, expected returns, and goal oriented). Each of those dimensions had two additional attributes, time of occurrence (idea, pre-start-up, start-up and post start-up phase), and business function (business development, financing, product, human resources). In this chapter the analysis is made and results are presented and discussed. The resulting categories and their corresponding codes are presented and validated against the existing literature findings by highlighting passages from transcripts of the interviews. Finally, using statistical tests all four research propositions are successfully verified. Finally, four hypotheses are set to be tested in the quantitative part.

### **4.1 Effectuation categories**

Effectual logic is not a systematic or established set of directions to be obeyed. As defined earlier, it can also exist as an internal and unconscious process in entrepreneur's mind. Process occurs "in mind of an individual, where it provides a way of thinking about making decisions when non-predictive control is required" (Society for Effectual Actions 2017). It means the thinking process used in creating products, markets, and ventures. In the interviews of ten KIBS start-ups the founders and co-founders gave their own perceptions how they have handled critical incidents related to the business directions of their companies. In this paragraph those perceptions are covered from the point of view of the five main principles of effectuation by using verbatim excerpts from the original transcriptions of interviews. The aim of this chapter is to explore the content and meaning of interviews and illustrate the findings. All interviews were translated from the original Finnish transcriptions into English by the author of the research.

### 4.1.1 Means oriented

The first of five principles for the effectuation logic (Society for Effectual Actions, 2018) is a principle of a bird in hand, meaning, start with your means. When a prospective entrepreneur is planning to start a new venture, he or she may start with the existing means: who I am, what I know, and whom I know. After that, an entrepreneur imagines all possible choices for a new business that would be possible using those means. This principle could be identified in this research as well. This type of thinking and considering entrepreneurship based on own know-how starts in the idea phase of the new venture. This is how the founder of NV#1 recounted the idea phase of their start-up:

Well, in a way in that sense that me and my co-founder, NN<sup>1</sup> were researchers at that time when this idea appeared. And it was related to our own field of know-how, and our background is in automation technics, and our business is based on automation technics, but this is not spin-off in that sense that this was not related to any of our research projects (NV#1).

Similarly, the idea of the NV#3 appeared from founders' own experience and past careers. This was reflected by the founder of the company NV#3:

Yes, it [founding my own business] was literally a continuum in a good way and wrapped my 14 years work in energy sector where I was selling power stations, in other words I am a professional in energy sector. That period lasted 14 years, and then I was leading 7 years engineering education in the university of applied sciences, so...14 plus 7 years is not far away... And all my career in industry I got new fascinating challenges and responsibilities where there was often something challenging, and different...or let's say difficult. So, that development and to do thing in that way, not in this way has always been specific to me. That is why business development suits me quite well (NV#3).

Likewise, the co-founder of NV#7 noted the starting point of their mobile application start-up:

Well, it was my business partner [previous colleague from software development times], who had old parents in poor condition and for that reason had started to think these things, that how old people could live at home a bit safer (NV#7).

In addition to business ideas, it could be detected from research data that also the first customer prospects already in the idea phase were found by recognizing them inside own network, just like the effectuation idea postulates, Whom I know? As the founder of NV#3 explained it:

[Then]...one old mate of mine, my customer then, called me and said: "Hi, I am doing very interesting things, are you interested? I understand that you have full time job and a lot of work, but if you could consider this big challenge..." and for me it was like a punch, and that was it then, the whole shebang, just by chance (NV#3).

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<sup>1</sup> name of person anonymized

Similarly, product ideas could be found among those people close to entrepreneurs, just like in the case of NV#1:

During that feasibility study one designer just in the business area was discovered, who then joined us, more like as a mentor, and with the help of him then appeared that there is a need for this type of automated measurement system...And then he helped us to start a development project around this idea and during that development project we developed our first measurement device which is still our most important product (NV#1).

All those examples above suggest that KIBS start-up companies have elements of effectuation logic already in the idea phase. However, also in pre- and start-up phases operating in means oriented mode, rather than in goal-oriented mode, is a perceptible mode of operation. This mode could be found in the interviews in business development and product creation areas. This type of finding having the first customers for the start-up after the company was established, was recounted by the founder of NV#9:

Well...er...they were old contacts which we had already contacted earlier, and [...] well...those contacts gave us immediately new assignments. In other words, we got clients immediately (NV#9).

On the other hand, also in a later phase when the start-up is already up and running, customer-oriented way of operation and how products were found for the customers, even though nothing was ready, or not even in plans, but because founders relied on their own knowledge and know-how, was illustrated by the founder of NV#4 in the interview:

Many times our new service has been sold to the customer long before the service has been existing yet (NV#4).

KIBS start-up companies seem to rely on their own capabilities even in post-start-up phases in a stable position. This was reflected by the founder of NV#6 on the moment of thinking about the company future:

Technologies are always like those things which may bypass, but we have technical know-how, or in our company we have 50 years' experience about technology, so with that experience we have, we can do whatever and anything in our technology area. As long as there are computers there are enough to do for us (NV#6).

Similarly, utilizing modern ICT (information and communication technology) is an eminent part of the KIBS companies. Relying on own know-how is part of the whole company's human capital. This was explained by the founder of NV#4:

We have our own ICT-bud who has coded the whole system and develops and maintains it, and then our own experts generate the content for that (NV#4).

#### 4.1.2 Affordable loss

There is a principle in effectuation of an affordable loss. It means “acceptable risk related to the given means” (Sarasvathy, 2001b, p. 250). According to this principle, entrepreneurs limit their risks by evaluating the loss they can afford in each step of development. In this way they are supposed to reflect their economic capacity to the investments required. In the current study in hand the principle of affordable loss was not detected at all in the idea phase of the start-up, but it appeared at its largest in the pre-start-up phase and decreased towards the post start-up phase. The idea of affordable loss was summarized by the founder of NV#2:

Well, in fact it was made...er...in that way this thing that we started as if with finite investment and in the beginning, we worked in a way that we only offered planning service and project management service. And then we only needed minimum investments to start with and we got more and more clientele scared up, little by little (NV#2).

The risks were in some cases weighed very carefully not risking own assets. This could be seen in the narratives of the founders of NV#7 and NV#10:

Well, we thought with my business partner that we will not give any undertakings and will not let our homes be mortgaged (NV#7).

I saw that that risk was reasonably limited, and I did not have any investments on immovable property, like machinery, equipment, office, or on expensive tools etc., so the risks were very limited (NV#10).

The required investments in some cases seemed to be very small, as recalled by the founders of NV#5 and NV#8:

Yes, we needed some [money], but we could afford it by ourselves from our own pockets (NV#5).

Well, no, we have nothing, no big loans or anything else big commitments, so this has been pretty risk-free so far (NV#8).

Similarly, the founder of NV#3 explains the minimum amount of investment he had to do and could afford in order to set up a company office:

It [starting my own business] did not require any big investments. I was in fact a month or two in a room in an office hotel with minimum cost, but at a right place, then I rented a computer and started [my own business]. And started to work (NV#3).

#### 4.1.3 Leverage unexpected

The third principle is leverage contingencies or leverage unexpected. According to this, effectuated entrepreneurs start planning new prospective business possibilities in case of surprising bad news, and not to avoid or overcome them.

This is indicated by the author of the effectuation theory encouraging to make lemonade if you happen to have lemons (Sarasvathy 2009).

This principle was seen in interviews as this was the most frequent item for one specific start-up, for NV#4. This might indicate that they were able to exploit surprising situations. The customer may want something that you have no idea about at all, but as an entrepreneur willing to exploit unexpected situations you can manage this for your own good. This can be seen in a discussion with the founder of NV#4:

The first move came from a customer, they could request that [service]. In practice we had no idea at all about that, but after the request we built up that service then (NV#4).

Leveraging unexpected may also mean opportunities on personal level to set up an own company to have a good financial standing from a very beginning. This was witnessed by one of the founders of NV#9:

Well, so I ended up after two or three years together with, or initiated by the group executive that I gave up my job. And I had rather moderate golden handshake which made it possible to...withdraw... and then I thought that this might be a good phase to start up my own business (NV#9).

On the other hand, some companies saw opportunities almost everywhere by accepting all kinds of software works requested by anyone. Especially, in the pre-start-up phase this was seen one of the methods of enlarging the clientele. This was recounted by the founder of NV#6:

Well, so, in the very beginning we worked with the principle that we will make everything and anything and take compensations and money we can get (NV#6).

Similarly, enlarging the product portfolio can be done using leveraging the unexpected. This was said by the founder of NV#4 what had happened in the start-up phase of his company:

Many of our services have been sold that it was not existing until a customer has purchased it. Then it has been built using the first customer as a pilot (NV#4).

Not only in start-up phase, but also later, in post start-up phase, making the most of sudden customer requirements, appeared to help in creating new business possibilities with existing customers. This was recounted by the founder of NV#5:

Mostly the need for new services and new services arise at the customer interface when you are active there. Customers and their situations alter, and that requires new things (NV#5).

One area where new possibilities arise by coincidence for financing start-up companies are other start-up ventures who need funding from investors to finance their operations. This was also noted by the founder of NV#9:

And there is always need for funding. So...there are huge amount of ideas among companies but they have no money. And investors require new ideas, and they have money. And those need to be connected. Together (NV#9).

#### 4.1.4 Partnerships

According to the fourth principle of effectuation, form partnerships, entrepreneurs are able to decrease uncertainty in their future new business by gaining pre-commitments from key partners and stakeholders, and at the same time are able to create new market for their products and services with those interested parties. This principle was clearly communicated by the founder of NV#2:

No, we do not do everything by ourselves but we have had from the very beginning partners in strength calculations, partners, well, very small ones and specialized on what they can do well (NV#2).

Another way of utilizing partnerships is to form a common offering portfolio to deliver all required elements for the customer, as the founder of NV#1 put it:

Primarily we operate ourselves, but then there might be partners for installments, and we co-operate and collaborate [on common projects] (NV#1).

Partnership can be understood as a certain type of co-operation. Co-operation can happen on several levels. It can happen by choice, if only for exchanging views of the business. This was found out by the founder of NV#6 when joining the association of software industry.

About a year ago, we joined the NN<sup>2</sup>, the association of software developers, where there are members who are our competitors, and small Finnish and medium sized software companies, and utilizing that association I now follow quite a lot our business because the discussion there is pretty active (NV#6).

An in-depth form of partnerships may lead to arrangements in ownerships between the companies. This kind of procedure may lead to a better and closer co-operation, and in this way to have better start for a new venture. This method was witnessed by the founder of NV#8:

We won the maintenance of the old software, so we sold 20 per cent of our company to an outsider who is in fact the company of the original developer of that software (NV#8).

#### 4.1.5 Control own activity

The last sub-category of effectuation coded was the principle of pilot-in-the-plane, in other words control own activity. By definition, entrepreneurs using this reasoning are entering to their desired outcome by focusing on activities which are under their own control. They do this instead of trying to predict all

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<sup>2</sup> name of association anonymized

possible scenarios of the future. Moreover, they accept the idea that trends and market forces in the market are inevitable and those are forming the future.

Of all four phases of a start-up this dimension was the most frequent in the post start-up phase. It was used for controlling the risk to have undesired clientele, and insecure profitability as a result of it. This was explained by the founders of NV#9, and NV#6:

But now, I do not want to make any business with such companies who start complaining about our pricing, because I think that in that phase that kind of customer relationship is already doomed (NV#6).

Well, there are all sorts of [customers], but we try avoid gaming industry... and biotech, they are medicine development projects where the risks are...like playing in casino. It is zero or 100. So, we want to avoid binary results (NV#9).

By pricing you can control that if you do not want that case, so you put so high price so that the reader understand that you do not want that case (NV#6).

Controlling own activity means also that entrepreneurs were aware of their own capabilities to deliver projects in time. Because they are aware of their own resources, they will not take more cases than they can deliver properly. So, they had to control their own operations. This situation was concluded by the founder of NV#6:

We could at this very moment make so much projects as we could, but we have no chance as we cannot recruit new people to deliver new projects (NV#6).

As a summary, all five dimensions of effectuation logics were clearly found in all interviews in all phases of the interviewed KIBS start-up companies.

## 4.2 Causal categories

According to the original paper of Sarasvathy, the causal view of the future is predictive. The causal logic takes the future as a continuation of the past. Therefore, accurate prediction of the future is both necessary and useful (Sarasvathy, 2001b). The causal logic is selecting a goal first and then choosing between given means to acquire the means necessary to achieve the selected end (Dew et al., 2009). A famous example of this is causal chef who cooks from a recipe versus the other one, effectuate chef, who makes new meals from ingredients that are available.

In the interviews of ten KIBS start-ups, the founders and co-founders gave their own perceptions how they have handled critical incidents related to the business directions of their companies. In this paragraph those perceptions are covered through from the point of view of the four principles of causal thinking by using verbatim excerpts from the original transcriptions of interviews. The aim of this paragraph is to explore the content and meaning of interviews and

illustrate the findings. All interviews were translated from the original Finnish transcriptions into English by the author of the research.

#### 4.2.1 Avoid unexpected

In causal intentions, there is a clear determination to avoid unpleasant surprises. These include all surprises, both positive and negative surprises.

When business is up and running, avoiding unexpected events may become a dominant way of running the business as a continuation of a start-up phase, which may have been totally different. One way of avoiding risks is to work and invoicing only against the hours done instead of a fixed predetermined price on piecework. The founders of NV#62 and NV#2 recall this way of working:

You never know all requirements and everything what a customer wants, so we implement then what they want only on hourly basis (NV#6).

[Our work] is totally that kind of work we can invoice, which minimizes our risks (NV#2).

The work can be done also on a basis of advance payments, as was done by the founder of NV#10:

Using advance sales I received payments, we got our own salaries and funding for publishing as I had some traveling costs (NV#10).

On the other hand, avoiding unexpected is also a way to grow steadily and assuredly based on the plans. Not all start-up companies want to grow quickly, but some of those want to retain profitability and enjoy of the benefits of a small company. These ideas were recalled by the founders of NV#8 and NV#4 in this way:

Yes, we are really, how to say it, we have estimated the costs and we have really estimated with caution how our operation will grow in coming years...we have made cash flow statements, budgets, all kind of thing during these years (NV#8).

Our plan is that we do not want to grow big, we like to stay in this growth speed because this is really remunerative [business] (NV#4).

#### 4.2.2 Competitive analysis

The causal dimension competitive analysis includes "first defining the market, then selecting segments within the market through detailed competitive analyses, and then using relevant specifications and needs of the target market to determine which stakeholders to pursue and acquire" (Dew et al., 2009, p. 293). Competitive analysis is the basic element of competitive strategy, one of the fundamental strategies of causal models (Porter, 1980).



Competitive analysis is made by start-up who wants to know what is happening, not only among competitors and customers, but also what are the technology trends. This was cleared by the founder of NV#1:

We invest a lot to know what happens among our competitors, among customers but also in technical issues (NV#1).

In order to maintain own competitiveness, start-up must be aware of the competitors' price settings and the principles of operations. By performing competitive analyses, they are aware of what is the price level of competitors. As the founders of NV#6 stated:

Yes, well I know them all [competitors' prices]. And yes, we are on the same level as the smaller ones are. And compared to middle sized competitors we are a bit cheaper in terms of price setting (NV#6).

[Competitors' pricing] has had clearly effects on customers... or on clientele... so how much clientele you get depends on how much they have offered to us on our work (NV#6).

#### 4.2.3 Expected returns

In this, entrepreneurs using causal logic set the targets for return first, and then work to minimize the risks hindering to achieve those targets.

Traditional causal logic using the estimated expected returns was used to explain to investors why they should invest in a newly established start-up. This was recalled by the founders of founders of NV#9 and NV#8:

Return on investment was calculated to them [investors]...yes, yes...So how much returns they will get (NV#9).

We have made cash flow statements, budgets, everything during these years (NV#8).

Expected returns was used to justify the change in own operation mode in order to have better financial result. This was used by the co-founder of NV#7:

[We had to calculate] what it requires from us if we get, let's say 1000 new private customers, or let's say hundred private accounts versus what we need to do if we get, let's say ten big business accounts, so the productivity favored to start with business accounts [instead of private accounts] (NV#7).

The reason to establish own company instead of being employed by an employer of the moment was explained by expected returns in the future. It was clearly stated by the founder of NV#6:

I think it is a long-term investment for myself if I worked on my own account, not on some other's account (NV#6).

#### 4.2.4 Goal oriented

Entrepreneurs using causal logic set first the goals and after that they select appropriate means to reach those goals. Causal and effectual behaviors can occur simultaneously, overlapping and intertwining on different contexts of decisions and actions. Hence, goal-oriented way of operation operations could be detected in interviews even in actions which otherwise were effectual, because traditional organizations like governmental funding authorities required to make plans how to achieve set goals. This was recalled by the founder of NV#4:

In our business plan we tried to describe, and we did describe, those dreams and thoughts what the business would be, and the bank required the business plan and ...public funding...otherwise we had not made any business plans (NV#4).

Alternatively, some start-ups used this method in their everyday operations. This was seen especially among the growing phase start-ups when they systematically had decided and committed to grow. In this, samples of such companies appeared to be NV#5 and NV#6:

Yes, we did make those calculations, where we should go, what we should target at, etc (NV#5).

And yes, it [targeting at bigger customers] is according to our objectives (NV#5).

Yes, we have target to grow, and we really want to develop this to be a bigger company (NV#6).

Goal orientation was also used as a method to aim to the desired technological level in product development. This was seen in operation of NV#1:

Yes...but all the time our focus has been in totally automated system (NV#1).

As a summary, causal mode of operation, noticed by four dimensions, was detected in all interviews of the KIBS companies.

### 4.3 Co-occurrence of effectuation and causality codes

Co-occurrence of both effectuation and causation were also found in a few interviews. Both Sarasvathy (2001b) and Chandler et al. (2011) suggest that these two behaviors can occur simultaneously, overlapping and intertwining on different contexts of decisions and actions. This duality character of these two processes has been proved in several other studies (Matalamäki, 2017; Reymen et al., 2015). In the study in hand the duality could be detected in interviews when the goal-oriented way of operation was detected in actions which otherwise were effectual, because traditional organizations like governmental

funding authorities required to show evidences how to achieve set goals. This was detected with the founder of NV#3 when controlling own activity (effectual code) action co-occurred with goal oriented (causation code) action:

Our big customer run into troubles and our revenues stopped. And this was even an expected incident and we knew that this will happen, in a way or other, and I tried all that 18 months period to prepare ourselves for that to be self-directed and active, but it is, as it often is, a big customer and small micro company as a supplier against each other, and when you are fully encumbered and has to work hard and it is hard to build up a new approach (NV#3).

The owner of NV#1 explained how important it is to follow competitors and customers (causal action: competitive analysis) and at the same time to be able to find new application areas when possibilities arise (effectual action: leverage unexpected) and how to react to them (effectual action: control own activity).

You just cannot stop to think that we are doing well and everything would just continue automatically. It requires a lot of work and monitoring...just to know what happens among our competitors, among customers but also in technology. Earlier we had this cloud service example and...er..what happens in IT-technology, what happens in sensors, what sensors are available in cars, or elsewhere. And what we could do there and to apply into our business, that is an important part of business planning (NV#1).

#### 4.4 Examination of the Research Propositions

In the previous chapters the results of the qualitative part of the research were presented and discussed. Results were presented first in the form of descriptive diction, after that they were validated against the existing literature findings by highlighting passages from transcripts of the interviews. Results were presented both for effectuative and causal behaviors, and for their co-occurrence.

In the beginning of this research, based on the literature review, the following four research propositions were suggested:

- RP1 Prior entrepreneurial experience has a stronger effect on the use of effectuation logic than on the use of causation logic in new venture creation.*
- RP2 International experience has a stronger effect on the use of effectuation than on the use of causation in new venture creation.*
- RP3 Effectuation has a stronger effect than causation on the degree of internationalization of a start-up.*
- RP4 Effectuation has a stronger effect than causation on the start-up company's financial performance.*

The qualitative analysis was based on critical incident technique (CIT) to find those activities where an entrepreneur has to make decisions about the start-up

directions and business possibilities. After those incidents were found in interviews and coded, both effectual and causal actions were looked for and coded into categories and sub-categories. Coding was based on the existing literature on effectuation and causal logic. In this way totally 211 actions were found and coded of which 173 were rated as effectual and 38 as causal. Finally, those findings were validated against literature using excerpts from interviews to compare those to coded category definitions.

In order to test whether the difference between the numbers of the actions of effectuative actions (173) and causative actions (38) was caused by chance or by the behavior of respondents, a binomial test was performed. The result ( $z = 9.22494$ ,  $p = 0.000$ ,  $N=211$ ) indicated that the difference was statistically significant suggesting that the difference was not caused by chance. Hence, the difference could be expected to be caused by the difference in behavior and actions of entrepreneurs.

Then, in order to verify the research proposition RP1 (*Prior entrepreneurial experience has a stronger effect on the use of effectuation logic than on the use of causation logic in new venture creation*), the relations between prior entrepreneurial experience and effectuation and causation were studied using contingency table. All coded effectuation and causation actions ( $N=211$ ) were taken from TABLE 9 into two categories and were then classified in two groups, "yes" and "no" groups, based on the respondents' prior entrepreneurial experience. The resulting contingency table is presented in TABLE 10.

TABLE 10 Effectuation and causation actions and their differences by prior entrepreneurial experience

Prior entrepreneurial experience	Effectuative actions	Causative actions	Total	Difference in actions
Yes	99 (84.6%)	18 (15.4%)	117 (100%)	81
No	74 (78.7%)	20 (21.3%)	94 (100%)	54

The table reveals that there was a difference in frequencies of the actions by entrepreneurs having or not prior entrepreneurial experience. Entrepreneurs having prior entrepreneurial experience used effectuative logic 99 times (84.6 per cent of total 117 actions), and 18 times (15.4 per cent) causative logic. Likewise, entrepreneurs not having prior entrepreneurial experience yielded 74 (78.7 per cent) and 20 (21.3 per cent) accordingly. The statistical significance of the percentages was tested using the method where normally distributed  $z$  - score was calculated first, and the significance of that score was tested (Metsämuuronen, 2009). The calculated  $z$ -values (for group "yes"  $z = -7.202$ ,  $p=0.000$ , and for group "no"  $z = -4.54$ ,  $p=0.000$ ) suggested that the difference of the actions between causative and effectuative logic was statistically significant in both groups.

In order to verify research proposition RP1, the statistical significance of the difference between the groups was tested using binomial test. The test statistics revealed that the difference between groups (81 actions for group

“yes”, 54 actions for group “no”) was statistically significant ( $z = 2.238$ ,  $p=0.02524$ ,  $N=135$ ). This suggested that entrepreneurs having prior entrepreneurial experience tend to take more effectual actions than causation actions. Hence, the results provided evidence to verify the research proposition RP1.

Similarly, in order to verify the research proposition RP2 (*International experience has a stronger effect on the use of effectuation than on the use of causation in new venture creation*), the relations between international experience and effectuation and causation were studied using contingency table. All coded effectuation and causation actions were taken from TABLE 9 into two categories and were then classified in two groups, “yes” and “no” groups, based on the respondents’ prior international experience. If no information was available it was left out from the contingency table ( $N=183$ ). The resulting contingency table is presented in TABLE 14.

TABLE 11 Effectuation and causation actions by international experience

International experience	Effectuation actions	Causation actions	Total	Difference in actions
Yes	77 (82.8%)	16 (17.2%)	93 (100%)	61
No	72 (80.0%)	18 (20.0%)	90 (100%)	54

The table reveals that there was a difference, albeit very small, in frequencies of the actions by entrepreneurs having or not international experience. Entrepreneurs having international experience used effectuative logic 77 times (82.8 per cent of total 93 actions), and 16 times (17.2 per cent) causative logic. Likewise, entrepreneurs not having international experience yielded 72 (80.0 per cent) and 18 (20.0 per cent) accordingly. The statistical significance of the percentages was tested using the method where normally distributed  $z$ -score was calculated and the significance of that score was tested (Metsämuuronen, 2009). The calculated  $z$ -values (for group “yes”  $z = -4.928$ ,  $p=0.000$ , and for group “no”  $z = -4.393$ ,  $p=0.000$ ) suggested that the difference of the actions between causative and effectuative logic was statistically significant in both groups. In order to verify research proposition RP2, the statistical significance of difference between the groups was tested using binomial test. The test statistics revealed that the difference between groups (61 for group “yes”, 54 for group “no”) was not statistically significant ( $z = 0.560$ ,  $p=0.288$ ,  $N=115$ ). This suggested that one cannot directly state whether entrepreneurs having international experience tend to take more effectual actions than causation actions or not. However, when the original data was examined in TABLE 9, it was found out that one company (NV#4) the information of which was not available played a very significant role in this issue. If it was in group “yes” the difference would have been significant, but if in group “no”, then the difference would have been insignificant. Therefore, because this critical information was not available, it was decided, that the difference is satisfactory for the

verification purpose of the research proposition RP2. Hence, the results provided partial support to verify the research proposition RP2.

Furthermore, in order to verify the research proposition RP3 (*Effectuation has a stronger effect than causation on the degree of internationalization of a start-up*), the relations between the degree of internationalization of the company and effectuation and causation were studied. All coded actions indicating that the company had international business, internationalization codes (I, I/D, D/I) were taken from TABLE 9 and were then classified in two groups, effectuative and causative groups, based on the respondents' coded actions (N=211) in these groups. If no information was available it was left out from the table. There were no coded actions for fully international (I), or more than 50 per cent international (I/D) business, only for more than 50 per cent domestic (D/I) which indicated that companies had at least some international business. The resulting table is presented as a TABLE 12.

TABLE 12 Companies having more than 50% domestic business by entrepreneur's effectuative and causative actions

Coded action	More than 50 % domes- tic (D/I)
Effectuative	44
Causal	11

The table reveals that there is a difference between these two groups. Start-up companies having classified as operating more than 50 per cent in domestic market, albeit having international business, too, had been using effectuation logic on 44 actions and causal logic in 11 actions. The significance of the difference in "more than 50 per cent domestic" category was tested using binomial test. The result revealed ( $z = 4.31, p=0.000$ ) that the difference between 44 and 11 actions was statistically significant at  $p < 0.001$ . This suggested that those entrepreneurs operating also in international business in their start-up companies than purely in fully domestic business, had been using more effectuation logic than causation logic. Further, this indicated that effectuation has a stronger effect on the degree of internationalization than causation. Hence, the research propositions RP3 was verified.

Finally, in order to verify the research proposition RP4 (*Effectuation has a stronger effect than causation on the start-up company's financial performance*), the relations between financial performance of the company and effectuation and causation were studied using contingency table. All coded financial performance codes (H, P and U) were taken from TABLE 9 into two categories where profitable (P) and highly profitable (H) were combined in order to have the groups large enough for the statistical test. Those values were then classified in two groups, effectuative and causative groups, based on the respondents' coded actions in these groups. If no information was available it was left out from the contingency table (N=157). The resulting contingency table is presented in TABLE 13.

TABLE 13 Company's financial performance by entrepreneur's effectuate and causative actions

Coded action	Profitable and Highly profitable (H+P)	Unprofitable (U)
Effectuative	94	36
Causal	15	12

The table reveals that there is a difference between these two groups. Start-up companies having classified as profitable or highly profitable had been using effectuation logic in 94 actions and causal logic in 15 actions. Further, start-up companies classified as unprofitable had been using effectuation in 36 actions and causal logic in 12 actions. In order to test whether these differences were statistically significant, binomial test was performed for both effectuative and causal groups. The test statistics revealed that the difference in effectuative group (94 actions in "Profitable and Highly profitable" category, 36 in "unprofitable" category) was statistically significant ( $z = 4.999$ ,  $p=0.0000$ ,  $N=130$ ). Furthermore, the test statistics revealed that the difference in causal group (15 actions in "Profitable and Highly profitable" category, and on average 12 actions in "unprofitable" category) was statistically insignificant ( $z = 0.385$ ,  $p=0.700$ ;  $N=27$ ). Further, to test whether the difference in categories was significant, binomial tests were performed. The test statistics revealed that the difference in "Profitable and Highly profitable" category (between 94 and 15 actions) was statistically significant ( $z = 7.471$ ,  $p= 0.000$ ,  $N= 109$ ). Similarly, the difference in "Unprofitable" category (36 and 12 actions) was statistically significant. ( $z = 3.320$ ,  $p=0.000$ ,  $N= 48$ ). The results suggested that entrepreneurs preferring to use effectuation actions tend to have profitable or highly profitable financial performance in their companies. Hence, the research proposition RP4 was verified.

The statistical tests performed with the results from the qualitative analysis added evidence that allowed to lend support to research propositions RP1, RP3, and RP4, and at least partial support to RP2.

#### 4.5 Hypotheses setting

The research literature on entrepreneurship has been encouraging to study the antecedents of effectuation and causation logics (Perry et al., 2012). Researchers have tried to find out theoretical models according to which entrepreneurs, or potential start-up people, behave in front of new challenges, like setting up a new business venture. The differences between the behaviors of entrepreneurs either having prior experience or not has been a subject of research in a variety of research settings (Harms & Schiele, 2012; Long, Zi-yao Xia, & Wang-bin Hu, 2017; Maine et al., 2015; Wiltbank, Read, Dew, & Sarasvathy, 2009). They

suggest that experienced entrepreneurs tend to apply effectuation rather than causation in their actions. However, there are also totally opposite research results about the effect of the prior entrepreneurial experience on the use of either effectuation, causative, or any other logics in business decision making. Quite recently, based on a case study regarding 22 ventures, it has been suggested that the more entrepreneurial experience is accumulated the less they use effectuation (Hindle & Senderovitz, 2010). These contradictions between the existing research results combined with the verified research propositions of this research offer a good motivation to research that inconsistency closer in the Finnish context. This is formulated in the form of the first hypothesis:

*H1 Prior entrepreneurial experience tends to guide entrepreneurs to use effectuation rather than causation.*

Quite recently, studies suggest, supporting the current conviction, that effectuation has a positive effect of new venture's performance in unclear circumstances where the company outlook cannot be seen in advance. Using data from Chinese new ventures, the research results show that effectuation has a positive effect on new venture performance (Cai et al., 2017; Yu et al., 2017). Further, Ye et al. (2017) suggest effectuation has a positive effect on firm performance, but only when uncertainty is high, and that causation has a positive effect on firm performance. They failed to find that effectuation would have a positive effect on firm performance when uncertainty is low. Moreover, there are studies claiming that effectuation would not be superior compared to causation in relation to company performance (Eyana et al., 2017). This dilemma offers the opportunity to suggest the following second hypothesis:

*H2 Effectuation rather than causation has a positive effect on the financial performance of a start-up.*

There are research results on the internationalization processes of companies suggesting that entrepreneurs having existing relationships in foreign markets and having international experience tend to utilize effectuation in selecting and entering to international business (Chetty et al., 2015; Harms & Schiele, 2012; Kalinic et al., 2014; Nummela et al., 2014). Moreover, active internationalization has been suggested to accelerate the growth of KIBS and the development of the KIBS sector as a whole (Toivonen et al., 2009). In spite of the activities in this research area, the research activities on the emergence of Finnish KIBS companies are few and far between creating a gap in the research literature. Hence, the following third and fourth hypotheses are proposed:

*H3 Prior international experience tends to guide entrepreneurs to use effectuation logic rather than causation logic.*

*H4 Effectuation rather than causation has a positive effect on the degree of internationalization of a start-up.*



## 4.6 Summary

In this chapter the analysis of qualitative part of the research was made and results were presented and discussed. The resulting categories and their corresponding codes were presented and validated against the existing literature findings by highlighting excerpts from transcripts of the interviews. Then, using statistical test all four search propositions were verified. Finally, four hypotheses were set to be tested in the quantitative part.

In the following chapter the methodology, data collection and analysis of the quantitative part are presented.

## 5 METHODOLOGY, DATA COLLECTION, AND ANALYSIS OF QUANTITATIVE PART

This chapter includes the introduction of research model, operationalization of the constructs and control variables, sampling and data collection, and methodology clarification. Summary concludes the chapter.

### 5.1 Research model

This section describes the theoretical model that was used in the quantitative part to test the hypotheses presented in the previous chapter. The nomological network of the research model is depicted in FIGURE 7.

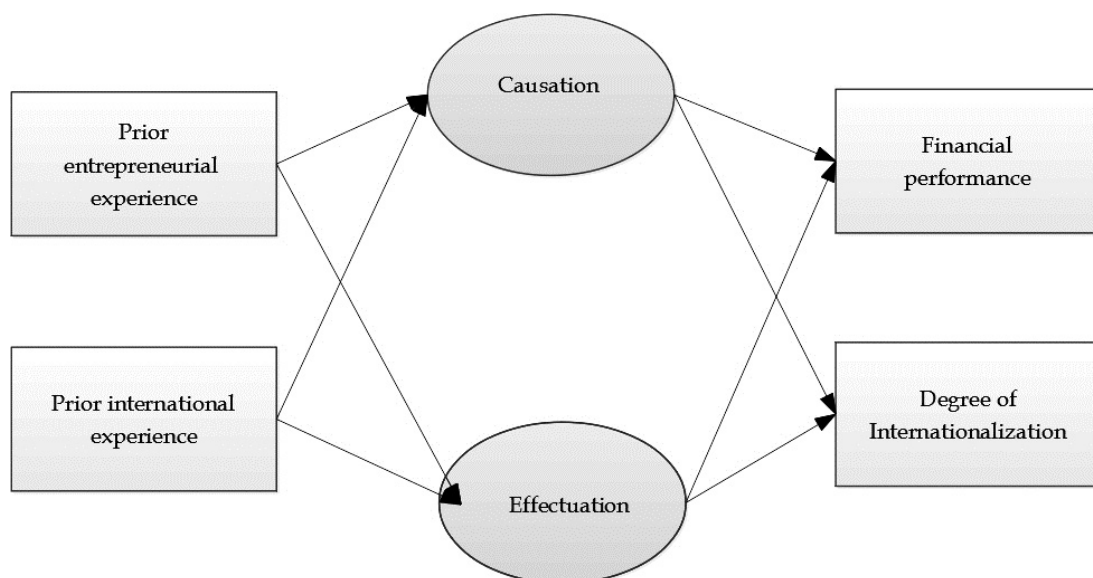


FIGURE 7 Nomological network

The research model is based on the prior literature on entrepreneurship and on various antecedents of the actors affecting on decision making processes of start-up entrepreneurs. Model was aimed to test hypotheses set in the previous chapter in order to study the effect of prior entrepreneurial and prior international experience of entrepreneur on the preferred use of either effectuation or causal logic, and what effect the applied logic has on company's financial performance and on the degree of internationalization among the Finnish start-up companies in the KIBS industry.

For the research model some presumptions were made. Firstly, it posits that causality is first order reflective construct. Secondly, effectuation was supposed to be a second order construct of type II (Jarvis, MacKenzie, & Podsakoff, 2003), or not dissimilar compared to model in panel D figure 3 (MacKenzie, Podsakoff, & Podsakoff, 2011) having reflective first order sub-constructs and formative second order constructs. Both these presumptions were based on the prior literature, among others that of Sarasvathy (2001b) and Chandler et al. (2011). Thirdly, because prior entrepreneurial experience, prior international experience, company's financial performance and degree of internationalization were among hypothesized variables, they were included in the model as endogenous and exogenous parameters.

## **5.2 Questionnaire and Operationalization of constructs**

The character of this current study is explorative, and the aim was to explore the effect of prior entrepreneurial and prior international experience of entrepreneur on the preferred use of either effectuation or causal logic, and what effect the applied logic has on company's financial performance and on the degree of internationalization among the Finnish start-up companies in the KIBS industry. Hence, factor analysis was selected as a main method which is a method to find latent variables among a large number of observed variables which are believed to reflect a smaller number of underlying variables (Brown, 2015; Suhr, 2006). Hence, by using factor analysis it is possible to test hypotheses that propose that there is a relationship between observed variables and their underlying latent constructs using measurement scales. Observed variables are obtained by collecting data from respondents of the target group.

The data for this research for testing the hypotheses were collected in a questionnaire. The questionnaire was sent to eight hundred samples of KIBS companies in Finland. Instead of totally random sampling, the samples were selected from the list of KIBS companies founded in Finland between years 2002-2017. Addresses and contact information of the chief executive officers (CEO), for both qualitative interviews and for quantitative questionnaire at the same time, were purchased from a commercial firm whose data is based on the official up-to-date Statistics Finland registers. Due to practical reasons, request the willingness to attend the questionnaire was sent by e-mail at the same time as the request to attend in interview. The measurement scales were supposed to

be reliable, consistent and valid for research purposes of an equivocal and emerging, even nascent, theories of the entrepreneurship research. Therefore, the questionnaire scales were taken from prior literature on effectuation and causal decision making. The items of the scales were originally in English, and they were translated into the Finnish language by the author of this research. After that, all items were cross-checked with native Finnish speaking research colleagues and were put under a sorting procedure of ten raters as suggested in literature (Moore & Benbasat, 1991). Finally, questionnaire was reviewed by one entrepreneur before the pilot testing with 20 start-up companies from the target group.

The scale of the questionnaire was 7-point Likert-scale. It was built in such a way that the lowest item value of the scale represented the agreement with the negative statement, whereas the highest value represented agreement with the positive statement. The questionnaire was implemented electronically using Webropol software (Webropol, 2018) and was sent to participants by e-mail with an introduction to the research and instructions how to attend.

### **5.2.1 Operationalization of the Constructs of Effectuation logic**

The constructs for effectuation logic were adopted from the study two of Chandler et al. (2011). They developed effectuation scale especially for the entrepreneurial use to be used in experimentation that captures various facets of the effectual process. The scale is multidimensional construct and is formative in nature. It has reflective indicators that are measured but they form formative dimensions of effectuation. The primary difference between reflective and formative measurement is that “while the construct causes variance in its reflective indicators, the direction of causality is reversed such that the formative indicators cause variance in the construct” (Cenfetelli & Bassellier, 2009, p. 690). There were justifiable reasons for the selection of these very scales. Firstly, Chandler et al. (2011) was the first measurement scale in trying to capture the essential dimensions and sub-dimensions of the Sarasvathy’s (2001b) original effectuation characteristics, and therefore needs continuous support for further development. Secondly, even though those scales have not been preserved from criticism, their main properties are still recognized widely, and have been widely used and cited in the current literature on entrepreneurship research.

The measurement scales for effectuation and its first order sub-dimensions were the following: experimentation (four items), affordable loss (three items), flexibility (four items), and pre-commitments (six items). They are presented in TABLE 14.

TABLE 14 Measurement scales for effectuation

Experimentation (EXP)	
EX1	We experimented with different products and/or business models.
EX2	The product/service that we now provide is essentially the same as originally conceptualized.
EX3	The product/service that we now provide is substantially different than we first imagined.
EX4	We tried a number of different approaches until we found a business model that worked.
Affordable Loss (AL)	
AL1	We were careful not to commit more resources than we could afford to lose.
AL2	We were careful not to risk more money than we were willing to lose with our initial idea.
AL3	We were careful not to risk so much money that the company would be in real trouble
Flexibility (FL)	
FL1	We allowed the business to evolve as opportunities emerged.
FL2	We adapted what we were doing to the resources we had.
FL3	We were flexible and took advantage of opportunities as they arose.
FL4	We avoided courses of action that restricted our flexibility and adaptability.
Pre-commitments (PC)	
PC1	We used a substantial number of agreements with customers, suppliers and other organizations and people to reduce the amount of uncertainty.
PC2	We used pre-commitments from customers and suppliers as often as possible.
PC3	Network contacts provided low cost resources.
PC4	By working closely with people/organizations external to our organization we have been able to greatly expand our capabilities.
PC5	We have focused on developing alliances with other people and organizations.
PC6	Our partnerships with outside organizations and people play a key role in our ability to provide our product/service.

### 5.2.2 Operationalization of the Constructs of Causation logic

The measurement scales for the causal decision making were operationalized using scales from study two from Chandler et al. (2011). The reasons for selecting this very scale were the same as above for effectuation scales. The scale was seven-item first order scale and is presented in TABLE 15.

TABLE 15 Measurement scale for causation

Causation (CA)	
CA1	We analysed long run opportunities and selected what we thought would provide the best returns.
CA2	We developed a strategy to best take advantage of resources and capabilities.
CA3	We designed and planned business strategies.
CA4	We organized and implemented control processes to make sure we met objectives.
CA5	We researched and selected target markets and did meaningful competitive analysis.
CA6	We had a clear and consistent vision for where we wanted to end up.
CA7	We designed and planned production and marketing efforts.

### 5.2.3 Operationalization of the Constructs for Financial Performance and Internationalization

In addition to the data for latent constructs, background information of the start-up company itself was collected. This included information of the financial performance of the company. Some scholars in entrepreneurship recommend that financial performance indicators, such as sales growth, net income growth, and ROI (return on investment), gross margin, and profit should not be combined to form one composite dimension, because they may reflect distinct dimensions (Murphy et al., 1996). For this reason, only one formative indicator, gross margin of the latest financial statement was operationalized to measure the financial performance of the start-up. The gross margin was requested using a six-point scale, where the steps were “negative”, “less than 5 percent”, “five to ten percent”, “ten to twenty percent”, “twenty to fifty percent”, and “more than fifty percent”. The last choice was selection for “I do not want to disclose”. Hence, the small item value indicates not so profitable business, and large values indicate good and profitable business.

The degree of internationalization was operationalized by the share the turnover between domestic and international markets measured with four-point scale respectively. The choices were “market if fully domestic”, “more than half of market is domestic”, “more than half is international”, and “market fully international”. The last choice was selection for “I do not want to disclose”. Hence, the small item value indicates mostly a domestic business, and large values indicate international business. Both values were reverse coded.

### 5.2.4 Control variables

Over and above the constructs described above, the questionnaire included attributes of the entrepreneurs and information about their start-up companies. Those attributes were needed for hypotheses testing. First of all, information about if he or she had prior experience as entrepreneur, and if he or she had experience in international business was requested. Additionally, there were

some control variables collected about the respondent him or herself, such as sex, and age the moment of founding the company, and education. Moreover, information if the commercial operation has been ended, and about the location of the start-up were asked. However, these variables were not utilized in the current research.

### 5.2.5 Operationalization of the Marker Variables

The Common Method Variance (CMV) means that part of the total variance is caused by the data collection method rather than with the variance resulting from the constructs as had been planned (Malhotra, Kim, & Patil, 2006). CMV has been suggested to be very common in self-reported surveys in which respondents fill out the questionnaire at the same point in time. CMV may cause bias in research data. In the current research marker technique was used to detect possible CMV. Marker technique is based on the use of marker variables in questionnaire (Richardson, Simmering, & Sturman, 2009; Williams, Hartman, & Cavazotte, 2010). The idea is that the CMV can be detected by comparing the change in a model fit between a model in which the loadings of the marker construct items are freely estimated to the model which they are constrained to value of zero. The marker variables must be theoretically unrelated to the real variables under examination. In the current research in hand the marker variables were taken from the analysis of the attitudes and beliefs towards hypnosis (Capafons, Cabañas, Espejo, & Cardeña, 2004). By doing this, it was believed that the marker variables are theoretically unrelated to the substantive items of the research. The variables were coded similar to all other items using seven-point Likert-scale. Marker variables were the following four items:

- C1 *Hypnosis may be very helpful to others*
- C10 *Hypnosis can be of great assistance in a psychological treatment.*
- C12 *Hypnosis is a complement or tool to help psychological therapies.*
- C22 *Hypnosis makes therapeutic results easier*

### 5.2.6 Sampling and Data collection

The samples were taken from the list of the Finnish KIBS companies founded between 2002-2017. Addresses and contact information of chief executive officers (CEO) were purchased from a commercial firm whose data is based on the official up-to-date Statistics Finland registers (Statistics Finland, 2017). It was important that respondents would remember their decisions clearly. Therefore, the years of foundation were selected to be only between 2002–2017. However, in the instructions, in case of serial entrepreneur, a respondent was asked to select only one of his or her start-up companies, and therefore there were six companies which were older than founded the year 2002. The categories of KIBS companies used in the research according to the Standard Industrial Classification are listed in Appendix 1.

Data were collected electronically and the link to the questionnaire was sent to respondents by e-mail. Totally eight hundred requests to attend were sent. The e-mail included introductory text about the purpose of the study, contact information of the author and the supervisor of this research, and the link to the questionnaire. After the query had been open for a three weeks' time, a reminder was sent to those people who had not responded. Another reminder e-mail was sent again after another three weeks' time. Finally, one hundred and twelve responses were received.

The age at the time of start-up foundation ranged from twenty to sixty-four years. The mean of age was 40.15 years, median 40.0 and mode 45 years. The demographic characteristics of the respondents are presented in TABLE 16.

TABLE 16 Demographic characteristics of respondents

	N		Mean	Median	Mode	Standard deviation
	Valid	Missing				
Age at start-up	112	0	40.15	40.0	45	10.28

The share between the genders among respondents was highly male oriented as 85.7 percent (N= 95) were male, and 13.4 percent female (N=15) whereas 0.9 percent (N=1) did not want to disclose the gender. The frequencies and percentages of the gender of the respondents are presented in TABLE 17.

TABLE 17 Frequencies and percentages of gender of respondents

Gender	Frequency	Percentage	Valid percentage
Male	96	85.7	85.7
Female	15	13.4	13.4
Missing	1	0.90	0.90
Total	112	100.0	100.0

The education of respondents was asked based on the Finnish school system. Most of the respondents, 49.1 per cent (N=55) had a master's or PhD education. Of the respondents, 28.6 per cent (N=32) had a polytechnics or upper polytechnics level education, and 10.7 per cent (N=12) had a vocational level education. High school was an education level among 4.5 per cent (N=5) of the respondents, and secondary school degree among 2.7 percent (N=3) of the respondents. Other education got the share of 4.5 percent (N=5) of the respondents. The frequencies and percentages of the education of respondents are presented in TABLE 18.



TABLE 18 Frequencies and percentages of education of respondents

Education	Frequency	Percentage	Valid Percentage
Secondary school	3	2.7	2.7
High school	5	4.5	4.5
Vocational school	12	10.7	10.7
Polytechnics/Upper polytechnics	32	28.6	28.6
Master's/PhD degree	55	49.1	49.1
Other	5	4.5	4.5
Total	112	100.0	100.0
Missing	0	0.0	

Of all respondents, 55.4 per cent (N=62) had prior experience as an entrepreneur, or as a serial entrepreneur prior establishing the start-up in question, whereas 44.6 per cent (N=50) did not. Summary of the frequencies of the respondents having previous experience as entrepreneur is presented in TABLE 19.

TABLE 19 Prior experience as entrepreneur

Prior experience as entrepreneur	Frequency	Percentage	Valid percentage
Yes	62	55.4	55.4
No	50	44.6	44.6
Missing	0	0	0
Total	112	100.0	100.0

Of all respondents, 57.1 per cent (N=64) had prior international experience in their career before establishing the start-up in question, whereas 42.9 per cent (N=48) did not. Summary of the frequencies of respondents having prior international experience is presented in TABLE 20.

TABLE 20 Prior international experience

Prior international experience	Frequency	Percentage	Valid percentage
Yes	64	57.1	57.1
No	48	42.9	42.9
Missing	0	0	0
Total	112	100.0	100.0

The gross margins of the start-up companies are presented in TABLE 21. Table reveals that gross margins were almost equally distributed between categories. It was negative in 9 companies (8.0 per cent). Further, 22 companies (19.6 per cent) had gross margin less than 5 per cent, 18 companies (16.1 per cent) between 5-10 per cent, 17 companies (15.2 per cent) between 10-20 per cent, 14 companies (12.5 per cent) between 20-50 per cent, and 16 companies (14.3 per cent) had gross margin above 50 per cent respectively. 16 companies (14.3 per cent) out of totally 112 companies did not want to reveal their gross margin percentage.

TABLE 21 Gross margins of the start-up companies

Gross margin	Frequency	Percentage	Valid percentage
Negative	9	8.0	9.4
< 5 %	22	19.6	22.9
5-10 %	18	16.1	18.8
10-20 %	17	15.2	17.7
20-50 %	14	12.5	14.6
> 50%	16	14.3	16.7
Missing	16	14.3	-
Total	112	100.0	100.0

The degree of internationalization of the start-up companies is presented in TABLE 22.

TABLE 22 Degree of internationalization of start-up companies

Degree of internationalization	Frequency	Percentage	Valid percentage
Totally international	3	2.7	2.7
> 50 % international	9	8.0	8.0
> 50 % domestic	32	28.6	28.6
Totally domestic	68	60.7	60.7
Missing	0	0	0
Total	112	100.0	100.0

The table reveals that most the companies, 68 companies (60.7 per cent) were operating totally in domestic market. Further, 32 companies (28.6 per cent) were mostly (>50 per cent) in domestic market, 9 companies (8.0 per cent) mostly in international market (>50 per cent), and 3 (2.7 per cent) totally in international market.

The information about the background of the responding companies reveals that the most common class was class number 62, "computer programming", consultancy and related activities having share of 25.9 percent (N=29). The second largest class was "Other" representing totally 18.8 percent (N=21) of all respondents. Thirdly largest class was number 70, "activities of head offices; management, consultancy activities", having share of 15.5 percent (N=17).

TABLE 23 Respondents according to Standard Industrial Classification

	Standard Industrial Classification	Frequency	Percentage	Valid percentage	Cumulative percentage
10	Manufacture of food products	1	0.9	0.9	0.9
28	Manufacture of machinery and equipment	4	3.6	3.6	4.5
31	Manufacture of furniture	2	1.8	1.8	6.3
33	Repair and installation of machinery and equipment	3	2.7	2.7	8.9
62	Computer programming, consultancy and related activities	29	25.9	25.9	34.8
69	Legal and accounting activities	6	5.4	5.4	40.2
70	Activities of head offices; management consultancy activities	17	15.5	15.2	55.4
71	Architectural and engineering activities	14	12.5	12.5	67.9
72	Scientific research and development	1	0.9	0.9	68.8
74	Other professional, scientific and technical activities	8	7.	7.	75.9
82	Office administrative, office support and other business support activities	4	3.6	3.6	79.5
856	Educational support activities	1	0.9	0.9	80.4
	Other	21	18.8	18.8	99.1
	Not available/not known	1	0.9	0.9	100.0
	Total	112	100.0	100.0	

The fourth largest class was number 71, Architectural and engineering activities; technical testing and analysis with the share of 12.5 percent (N=14). Summary of the classes according to Standard Industrial Classification is presented in TABLE 23.

### 5.3 Methodology of Analysis

There were several options to test the hypotheses using the research model. What was needed first, was the evidence of the existence of the constructs of effectuation and causation processes in data. For this purpose, factor analysis is one method. It is statistical research technique having two main forms, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA has traditionally been used to explore possible underlying factor structure without assumptions of the possible factor structure, whereas CFA allows a priori structure of the factors and relationships between data and those factors (Suhr, 2006). It is widely used methodology in the current research in several

areas of science for several analytical scenarios (Brown, 2015). Using CFA, or EFA based structures, it is possible to make estimations of the models using covariance-based structural equation modelling (SEM).

SEM is a comprehensive multivariate statistical methodology which is used to represent, estimate and test all relationships between the latent and observed variables (Gefen, Straub, & Boudreau, 2000). One of the benefits of using SEM is its capability to model and estimate all relationships, and test complex theories simultaneously. It is suitable especially for the studies where a researcher has a prior knowledge of the potential theory of the structures linking the observed variables together (Metsämuuronen, 2009; Sarstedt, Ringle, Smith, Reams, & Hair, 2014). CB-SEM (covariance-based SEM) as the name denotes, is based on the use of covariance matrix of the sample dataset.

Another main analysis method, variance based PLS (partial least squares path modeling) has disseminated into many disciplines, for instance it has been one of the main statistical analysis methods in information systems research (Dijkstra & Henseler, 2015). PLS is a regression method which has been lately been appraised to be suitable to explore theories, to be able to manage many problematic modeling issues, to be suitable studies with small sample size, to be suitable analysis containing formative and reflective constructs, be able to handle non normal data, etc.(Sarstedt et al., 2014). PLS has been increasingly encroached into a variety of academic disciplines. Recently, it has been called with a new name, PLS-SEM, referring it to be a corresponding variance-based SEM as CB-SEM in covariance-based analyses. However, quite recently, there is a rising criticism against some intractable problems of using solely PLS. Some scholars have suggested to stop using PLS by stating that “the findings of studies employing PLS are ambiguous at best and at worst are simply wrong, leading to the conclusion that PLS should be discontinued until the methodological problems explained in this article have been fully addressed” (Rönkkö, McIntosh, Antonakis, & Edwards, 2016, p. 10). Especially, among many other issues, Rönkkö et al. (2016, p. 22) are stating, referring PLS to be a SEM technique that “Marketing PLS as SEM not only obscures what the method actually does and implies capabilities it does not have, but also leads to omission of important analytical steps and even erroneous analyses that could be avoided if the method were simply presented as regression with scale scores”.

Quite recently a methodology integrating two beforementioned EFA and CFA methods into a new exploratory structural equation modeling (ESEM) has been introduced (Asparouhov & Muthén, 2009). ESEM tries to surmount the limitations of EFA and CFA. CFA modeling requires zero cross loadings between factors, which in many cases is an unrealistic requirement (Morin & Maiano, 2011). In practice this requirement means that each measured variable in the measurement scale is loaded only on one factor, and this may be too restrictive for multidimensional constructs, like effectuation in the current research in hand. The features of CFA, as an inherent part of SEM, allow the use of CFA to utilize several fit indices, modification indices, estimations of

measure errors, and statistical indices in the research in question. If CFA factor cross loadings are not close to zero, it may result in multicollinearity and low degree of discriminant validity. In EFA methods all cross loadings are freely estimated allowing the use of it also in studies without prior knowledge of the factor structure in data. ESEM integrates EFA in the CFA/SEM framework. This allows the use of cross loadings in the factor structures and is therefore suitable for studies having shared loadings between factors. This is the case in the current study in hand as Chandler et al. (2011) posit that effectuation may share some of its factor loadings with causality.

Finally, after several considerations, it was decided that exploratory SEM analysis (ESEM) was selected as a method for the factor analysis and SEM to test the hypotheses.

## **5.4 Summary**

In this chapter the research model, operationalization of the constructs and control variables, sampling and data collection, and methodology clarification were presented followed by summary.

In the following chapter the results of the quantitative part are presented.

## 6 RESULTS OF QUANTITATIVE PART

This chapter introduces first the descriptive results of data. Means, standardized deviations and medians are presented for all items of the measurement scales. Then, processing the outliers and data processing are presented. Then, validity assessment of the measurement scales is presented followed by the ESEM analysis with resulting factors are presented. Then, development and estimation of the measurement model is presented followed by the estimation results. Finally, constructs of the model are assessed, followed by the validity and reliability assessment of the constructs. Finally, the results are reviewed.

### 6.1 Descriptive results

The survey was sent to 800 founders and co-founders of the Finnish KIBS start-up companies by e-mail. The data of the questionnaire included responses from 112 subjects. There were very few missing values in data. The amount varied between 1 missing value (AL3, EX1, EX3, CA1, CA5, CA7) and 4 (CA4) missing values. Because of the low degree of missing values, no imputation was used.

The descriptive results are presented in this section. The survey, using the measurement scales presented earlier, was delivered to the subjects to collect information about the ways how they managed business development issues in the start-up phase of their company. Responses to the claims of the measurement scales were given by the respondents using 7-point Likert scale having the following steps: 1: strongly agree, 2: moderately agree, 3: somewhat agree, 4: neutral (neither disagree nor agree), 5: somewhat disagree, 6: moderately disagree and 7: strongly disagree. The lowest number indicated the strongest level of conformity with the positive claim in question. The number 8 was reserved for the possibility to answer "I cannot or I do not want to answer" which was treated as a missing value. The means, medians and standard deviations of the measured items both for experimentation (EX1 - EX4), affordable loss (AL1 - AL3), flexibility (FL1 - FL4), and pre-commitments (PC1-PC6)), and for causality (CA1-CA4) are presented in TABLE 24.

TABLE 24 Means, medians and standard deviations of the measured construct items

Item	N		Mean	Median	Mode	Standard deviation
	Valid	Missing				
EX1	110	1	4.31	5.00	3	1.990
EX2 *	111	0	4.75	5.00	6	1.836
EX3	110	1	4.31	5.00	3	2.035
EX4	109	2	4.39	5.00	7	2.005
AL1	109	2	2.79	2.00	2	1.678
AL2	108	3	2.77	2.00	1	1.801
AL3	110	1	2.66	2.00	1	2.047
FL1	111	0	3.06	3.00	3	1.614
FL2	111	0	2.27	2.00	2	1.513
FL3	111	0	2.19	2.00	2	1.210
FL4	109	2	2.50	2.00	2	1.358
PC1	108	3	5.03	6.00	6	1.867
PC2	109	2	3.23	3.00	3	1.788
PC3	111	0	3.38	3.00	3	1.784
PC4	111	0	2.60	2.00	3	1.580
PC5	111	0	3.00	3.00	3	1.679
PC6	111	0	3.01	2.00	2	1.801
CA1	110	1	3.94	3.00	3	1.804
CA2	111	0	2.40	2.00	2	1.384
CA3	111	0	2.95	3.00	2	1.634
CA4	107	4	3.86	3.00	3	1.639
CA5	110	1	4.04	3.00	3	1.827
CA6	111	0	2.94	2.00	2	1.658
CA7	110	1	2.89	3.00	2	1.564

\*Reverse coded

The results regarding experimentation revealed that respondents made only some experimentation as the median of all items is 5 which is above the neutral value. However, the mode of item EX4 (=We tried a number of different approaches until we found a business model that worked) is 7 suggesting that most of the subjects did not need to make big efforts to find the best business model. The mean of all items measuring experimentation was 4.4 (SD=0.2). This indicated almost a neutral opinion regarding experimentation.

Median of items describing affordable loss was 2 indicating subjects' good capability to assess their own economic capacity. The mean of all items describing affordable loss was 2.7 (SD=0.1) indicating evidently, that they did not want to risk more money or other resources on their venture than they were ready to stand. Similarly, the mean of items of flexibility was 2.5 (SD= 0.4) indicates that respondents would to a certain extent agree that they were taking

advantage of the new opportunities in business as they arose. Regarding the fourth dimension of effectuation, pre-commitments, subjects indicated that they made somewhat great number of pre-contracts with their customers before they actually started business. However, in PC1 (= We used a substantial number of agreements with customers, suppliers and other organizations and people to reduce the amount of uncertainty) having a mean of 6, they indicated a strong disagreement against pre-contracts. The mean of all items of pre-commitments was 3.4 (SD= 0.9). As a summary, all effectuation items (mean 3.3, SD=0.9) suggest that respondents agree somewhat positively to effectuation claims of the scale.

Regarding the causal items of the measurement scale, all items are either neutral or slightly on positive side of the judgement scale. The mean of all items was 3.3 (SD=0.6) and was the same as for the mean of effects. This suggests that respondents agree somewhat positively also to causal claims of the scale. Results indicate that both effectuation and causal logics co-exist among the decision-making actions of respondents.

## 6.2 Processing outliers

Outliers in research data are data points which differ remarkably from other data points. Outliers may cause severe issues in statistical analyses, and may lead to biased parameter estimations and further, to misleading results. However, in many cases outliers can be seen not only as problematic issues which need to be fixed, but also as new research ways offering potentially new views on the phenomena under study (Aguinis, Gottfredson, & Joo, 2013). Unluckily, there are no clear guidelines how to treat outliers in different research configurations utilizing large variety of research methods, like SEM, regression, and many other methods. In many cases outliers are just deleted from data as a robust method to sanitize data from outliers as disturbing variables. Aguinis, Gottfredson & Joo (2013) propose several methods, based on their broad literature review, how to define, identify, and handle outliers in different research compositions. For SEM, they propose either deletion or robust regression method for handling outliers in SEM analysis. However, as they state, "Whether deletion or robust regression is used, we again emphasize the need to report the results obtained with and without the technique—a practice that also includes providing an explanation for any difference in substantive results" (Aguinis et al., 2013, p. 293).

In this research outlier detection was accomplished in two phases, in the first phase to find out if any of the respondents would be an outlier among all respondents, and in the second phase, if any of records would be an outlier among all records. The whole data was scanned to find out whether there are remarkable outliers in data.

In the first phase, all records were checked to find out if any of the respondents' records would be classified as outliers. Using Mahalanobis



distance and the significance of it using  $\chi^2$  (chi squared) distribution, it is possible to test if a respondent is an outlier. Mahalanobis distance is a measure of how much a respondent's values on the independent variables differ from the average of all respondents. A large Mahalanobis distance identifies a case as having extreme values on one or more of the independent variables (Aguinis et al., 2013; Yuan & Zhong, 2008). Mahalanobis distances were calculated for all respondents using all twenty four observed variables. After that the significance of the Mahalanobis distances was tested using  $\chi^2$  -significance test in SPSS software (IBM, 2018). For the  $\chi^2$  -test, degrees of freedom are the amount of all observed variables, in this case it is twenty four. The  $\chi^2$  -significance test with 24 degrees of freedom did not reveal any outliers showing that all significance values were statistically insignificant ( $p \ll 0.0001$ ). This proposed that no univariate or multivariate outliers were detected among the respondents.

In the second phase, for all observed variables a z-variable was calculated. For an observed variable a Z -value can be estimated using formula

$$Z = \frac{|X_i - \bar{X}|}{SD}$$

where

$X_i$  = observed variable

$\bar{X}$  = variable mean

SD = standard deviation of the variable

Following the calculation of z-values a boxplot having a box and whiskers, was printed for every z-value of a variable. Every boxplot included the median value, and the interquartile range (IQR) minimum and maximum values. Using whiskers, boxplot indicates the defeating data points given by the subjects for every observed variable. The size of the box indicates the IQR-range. IQR lower range means the 25 percent quartile and upper limit 75 percent quartile. Using this IQR-value also the criteria for the outliers can be defined. If the data point is  $1.5 \times$  IQR standard deviation from the upper or lower limit, it can be suspected to be an outlier, and in case of outlier, data point is more than 3 times the IQR values from the upper or lower limit. An example of a boxplot with a box, whiskers, suspected outliers, and significant outliers is depicted in FIGURE 8 (Source: IBM SPSS software output). Significant outliers are indicated with an asterisk (\*).

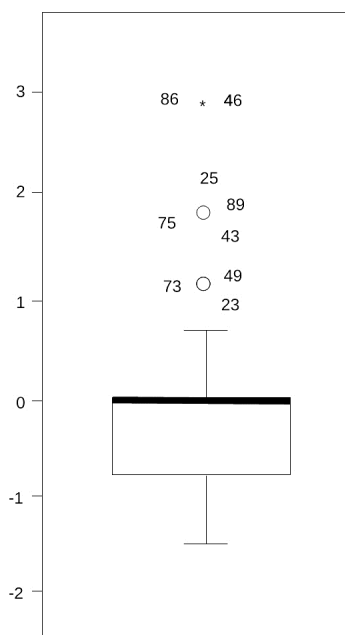


FIGURE 8 A boxplot of item CA3

Totally nine significant outliers were found in data. They are presented in TABLE 25. It is a common practice among researchers that outliers are simply deleted from data. However, this may also harmful from the results perspective because those outliers are not necessarily real outliers but might have valuable information about the respondent's specialty in replying to the query questions. For this reason, those values could be corrected manually so that they do not stand up from data but their information is still contributing to the analysis (Metsämuuronen, 2009). As seen in TABLE 25, there are two respondents, numbers 46 and 54 whose responses of two observed variables are classified as outliers, PC4 and CA3 for respondent number 46, and CA6 and CA7 for respondent number 54 respectively. All others are random respondents of three variables. For this reason, it was decided that values which were found outliers were not deleted but their values were replaced by the variable means. In this way their responses could be kept in the analysis and their information was not totally lost in further analyses.

TABLE 25 Outliers in data

Variable	Respondent
CA2	16
PC4	46, 29
CA3	86, 46
CA6	54
FL4	112
CA7	54
FL1	20
Total	111

### 6.3 Processing of research data

In order to have a view of the normality of observed variables, kurtosis and skewness of the parameters was checked. The SEM analysis postulates that data is multivariate normal (Gefen, Straub, & Rigdon, 2011). The analysis revealed that all variables except EX1, EX3, EX4, CA1, CA4 and CA5 show statistically significant values for skewness. Moreover, all variables except AL1, AL2, AL3, FL1, PC1, PC2, PC3, PC5, PC6, CA34, CA6 and CA7 show statistically significant values for kurtosis. Skewness and kurtosis indicators with standard errors are presented in TABLE 26.

TABLE 26 Skewness and kurtosis with their standard errors of observed variables

Item	Skewness	S.E.	Kurtosis	Std.error
AL1	0.987	0.231	0.110	0.459
AL2	0.960	0.233	-0.072	0.461
AL3	1.153	0.230	-0.056	0.457
EX1	-0.111	0.230	-1.423	0.457
EX2	-0.588	0.229	-1.072	0.455
EX3	-0.111	0.230	-1.422	0.457
EX4	-0.123	0.231	-1.387	0.459
FL1	0.992	0.229	0.157	0.455
FL2	1.500	0.229	1.548	0.455
FL3	1.573	0.229	3.039	0.455
FL4	1.323	0.231	2.018	0.459
PC1	-0.673	0.233	-0.809	0.461
PC2	0.627	0.231	-0.579	0.459
PC3	0.614	0.229	-0.596	0.455
PC4	1.229	0.229	1.035	0.455
PC5	0.869	0.229	0.018	0.455
PC6	0.984	0.229	-0.143	0.455
CA1	0.307	0.230	-1.205	0.457
CA2	1.666	0.229	2.898	0.455
CA3	1.082	0.229	0.460	0.455
CA4	0.203	0.234	-1.039	0.463
CA5	0.175	0.230	-1.229	0.457
CA6	0.906	0.229	-0.281	0.455
CA7	1.078	0.230	0.565	0.457

However, today there are estimating methods available for SEM analyses which do not require normality of variables when certain types of estimators are used. Robust estimators, like MLR (robust maximum likelihood), can be used for parameter estimations in spite of the non-normality of data (Byrne, 2012). This estimator is available in Mplus software version 7 (Muthen & Muthen, 2014) that was used in all analyses of the current research in hand.

## 6.4 Validity Assessment of the Measurement Scales

To ensure the validity of the measurement scales which were used in this study, an assessment of validity of them was performed. The measurement models contained 24 items which described five latent constructs: one construct for causality and four constructs for second-order formative effectuation construct, namely flexibility, pre-commitments, affordable loss, and experimenting.

Research validity in surveys relates to the extent at which the survey measures right elements that need to be measured. In simple terms, validity refers to how well an instrument as measures what it is intended to measure. By its definition, validity describes truth-value of the results of the study (Seale 2004). Validity can be divided into three components; measurement, and internal and external validity. These are defined by Kurkinen (2012) as follows. Measurement validity is defined "as the degree to which the items in the questionnaire describe the concept which is to be measured", internal validity "implies the extent to which causal linkages can be supported by the study", and finally "the external validity implies the extent to which the generalization of the results of the study can be relied upon" (Kurkinen, 2012, p. 67). According to Seale (2004) one of methods to improve measurement validity is to utilize face validity. In that method the items of the questionnaire are assessed to find out if the questions really measure the concept they are intended to measure.

In the current study, face validity was ensured in several ways. Firstly, the development of the scales was made step by step. In step one all construct items were taken from previously validated instruments for effectuation and causation (Chandler et al., 2011). In step two, after the scales were developed they were cautiously translated into the Finnish language from the original English language by the author. Following translation, the questions of the scales were reviewed with one representative of the target entrepreneurs. The aim of the review was to ensure that the questions would be understood by entrepreneurs. Only some modifications and word changes were done after that review.

In step three, the questions of the scales were put under a sorting procedure. The purpose of the sorting procedure was to measure the degree of the sorting agreement between the raters, in other words how well sorters are able to sort the questions of the model into their correct 5 constructs. Sorting was performed in consecutive two rounds. In round one, ten sorters sorted the questions. After the raters returned the results of their sorting, the results were manually checked. The sufficiency of the sorting agreement was analyzed using item placement scores (Moore & Benbasat, 1991) and Fleiss' kappa calculation (Fleiss, 1971). The item placement score is an indicator of how many items are placed in the targeted category, in this case on the constructs of the measurement model, by the raters. After the rating round one the overall hit ratio was 63.75 per cent. It was deemed to be too low and for that reason some

items were re-worded to make them clearer. After that there was a second round, similar to the first one. Five raters, being a subgroup of the first group, sorted questions again. Now the overall hit ratio was acceptable 85.83 per cent and Fleiss' kappa  $\kappa = 0.797$ , S.E. = 0.03. The statistical significance of Fleiss' kappa value was tested examining the normally distributed t-value  $\kappa/\text{S.E.}$  which was 25.217. It suggested that the agreement between sorters was significantly ( $p < 0.000$ ) better than done by chance.

When the scales were validated they were put under pilot testing. E-mail with the link to the questionnaire was sent to a randomly selected 200 participants among the selected target group. For the pilot testing there were finally 20 participants. They also gave verbal feedback of the questionnaire. In spite of the small size of the pilot group the constructs were checked in factor analysis to see whether the factor structure could be accepted. Factor analysis indicated acceptable fit of the model with pilot data. Only some minor changes were made in the items text. After that the scales were accepted to be used in the final questionnaire.

## 6.5 ESEM testing and development of the SEM model

After exploratory structural analysis (ESEM) was selected as a testing method, the model was needed for it. In fact, there are two parts in the development of SEM model, namely measurement part and structural part. The first part, the measurement part, includes the loadings of the observed items on the latent structures, and the measurement model is analyzed using confirmatory factor analysis (CFA). The second part, structural part, includes estimations of the relationships between latent construct which in most cases include both dependent (endogenous) and independent (exogenous) factors (Gefen et al., 2011). Using ESEM, both measurement model and structural model analyses can be combined into the same analysis. When the measurement model is analyzed, the factor loadings and measurement errors of the observed items are estimated. Similarly, in ESEM analysis, the paths and their statistical significances between constructs are estimated. In this way, ESEM can also be understood as a combination of exploratory factor analysis and path analysis (Asparouhov & Muthén, 2009).

In development of the SEM model, five stage procedure can be used (Schumacker & Lomax, 2010). Those five steps are as follows: model specification, model identification, model estimation, model testing, and model modification. In the model specification phase, the theoretical model is developed, and based on literature, constructs and relationships between them are defined. The next phase, model identification phase is for finding a unique set of parameter estimates for the model to create an overidentified model. Identification of a model is not dependent of the amount of data but is a mathematical property of the model. In the model estimation phase the estimates of parameters are calculated. In testing phase, the fit of model to

observed data is tested. Finally, in modification phases the model is adjusted and modified if needed.

In the current research in hand the basic research model and the constructs for it were based on the measurements scales developed by Chandler et al. (2011). Their conclusion of the effectuation construct was that it is a second-order formative construct, containing four separate sub-constructs, which in turn are formed by reflective items. Because of the special character of the effectuation construct, special attention had to be paid on the correct specification and especially on correct identification of that construct. For this reason, the identification phase of the model development of this research is described in more details in the next paragraph followed by the introduction to various model testing methods and goodness of fit indicators which were used.

Including formative constructs into a measurement model for confirmatory factor analysis causes major issues, especially related to the identification of the model (Diamantopoulos, 2011). The formative construct having formative indicators, even though those have been measured using reflective items, is under-identified. In practice this means that the model having only the formative construct alone cannot be identified and its model fit cannot be tested, even though the construct is fully determined by its indicators. It can be changed to be identified and to be estimated only if it is placed within a larger model containing consequences in a form of latent construct. Especially, either at least two reflective constructs, or one reflective construct and one reflective indicator, must be specified as outcomes of the formative construct in order to get the path coefficients and the variance of error terms to be estimated for the model (Jarvis et al., 2003). However, adding additional outcome variables into the model, causes the model to become context specific (Diamantopoulos, 2011). It may also lead to confounding interpretations even though the model itself is clearly defined and identified. By adding additional outcome variables into the model, changes the model effectively to MIMIC (multiple indicator multiple cause) model which is a typical model for a covariance-based SEM. The formative construct as a latent factor is an unobservable and has no definite scale and therefore it must be scaled, in other words it needs to be assigned with measurement units. One of the ways is to fix the variance of the factor to unity. It has been shown in the literature that the selection of the scaling method may dramatically affect on the parameter estimates and on the results. However, there is still no clear consensus among researchers of the best choice. In this research in hand, setting the variance to unity was used for scaling the formative construct. Moreover, as the formative construct is fully defined by its indicators, the residual was set to zero to get the model identified as instructed in literature (Diamantopoulos, 2011).

Model testing is a phase where the fit of the observed data to the parameter estimates is tested. There are several fit indices which can be used to assess the fit of the measurement model with response data.

The following indices were used to assess the fit of the model:

- overall goodness-of-fit test using  $\chi^2$  (chi-square) testing
- Root Mean Square Error of Approximation (RMSEA)
- Standardized Root Mean Square Residual (SRMR)
- Comparative Fit Index (CFI)
- Tucker-Lewis index (TLI)
- Average variance explained (AVE)
- Cronbach's Alpha

The  $\chi^2$  (chi-square) testing is a method to test the overall fit of the model. It is used to test if the observed data accepts or rejects the model. The test is accomplished by comparing the covariance matrix of observed data to that of the model. A small  $\chi^2$ - value implies a good fit and large value rejection because the  $H_0$  -hypothesis is that there is no difference between the matrices. The number of the estimated parameters and the number of known parameters defines the degree of freedom (df) of the  $\chi^2$  -test. The p-value from the test together with the degrees of freedom express the fit of the model with the limit of  $p \geq 0.05$  when there is a good and acceptable fit. With large sample sizes, even as small as  $N = 250-300$ , the  $\chi^2$  -test may reject the model fit (Stommel, Wang, Given, & Given, 1992). In the current research in hand this is not an issue as the sample size is not that big. When evaluating the parameter estimates, they must be statistically significant. For all estimated parameters this means that the significance level ( $p \leq 0.05$ ) is used to assess the calculated t-values of the estimates so that  $|t\text{-value}| > 1.96$  (Hooper, Coughlan, & Mullen, 2008).

Root Mean Square Error of Approximation (RMSEA) is an absolute fit index, which describes the fit of a model using the discrepancy function. The value of  $RMSEA < 0.05$  expresses a close fit;  $0.05 < RMSEA < 0.08$  indicates reasonable fit, and a model having a value of  $RMSEA > 0.1$  is not acceptable. If the RMSEA equals zero there is an exact fit. The confidence interval can also be calculated for the value of RMSEA. For the well-fitting model the lower limit of the confidence interval ( $p=0.05$ ) should be near zero and the upper limit should be less than 0.08 (Hooper et al., 2008).

Standardized Root Mean Square Residual (SRMR) is an absolute measure for the model fit. It represents the average of the standardized residuals between the observed and predicted values in their corresponding covariance matrices. When SRMR equals zero it indicates an exact fit of the model with data. SRMR is relatively independent of the sample size. The values  $SRMR < 0.05$  are considered to express acceptable fit, even though values of up to  $SRMR < 0.08$  are considered as acceptable (Weston & Gore, 2006).

Comparative Fit Index (CFI) is an incremental fit index. It is a measure for model sufficiency, comparing the model to a null model. The range of CFI is between 0 and 1. The limit for an acceptable value of CFI is 0.9. The value of  $CFI > 0.95$  is an indication of a good fit (Hooper et al., 2008).

Tucker-Lewis index (TLI) is an incremental fit index. It is also known as the Non-normed Fit Index (NNFI). It is an outcome of the comparison test of the  $\chi^2$ -values of the model to the  $\chi^2$ -values of the null model. The null model is presented as the worst-case scenario having a zero fit of the parameters. Values of TLI range from 0 to 1. Values  $TLI \geq 0.95$  are considered acceptable. Using the TLI -index for testing prefers simple models and is sensitive to large sample sizes, underestimating sample sizes of less than 200 samples (Hooper, Coughlan & Mullen 2008).

The convergent validity was evaluated by examining the average variance extracted (AVE), which should be more than 0.5. Further, the discriminant validity was evaluated by investigating the square root of the AVE of every construct which should be more than the correlation of that construct with other constructs.

The reliability of the scales was evaluated using Cronbach's alpha. The values of Cronbach's alpha should be above 0.7 (Gefen et al., 2000; Tavakol & Dennick, 2011), or above 0.6 (Metsämuuronen, 2009).

## 6.6 Estimation of the Measurement Model

The developed research model which is depicted in FIGURE 9 was aimed to measure the relationships between the latent variables (effectuation, causal) and their observed antecedents (prior entrepreneurial experience, prior international experience) and dependent items (financial performance, degree of internationalization). As described earlier, effectuation was measured as a second-order formative construct having four reflective sub-dimensions and is part of a MIMIC model in the measurement model. Causation was measured using seven reflective observed items.



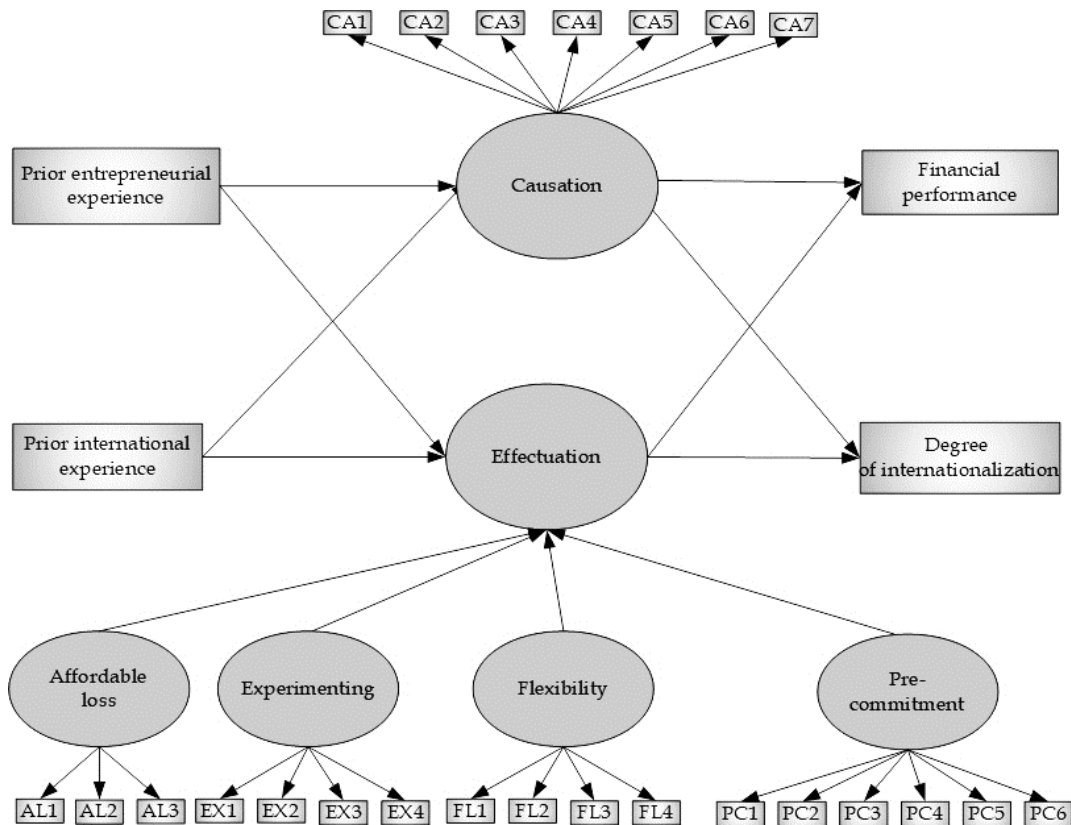


FIGURE 9 Measurement model with all construct items

One of the main goals of the SEM analysis is “to find the most parsimonious summary of the interrelationships among variables that accurately reflects the associations observed in the data” (Weston & Gore, 2006, p. 732). Parsimony in the context of CFA and SEM analysis means a property of a model having relatively few free parameters, or relatively many degrees of freedom. Traditionally the parsimony in SEM is assumed to be a linear decreasing dependence of the variables to be estimated in the model. On the other hand, in SEM analyses, parsimonious models have been argued to be favored, because it is harder to obtain a good fit with data, and if the fit has been achieved, the results are considered to be more valuable, and hence parsimony is a virtue in SEM analyses (Weston & Gore, 2006).

The original measurement model was reviewed and edited to get a parsimonious model but fulfilling the requirements for the hypotheses testing. For this purpose, the original full model was replaced by the parsimonious model which is depicted in FIGURE 10. In the parsimonious model the latent constructs of effectuation and causation would be replaced by their respective factor scores. Effectuation was to be second order formative construct formed by the four formative sub-constructs and the estimates of which would be from the factor scores of the items from the ESEM analysis. Causation factor was to be first order reflective construct and the estimates of it would be factor score from the ESEM analysis of the causation variables.

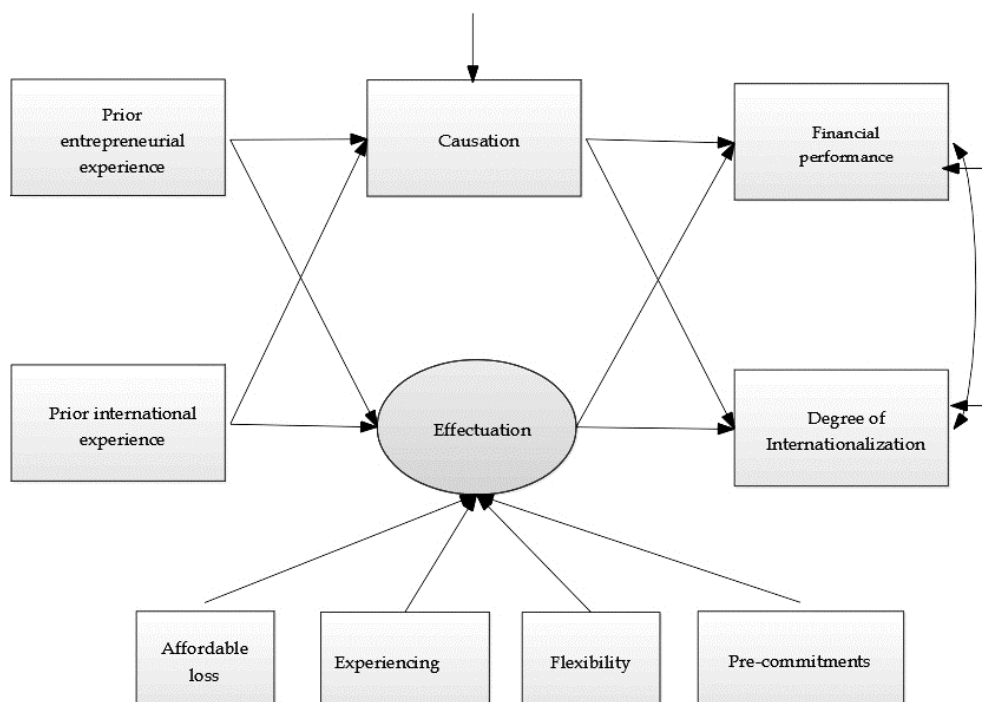


FIGURE 10 Parsimonious measurement model

For prior entrepreneurial experience, prior international experience, financial performance and degree of internationalization the operationalized single item observed variables were used as indicators. For effectuation and causation indicators were obtained from factor scores from the ESEM model analysis having two constructs, namely reflective construct of causality, and formative construct of effectuation, without any endogenous or exogenous parameters. Factor scores are latent composite scores for every subject on each factor (Metsämuuronen, 2009). Factor scores are calculated by applying the factor pattern matrix to the observed variables. They can be used for further statistical analyses instead of the measured variables (Devlieger & Rosseel, 2017). Using ESEM, instead of using for example only explorative factor analysis (EFA), or confirmative factor analysis (CFA) has some advantages. These include benefits such as that measurements and parameter estimations are made on latent construct level, error terms can be estimated and can be distinguished for the real factor estimates, and that offers also more flexibility in model creation (Marsh, Nagengast, & Morin, 2013).

In order to get the factor scores to be used as indicators in the parsimonious model, the ESEM model was created. For that, five factor model having causality as a first order reflective factor, and effectuation as a second order formative factor manifested by four reflectively measured sub-constructs, namely affordable loss, flexibility, experimentation and pre-commitments as suggested by Chander et al. (2011). The constructs for that model were formed using construct items described earlier. The adequacy of the measurement model was tested using the exploratory structural modeling analysis (ESEM).

To illustrate, how the factors look like, an illustrative view of the ESEM model including all constructs items is demonstrated in FIGURE 11. The abbreviation “ca” denotes a causality factor, “ex” denotes experience dimension of effectuation, and abbreviations “al”, “fl”, and “pc” denote dimensions affordable loss, flexibility, and pre-commitments respectively.

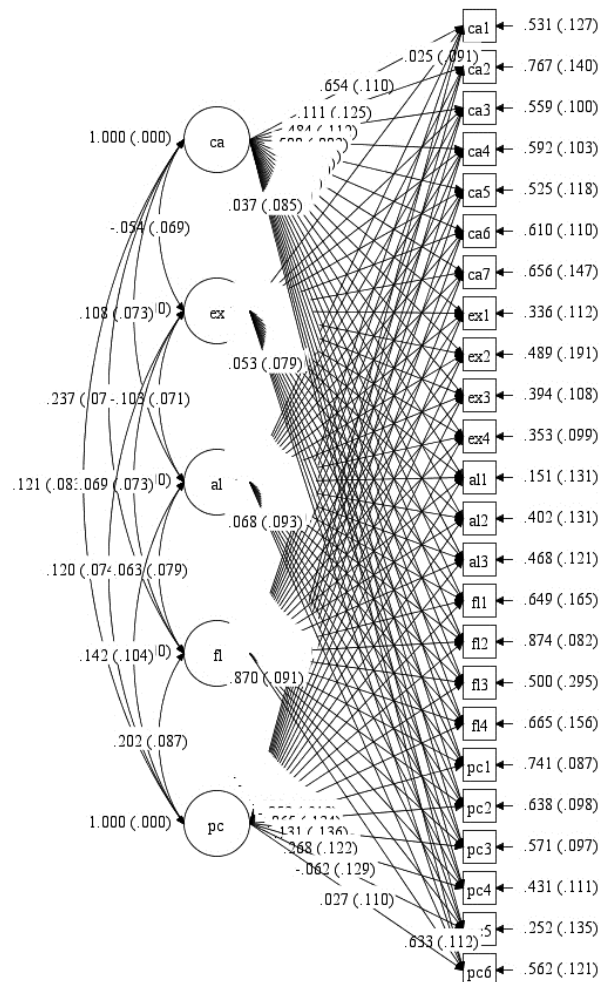


FIGURE 11 ESEM model with all construct items (standardized values, for demonstrative purpose only)

The ESEM model with all construct items was estimated using the MLR estimator and oblique rotation in the ESEM framework of the Mplus software. All subjects were used (N=112). The  $\chi^2$  test rejected the model fit ( $\chi^2$  (166)= 266.794, p=0.000, RMSEA=0.074, CFI=0.860, TLI=0.767, SRMR=0.046).

The standardized factor loadings and standard errors for all items and all factors are presented in TABLE 27 .

TABLE 27 Standardized factor loadings and standard errors for all items and all factors

	CAUSALITY		EXPERIMENTATION		AFFORDABLE LOSS		FLEXIBILITY		PRE-COMMITMENTS	
		S.E.		S.E.		S.E.		S.E.		S.E.
CA1	<b>0.654</b>	0.11	0.025	0.091	0.105	0.086	0.018	0.118	0.037	0.104
CA2	<b>0.111</b>	0.125	0	0.133	0.093	0.104	0.375	0.18	0.139	0.128
CA3	<b>0.484</b>	0.112	0.167	0.106	-0.147	0.09	0.182	0.15	0.228	0.125
CA4	<b>0.599</b>	0.093	-0.01	0.083	-0.017	0.09	0.163	0.123	0.003	0.091
CA5	<b>0.675</b>	0.094	-0.104	0.093	-0.055	0.087	0.016	0.118	0.016	0.083
CA6	<b>0.485</b>	0.112	-0.259	0.093	0.139	0.096	-0.218	0.152	0.036	0.113
CA7	<b>0.532</b>	0.136	0.199	0.095	0.131	0.108	-0.033	0.221	0.037	0.122
EX1	0.04	0.063	<b>0.749</b>	0.109	-0.085	0.08	0.197	0.183	0.055	0.08
EX2	-0.236	0.114	<b>0.622</b>	0.137	-0.015	0.092	-0.275	0.199	0.121	0.109
EX3	-0.035	0.072	<b>0.774</b>	0.076	-0.026	0.063	-0.014	0.087	-0.002	0.067
EX4	0.141	0.083	<b>0.789</b>	0.082	-0.003	0.071	0.081	0.114	-0.049	0.072
AL1	0.042	0.067	-0.024	0.049	<b>0.909</b>	0.081	0.037	0.091	-0.027	0.056
AL2	-0.049	0.075	-0.008	0.074	<b>0.777</b>	0.087	-0.029	0.091	0.038	0.07
AL3	-0.032	0.069	-0.028	0.071	<b>0.702</b>	0.093	0.125	0.072	-0.004	0.067
FL1	-0.178	0.095	0.03	0.092	-0.057	0.07	<b>0.59</b>	0.151	-0.065	0.091
FL2	0.15	0.124	-0.034	0.101	0.083	0.122	<b>0.107</b>	0.16	0.22	0.144
FL3	0.035	0.078	0.066	0.096	0.121	0.131	<b>0.651</b>	0.276	0.053	0.103
FL4	0.063	0.075	-0.055	0.092	0.177	0.095	<b>0.508</b>	0.142	0.025	0.098
PC1	0.203	0.152	-0.26	0.121	-0.052	0.124	-0.053	0.212	<b>0.361</b>	0.116
PC2	0.287	0.121	0.025	0.103	0.204	0.111	0.065	0.134	<b>0.376</b>	0.107
PC3	0.039	0.085	0.047	0.099	-0.081	0.094	0.131	0.136	<b>0.601</b>	0.09
PC4	-0.067	0.075	0.042	0.084	0.006	0.066	0.268	0.122	<b>0.661</b>	0.1
PC5	0.019	0.062	-0.001	0.064	0.017	0.056	-0.062	0.129	<b>0.870</b>	0.091
PC6	0.037	0.085	0.053	0.079	0.068	0.093	0.027	0.11	<b>0.633</b>	0.112

The output of the analysis was reviewed for improvements of the model. There were several modification indices suggesting modifications for model. All of them were related to the relaxing the residual covariances between the items. However, only one of them was stood out and was relevant, and which could be justified also by the effectuation theory, estimating the residual covariances between EX2 and EX3 would make the model fit better (MI= 10.070). As suggested by the modification index, that change was implemented to the model and it was tested again. However, the model was rejected again and no improvement to the model could be detected. After the test, no relevant modification indices were suggested. Hence, after reviewing the original model

and the factor loadings, there were several items which had either insignificant or low loadings, or both on their expected factors indicating that the variables had small all no contribution on the factors. Similarly, by observing the  $R^2$  - values (squared multiple correlations) of the variables it was seen that some of those were statistically insignificant. Those were CA2 (standardized loading= 0.111, SE= 0.125), CA3 (standardized loading= 0.484, SE= 0.000), CA6 (standardized loading= 0.485, SE= 0.000), EX2 (standardized loading= 0.622, SE= 0.000), FL2 (standardized loading= 0.107, SE= 0.502), PC1 (standardized loading= 0.361, SE= 0.000), PC2 (standardized loading= 0.376, SE= 0.000), and PC3 (standardized loading= 0.601, SE= 0.000). The procedure how to handle those items, is instructed in the literature: “eliminate indicators that have (1) nonsignificant loadings on the hypothesized sub-dimension, (2) large and significant cross loadings on non-hypothesized sub-dimensions, and/or (3) large and significant measurement error covariances with indicators of other sub-dimensions” (MacKenzie et al., 2011, p. 317). Hence, aforementioned items were removed from the ESEM model.

A new revised model with smaller amount of variables, demonstrated for illustrative purposes in FIGURE 12, was estimated. The  $\chi^2$  test accepted the model fit ( $\chi^2$  (50)=63.477,  $p$ =0.0954, RMSEA=0.049, CFI=0.969, TLI=0.925, SRMR=0.026). All the  $R^2$  -values (squared multiple correlations a.k.a coefficient of determination) of the variables were mostly substantial ranging from 0.316 (FL4) to 0.828 (AL1), and all of them were statistically significant. In addition, cross loadings remained very small, the biggest cross-loading was PC4 cross-loading on flexibility (0.175, S.E.= 0.095). However, all cross-loadings were statistically insignificant.

When the model was accepted the means of the effectuation and causality items were calculated in order to be used in assessing which one is a prevailing decision-making logic. The means and modes with corresponding standard errors were calculated for causal logic as a mean of item CA1, CA4, CA5 and CA7, and for effectuation as a mean of items EX1, EX2, EX3, AL1, AL2, AL3, FL1, FL3, FL4, PC2, PC3, PC4, and PC5. The mean score of effectuation indicated that respondents were more effectuation driven (mean = 3.18, S.E.= 0.08) than causality driven (mean = 3.66, S.E. = 0.12).

Because of the model fit was accepted, the factor scores for the effectuation constructs (affordable loss, experimentation, flexibility, pre-commitments) and for the causality construct from this test were stored in a file for the further test of the fit of the final parsimonious model.

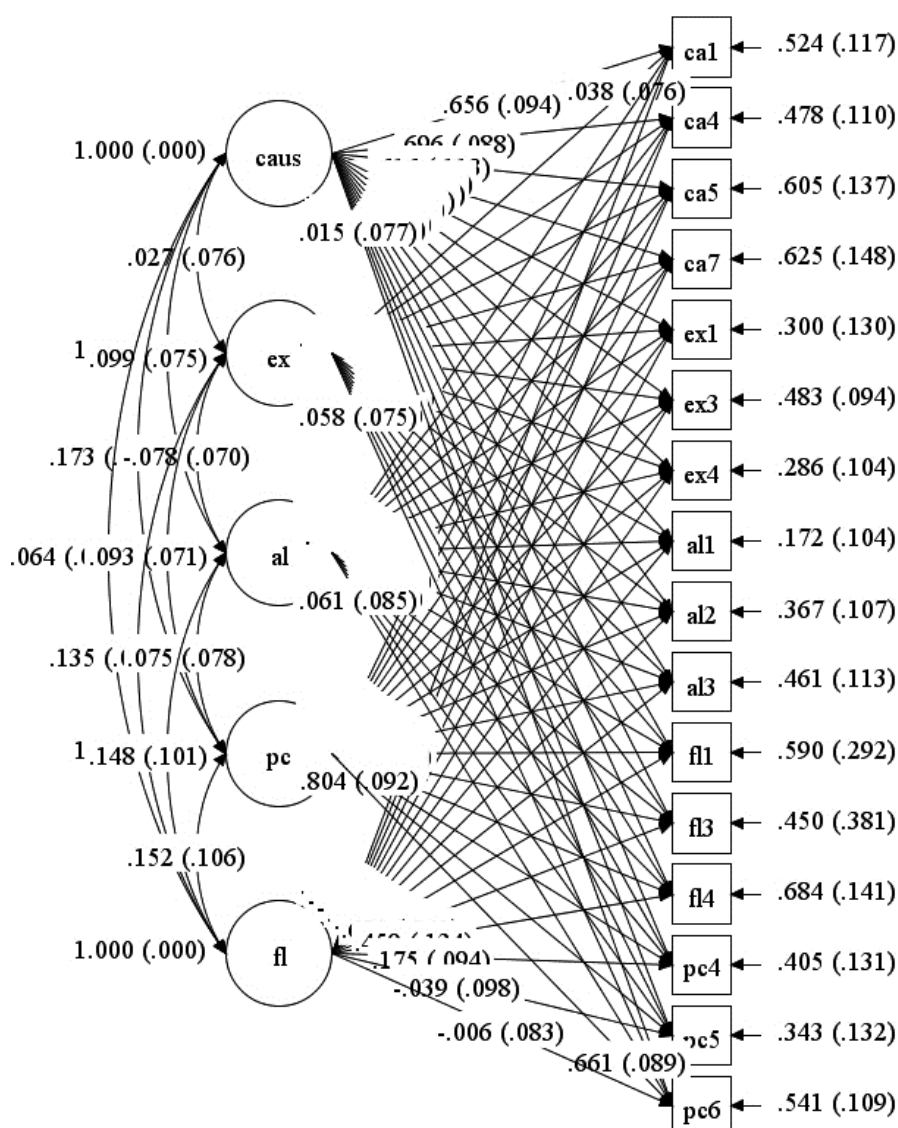


FIGURE 12 Revised ESEM model (for demonstrative purpose only)

The standardized factor loadings with their corresponding standard error (SE) and  $R^2$  -values of the items of the revised ESEM model are presented in TABLE 28. Factor loadings of the target factors are in bold.

TABLE 28 Factor loadings and standard errors of target factors plus R<sup>2</sup> values of items

	Causality	S.E.	Experimentation	S.E.	Affordable loss	S.E.	Flexibility	S.E.	Pre-commitments	S.E.	R <sup>2</sup>
CA1	<b>0.656</b>	0.094	0.038	0.076	0.094	0.08	-0.024	0.111	0.076	0.096	0.476
CA4	<b>0.696</b>	0.088	-0.013	0.075	-0.053	0.072	0.172	0.142	0.006	0.073	0.522
CA5	<b>0.616</b>	0.113	-0.102	0.102	-0.048	0.097	-0.032	0.142	0.056	0.098	0.395
CA7	<b>0.560</b>	0.126	0.162	0.087	0.101	0.093	-0.062	0.185	0.061	0.095	0.375
EX1	-0.028	0.058	<b>0.788</b>	0.11	-0.069	0.074	0.122	0.164	0.101	0.063	0.700
EX3	-0.081	0.076	<b>0.711</b>	0.072	-0.038	0.072	0.011	0.091	-0.001	0.077	0.517
EX4	0.101	0.06	<b>0.841</b>	0.07	0.018	0.059	-0.005	0.103	-0.033	0.055	0.714
AL1	0.091	0.064	-0.052	0.046	<b>0.880</b>	0.068	0.066	0.081	-0.013	0.054	0.828
AL2	-0.065	0.07	0.070	0.064	<b>0.803</b>	0.066	-0.048	0.074	0.032	0.062	0.633
AL3	-0.016	0.071	-0.023	0.076	<b>0.703</b>	0.088	0.127	0.08	0.016	0.066	0.539
FL1	-0.148	0.099	0.047	0.108	-0.077	0.065	<b>0.633</b>	0.255	-0.08	0.082	0.410
FL3	0.108	0.118	0.051	0.095	0.081	0.128	<b>0.680</b>	0.341	0.087	0.094	0.550
FL4	0.103	0.089	-0.022	0.084	0.174	0.081	<b>0.459</b>	0.124	0.107	0.096	0.316
PC4	-0.02	0.062	0.052	0.065	-0.009	0.051	0.175	0.094	<b>0.721</b>	0.103	0.595
PC5	0.072	0.067	-0.034	0.056	-0.019	0.054	-0.039	0.098	<b>0.804</b>	0.092	0.657
PC6	0.015	0.077	0.058	0.075	0.061	0.085	-0.006	0.083	<b>0.661</b>	0.089	0.459

After reviewing the results of the ESEM analysis, five distinctive factors could be detected, namely one factor for causality, and four factors experimentation, affordable loss, flexibility and pre-commitments which were the sub-dimensions of effectuation as presupposed based on the effectuation theory. In the next phase, the factor scores produced in the ESEM above were used to test the parsimonious model which was depicted in FIGURE 10.

The means, standard deviations and correlations between variables are presented in TABLE 29. Table displays that effectuation is positively correlated with internationalization, causality, prior entrepreneurial experience and very highly to prior international experience but not to financial performance, which indicates insignificance path between these two. Financial performance is positively correlated with causality. Degree of internationalization is positively correlated with prior entrepreneurial experience. Causality is negatively correlated with prior entrepreneurial experience, which in turn is correlated with prior international experience.

TABLE 29 Means, standard deviations and correlation matrix between latent variables

	Mean	S.D.	1	2	3	4	5	6
1 Effectuation	3.18	1.27	1					
2 Financial performance	3.55	1.61	-0.060	1				
3 Degree of Internationalization	3.47	0.76	0.377***	0.083	1			
4 Causality	3.66	0.83	0.162***	0.232**	-0.072	1		
5 Prior entrepreneurial experience	1.55	0.50	0.470***	0.036	-0.178**	-0.110*	1	
6 Prior international experience	1.43	0.50	0.743***	0.057	-0.281***	0.172	0.124	1

\*\*\* =  $p < 0.000$ , \*\* =  $p < 0.005$ , \* =  $p < 0.10$

## 6.7 Estimating the SEM model

The model developed above and depicted in FIGURE 10 was tested with all the subjects (N=112) using factors scores for the causality and effectuation from ESEM analysis. The formative model identification and scaling of the measurement scale required that some constraints had to be applied in the model (Franke, Preacher, & Rigdon, 2008). Hence, because a formative construct is explained fully by its composites, the residuals of the effectuation were set to value of zero. Similarly, to reach the identification of the model, the variance was set to unity. The  $\chi^2$ -test accepted the model fit with data ( $\chi^2(12)=12.250$ ,  $p=0.4258$ , RMSEA=0.014, CFI=0.985, TLI=0.974, SRMR=0.045), scaling correction factor =0.9532.

The results of the test reveal that the weights of the four effectuation sub-dimensions in the formative effectuation construct were substantial and significant. The weights of affordable loss ( $\gamma = 0.249$ ,  $t=2.308$ ), experimentation ( $\gamma = 0.244$ ,  $t=2.239$ ), flexibility ( $\gamma = 0.222$ ,  $t=2.297$ ), and pre-commitments ( $\gamma = 0.239$ ,  $t=2.302$ ) were all on the same level. This indicates an acceptable consistency of the formative second-order structure of effectuation.

Regarding the structural paths between the entrepreneurial experience and effectuation, the effect of previous entrepreneurial experience to effectuation was positive, high and significant (standardized  $\beta = 0.406$ ,  $t=2.027$ ) indicated that prior experience had a significant effect on the use of effectuation logic. Hence, hypothesis *H1*, *Prior entrepreneurial experience tends to guide entrepreneurs to use effectuation rather than causation* was supported. Similarly, the path from prior international experience to effectuation was considerably positive and significant (standardized  $\beta = 0.756$ ,  $t=4.556$ ) suggested that prior



international experience had a strong positive effect on using effectuation logic. Further, the path from prior entrepreneurial experience to causality (standardized  $\beta = -0.090$ ,  $t = -0.952$ ) indicated that prior entrepreneurial experience had no effect on using causal logic. However, the path from international experience to causality (standardized  $\beta = -0.161$ ,  $t = -1.684$ ) indicated that international experience had noteworthy negative, and significant ( $p < 0.01$ ) effect on using causal logic. Hence, hypotheses *H3: International experience tends to guide entrepreneurs to use effectuation logic rather than causation logic* was supported.

The results of the test reveal that the path coefficient from effectuation to financial performance is insignificant (standardized  $\beta = -0.023$ ,  $t = -0.185$ ) suggesting that effectuation has no effect on company's financial performance. Hence, the hypothesis *H2: Effectuation rather than causation has a positive effect on the financial performance of a start-up* was not supported. This was suspected already earlier based on the low correlation value between them. Regarding causal logic, the path coefficient from causality to financial performance was remarkably positive and significant (standardized  $\beta = 0.228$ ,  $t = 2.151$ ) suggesting that causal logic has a significant impact on financial performance.

Further, the path coefficient from effectuation to degree of internationalization was considerably positive and statistically significant (standardized  $\beta = 0.375$ ,  $t = 4.609$ ). This suggests that the hypothesis *H4: Effectuation rather than causation has a positive effect on the degree of internationalization of a start-up* was supported. The results suggest that entrepreneurs behaving according to effectuation logic in their decision-making, anticipate to concentrate more on international business than on domestic businesses. The path coefficient from causality to internationalization was small and insignificant (standardized  $\beta = -0.011$ ,  $t = -0.113$ ). This indicated that causality has no effect on the degree of company's internationalization.

The estimated parsimonious SEM model with estimated formative factor weights, residual variances, R<sup>2</sup>-values, and path coefficients is depicted in FIGURE 13.

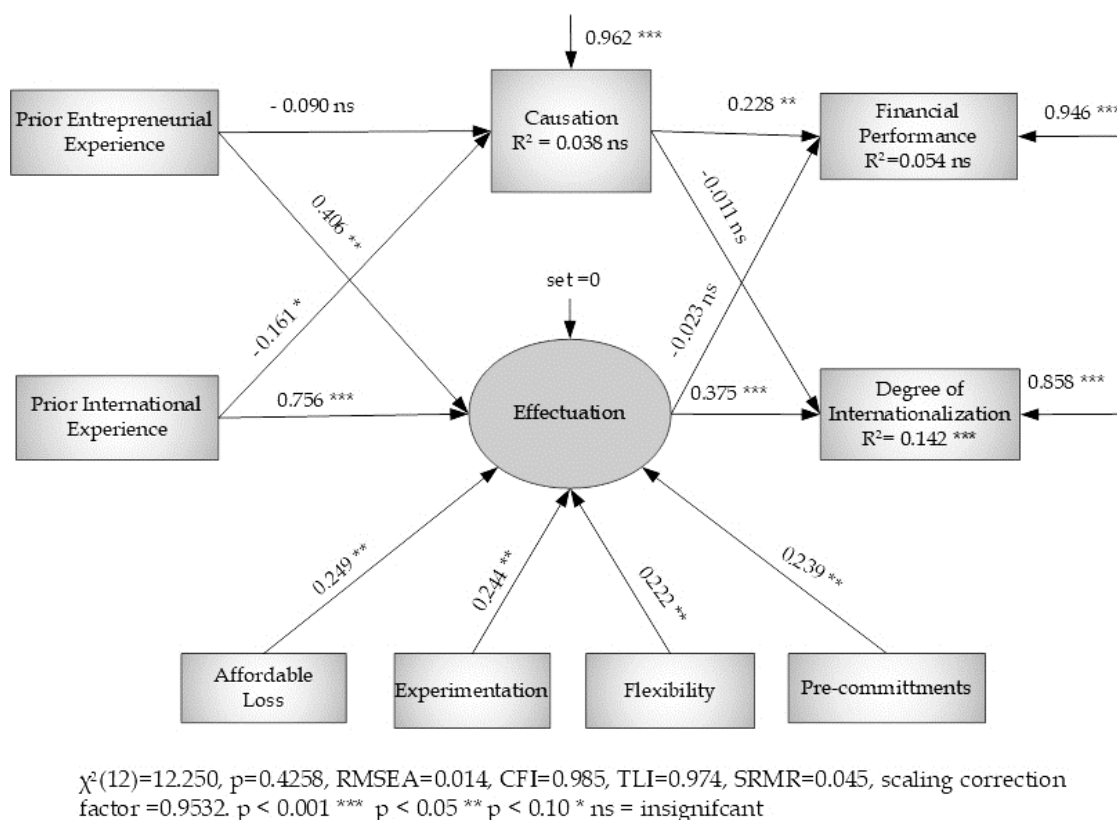


FIGURE 13 The estimated formative factor weights, residual variances, R<sup>2</sup>-values, and path coefficients

A summary of the results of the estimations of the effects of prior experience and prior international experience on effectuation and causality, the effects of effectuation and causation on financial performance, and on the degree of company's internationalization are presented in TABLE 30.

TABLE 30 Effects of prior experience and prior international experience on effectuation and causality, the effects of effectuation and causation on gross margin and on the degree of company's internationalization

	Effectuation	Causation	Financial Performance	Degree of internationalization
Prior entrepreneurial experience	0.406 (t=-2.207)	-0.090 (t=0.952)	N/A	N/A
Prior international experience	0.756(t=-4.556)	-0.161 (t=1.684)	N/A	N/A
Effectuation	N/A	N/A	0.023 (t=0.185)	-0.375 (t=-4.609)
Causation	N/A	N/A	-0.228 (t=-2.151)	0.110 (t=0.113)

The results of the test suggested that 14.2 per cent ( $R^2 = 0.142$ ,  $t=2.309$ ) the variance of degree of internationalization could be explained by its antecedents; causality, effectuation, prior experience and by the prior international experience. As was seen earlier, these results suggest that entrepreneurs behaving according to effectuation logic in their decision-making, anticipate to concentrate more on international business than on domestic businesses. The path coefficient from causality to internationalization was small and insignificant (standardized  $\beta = -0.011$ ,  $t=0.113$ ), and thus causality, and experience and prior international experience indirectly via causality, could not explain the variance of internationalization. This indicated that causality has no effect on the degree of company's degree of internationalization. All of the variance explained of degree of internationalization was caused directly by effectuation, and indirectly by experience and international experience via effectuation.

The real causes of the variance explained of financial performance were not able to be explained by its antecedents as the squared multiple correlation of financial performance was insignificant ( $R^2 = 0.054$ ,  $t=1.129$ ). Similarly, the squared multiple correlation of causation was insignificant ( $R^2 = 0.038$ ,  $t=1.087$ ) and the variance of it cannot be explained by its antecedents, prior entrepreneurial experience and prior international experience.

The squared multiple correlation of effectuation could not be estimated directly, because the residuals of it were set to the value of zero to get the measurement model identifiable. However, the adequacy of a formative construct of effectuation formed by its observed sub-constructs could be assessed using the adequacy coefficient or squared canonical structure coefficient,  $R_a^2$  (Edwards, 2001). It is a statistic measure indicating the proportion of variance of an observed variable that it shares with the formative variable generated from the observed variable set. It is calculated by summing the correlations between the effectuation sub-dimensions and the effectuation construct itself and dividing the sum with the amount of the sub-constructs (four). It is analogous with the coefficient of determination ( $R^2$ , reliability

coefficient) in the context of assessment the quality of the constructs. The use and calculation of the  $R_a^2$  coefficient will be discussed in more details in the context of validity assessment of the measurement scales.

Because of the low  $R^2$  - value of causality the model was redefined to non-recursive model so that effectuation and causality were reciprocal in relation to each other. To the knowledge of the author this type of reciprocal model for causality and effectuation has not been reported in prior literature. However, their mutual correlation was somewhat substantial and significant and for that reason this model was estimated as well. To achieve the identification of the model the other path was set to the value of equity. The model is depicted in FIGURE 14. The  $\chi^2$ test accepted the fit of the model with data ( $\chi^2$  (11)=7.513,  $p=0.7562$ , RMSEA=0.000, CFI=1.000, TLI=1.000, SRMR=0.034, scaling correction factor =0.9336). The paths from effectuation to causation and vice versa were remarkable and significant (path coefficients 0.228 ( $t=2.4849$ ) and 0.337  $t=1.937$ ). The paths from prior experience (standardized  $\beta = 0.400$ ,  $t=1.979$ ) and international experience (path coefficients 0.745,  $t=4.401$ ) to effectuation remained strong and significant. However, the path from prior experience to causation changed to be strongly negative and significant (path coefficients -0.210  $t=1.769$ ,  $p<0.10$ ). The path from effectuation to financial performance remained insignificant, similar to the path from causation to internationalization. The  $R^2$  value of causality rose to 0.213 ( $t= 2.252$ ) and for effectuation, degree of internationalization and financial performance the  $R^2$  - values remained the same, 1.000, 0.141 ( $t= 2.323$ ) and 0.054 (insignificant) respectively.

This finding of the reciprocal relationship which appeared to be unique, will be discussed later in the discussion chapter.

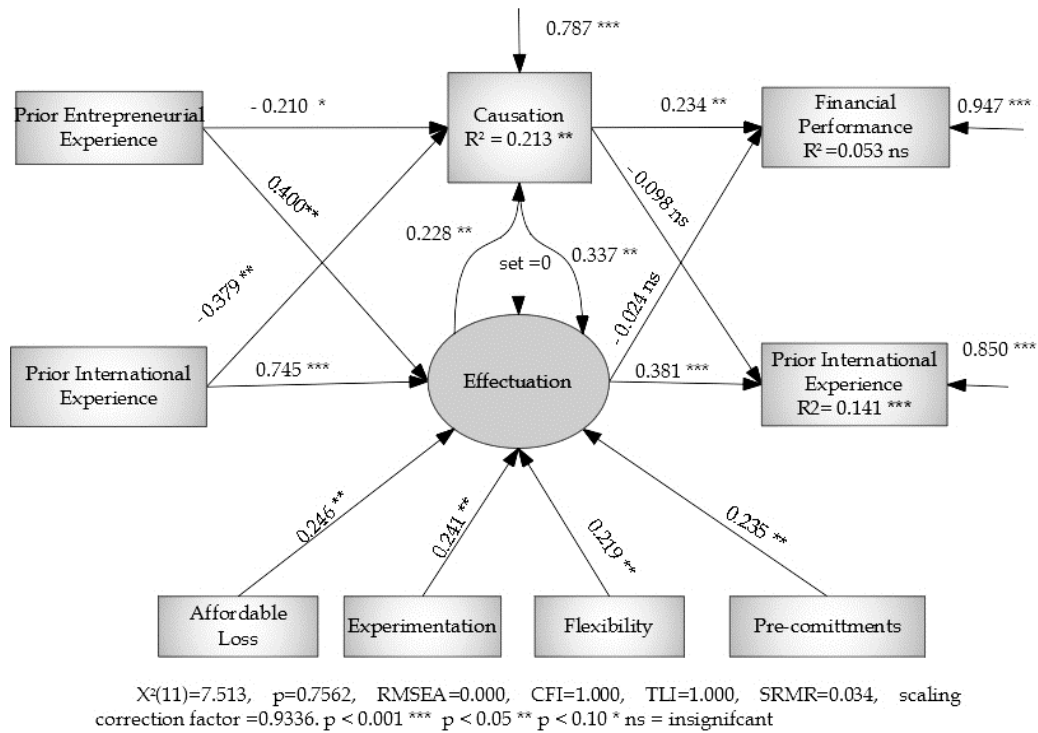


FIGURE 14 The estimated formative factor weights, residual variances, R<sup>2</sup>-values, and path coefficients for a recursive mode

The mediation effects of effectuation and causation were studied. If effectuation and causation would be mediators between prior entrepreneurial experience and financial performance and degree of internationalization, it stipulates direct effects from prior entrepreneurial experience and to degree of internationalization (Wu & Zumbo, 2008). In order to find out those direct effects of prior entrepreneurial experience and prior international experience on financial performance and degree of internationalization, a simple path model was created. It turned out that all other direct paths were insignificant except the path from prior international experience to degree of internationalization. The path (standardized  $\beta = 0.263$ ,  $t = 3.161$ ) indicated that international experience had noteworthy positive and significant ( $p < 0.001$ ) effect on degree of internationalization. Based on that mediating effect would be existing only between prior international experience and degree of internationalization. To find the possible mediation effects of effectuation and causation between prior international experience and degree of internationalization via effectuation and causation, it requires estimation of both direct, and indirect paths via mediators using a measurement model. Several models were constructed by adding direct links to the original measurement model which was depicted in FIGURE 10. The direct links were added into the model, and in order to have the model identifiable, several constraints, i.e. set to equity, had to be added to model coefficients. This caused the model to become unstable and the results were unreliable and unconvincing. Results were dependent on which coefficients constraints were added. This is a general difficulty in measurement models

based on formative constructs as indicated in literature (Bollen & Diamantopoulos, 2017; Diamantopoulos, 2011; Temme, Diamantopoulos, & Pfegfeidel, 2014). Because the model was not satisfactory, it was decided that the mediator effects will not be incorporated into the study.

### **6.7.1 Assessment of the effectuation and causation constructs in the ESEM model**

The assessment of the overall model fit for each construct in the ESEM framework of the measurement model is presented next. Testing of the model fit which was done above, was based on the use of the  $\chi^2$  - test supported with goodness-of-fit indices RMSEA, CFI, TLI and SRMR. The reliability of the scales was evaluated using Cronbach's alpha and the internal consistency using composite reliability. The values of Cronbach's alpha should be above 0.7 (Gefen et al., 2000; Tavakol & Dennick, 2011), or above 0.6 (Metsämuuronen, 2009). The composite reliability value should be above 0.7 with each item having reliability above 0.5 (Fornell & Larcker, 1981). The item reliabilities were evaluated using squared multiple correlations ( $R^2$ ). These values should be over 0.7 (Gefen et al., 2000). The construct validity evaluation was based on the method proposed by Fornell & Larcker (1981). They have proposed a method, in which the convergent validity is evaluated by examining the average variance extracted (AVE), which should be more than 0.5. Further, the discriminant validity was evaluated by investigating the square root of the AVE of every construct which should be more than the correlation of that construct with other constructs.

The testing of the fit of the original model in ESEM with all items of the constructs revealed that some items of the constructs were loading poorly on the constructs. Hence, the items having a loading below 0.4 and the significance of which were insignificant, were removed from the construct if their removal could be justified without destroying their meaning to the corresponding construct. This can be done because all first order constructs in the constructs, both for effectuation and causation, are reflective and in a reflective construct all items are interchangeable, and the latent reflective construct exists independently of measurement items (Diamantopoulos, 2006). By doing this, Cronbach alpha values may change. Still, the construct validity remains unchanged even if a single indicator is removed, because all facets of a unidimensional construct should be adequately represented by the remaining indicators (Jarvis et al., 2003). Hence, after reviewing the original model and the factor loadings, there were several items which had either insignificant or low loadings, or both on their expected factors indicating that the variables had small all no contribution on the factors. Similarly, by observing the  $R^2$  -values (squared multiple correlations) of the variables it was seen that some of those were statistically insignificant. Those were CA2 (standardized loading= 0.111, SE= 0.125), CA3 (standardized loading= 0.484, SE= 0.000), CA6 (standardized loading= 0.485, SE= 0.000), EX2 (standardized loading= 0.622, SE= 0.000), FL2 (standardized loading= 0.107, SE= 0.502), PC1 (standardized loading= 0.361,

SE= 0.000), PC2 (standardized loading= 0.376, SE= 0.000), and PC3 (standardized loading= 0.601, SE= 0.000). Those items were removed from the ESEM model.

The  $R^2$  -value for effectuation was 1.000 because it is a formative construct and the four sub-constructs of it account for the variance of it totally. Factor loadings, their standard error, item reliabilities ( $R^2$ ), composite reliabilities, Cronbach's alpha and average variance extracted (AVE) could be calculated for all constructs. The summary of the analyses is presented in TABLE 31.

TABLE 31 Standardized factor loadings, standards errors, item reliabilities, Cronbach's alpha and average variance extracted (AVE) for all constructs

Factor/item	Loading	Standard error	Item reliability ( $R^2$ )	Composite reliability	Cronbach's alpha	average variance extracted (AVE)
Causality				0.728	0.738	0.402
CA1	0.656	0.094	0.476			
CA4	0.696	0.088	0.522			
CA5	0.616	0.113	0.395			
CA7	0.560	0.126	0.375			
Affordable Loss				0.840	0.845	0.638
AL1	0.880	0.068	0.828			
AL2	0.803	0.066	0.633			
AL3	0.703	0.088	0.539			
Flexibility				0.620	0.639	0.358
FL1	0.633	0.255	0.410			
FL3	0.680	0.341	0.550			
FL4	0.459	0.124	0.316			
Experimenting				0.824	0.824	0.611
EX1	0.788	0.110	0.700			
EX3	0.711	0.072	0.517			
EX4	0.841	0.070	0.714			
Pre-commitments				0.0.774	0.779	0.534
PC4	0.721	0.103	0.595			
PC5	0.804	0.092	0.657			
PC6	0.661	0.089	0.459			

Examining the results reveals that standardized factor loadings, even though all are significant, tend to be low ranging from 0.459 (FL4 loading on flexibility) to 0.880 (AL1 loading on affordable loss). Composite reliabilities ranged from 0.620 to 0.840. As described earlier, generally the limit of acceptable value for the composite reliability is 0.7. Cronbach' alpha values ranged from 0.639 (flexibility) to 0.845 (affordable loss). All, except flexibility (alpha = 0.639) were above the limit of acceptable value of 0.7 which is considered the lowest value for that coefficient. Dropping an item of the scale of flexibility did not suggest that it would make the alpha value higher. However, as suggested in literature,

even the value of 0.6 would be acceptable (Metsämuuronen, 2009). Hence, it was decided that flexibility with the lower alpha value would be acceptable.

Item reliabilities, the  $R^2$  -values (squared multiple correlations a.k.a coefficient of determination) of the variables were mostly substantial ranging from 0.316 (FL4) to 0.828 (AL1), and all of them were statistically significant.

Average variance extracted (AVE) values were for some constructs below the accepted limit of 0.5. All others were above the limit, but causality had the AVE value of 0.402 and flexibility value of 0.358. This may suggest poor convergent validity for these two constructs. By definition, the low value of AVE may indicate that the variance of the these two constructs is caused mostly by the error terms of the observed items, not by real reflection of the latent factor measured with those items, because “AVE is the average amount of variation that a latent construct is able to explain in the observed variables to which it is theoretically related” (Farrell, 2010, p. 324). In order to have AVE’s on the accepted level, every effort was done. Those measures included both dropping some additional observed items having the largest measurement error variance, and also dropping cases from analysis as instructed in literature (Farrell, 2010). However, even though AVE value of flexibility for the second order construct of effectuation was low, it cannot easily be dropped from the structure of the formative construct. As stated in literature, “it is important to remember that sub-dimensions should not be eliminated unless all of the essential aspects of the focal construct domain are captured by the remaining sub-dimensions. Instances where an entire sub-dimension can be dropped without eliminating an essential aspect of the construct domain will probably be rare” (MacKenzie et al., 2011, p. 316). Moreover, any of the sub-dimension as a part of a formative construct of effectuation cannot be removed from the measurement scale without violating the formative construct as a whole (Sarstedt et al., 2014). For this reason, flexibility was retained in the effectuation construct. Similarly, because dropping causality from the research would ruin the whole work, it was decided to retain causality construct.

Both these limitations will be later discussed in the reliability and validity assessment in Section 6.7.2 of the research, and also in the Section 7.4 when the limitations of the research are discussed.

### **6.7.2 Validity and Reliability of the SEM Constructs**

The reliability of constructs themselves was validated. The constructs were both reflective and formative in nature. The validation of the constructs in formative measurement models requires a different approach than validation of the constructs in reflective measurement models. In other words, conventional validity assessments, conducted for reflective models, do not apply directly to formative measurement models, and the concepts of reliability and construct validity are not meaningful when employing such models (Cenfetelli & Bassellier, 2009; Jarvis et al., 2003; Petter, Straub, & Rai, 2007). Regarding the reliability assessment, Jarvis, MacKenzie & Podsakoff (2003, p. 202) contend that “measures of internal consistency reliability should not be used to evaluate



the adequacy of formative indicator models". What is normally used in the context of reflective indicators, is the use of internal consistency reliability. It can be measured using Cronbach's alpha, or composite reliability. However, to evaluate the adequacy of the measures of formative models those measures are not deemed appropriate or adequate (Petter et al., 2007).

The construct validation process is "to evaluate whether responses to the scale behave as one would expect if they were valid indicators of the focal construct" (MacKenzie et al., 2011, p. 317). According to them, there are four objectives in the evaluation of the indicators of the construct. Firstly, one must evaluate, if the scales are accurate representations of the underlying construct. Secondly, do the scales adequately capture the multidimensional nature of the construct. Thirdly, are the scales distinct from the indicators of other constructs showing discriminant validity. Fourthly, are they related to the measures of other constructs specified in the constructs theoretical network and capable of showing nomological validity.

In the current research in hand the assessment of the validity and reliability of the constructs, both reflective and formative, is based mainly on proposals and recommendations of Clauss (2017), Edwards (2001), and Jarvis, MacKenzie & Podsakoff (2003) where applicable. However, not all their methods were used.

#### **6.7.2.1 Nomological validity**

The nomological validity of the constructs "is the degree to which constructs that are theoretically related are also empirically related. To show nomological validity, the developed scale should be able to reproduce previously theoretically or empirically established relationships" (Clauss, 2017, p. 398). The nomological network of the current research in hand is depicted in FIGURE 7. It contains the exogenous and endogenous constructs of the research model. In that nomological network, effectuation and causation have the role of both exogenous and endogenous constructs. Moreover, effectuation as formative construct, is causing additional challenges to assess the validity. The vast majority of the scale validation procedures in the literature are concentrating in reflective constructs, and the recommendations and instructions made for reflective indicators, and if applied for formative models, they may weaken formative constructs (MacKenzie et al., 2011). If, for example, items in the construct having low item-to-total-correlations are dropped from the scale to have a better internal consistency reliability, it may lead to situation where vitally important items were eliminated and ruining the empirical and conceptual meaning of that construct. In the current research in hand the constructs in the nomological network were based on the pivotal research work of Sarasvathy (2001b) and Chandler et al. (2011). The additional endogenous parameters of financial performance and degree of internationalization, and exogenous parameters of prior entrepreneurial experience and prior international experience were added into to the network as single item formative indicators based on the research propositions and research questions.

The assessment of the nomological validity for the reflective and formative constructs can be conducted according to the same procedure (MacKenzie et al., 2011). It comprises estimating the latent constructs in the network, and testing whether the relationships between the constructs and their hypothesized antecedents and effects are significantly different from zero. The statistical significance is the key for the nomological validity of the model. If those paths are significant it suggests that the focal construct behaves as hypothesized in relation to the other variable in the model. The magnitudes of those paths give an indication of the strengths of those relationships.

In the current research the relationships of the model were verified from the results of SEM estimations. As reported, most importantly, the paths from the sub-dimensions of effectuation were significant. Moreover, the path from effectuation to degree of internationalization, and path from causation to financial performance were both significant, similar to paths from prior entrepreneurial experience and prior international experience to effectuation. Only the paths from effectuation to financial performance, from causation to degree of internationalization and the links from prior entrepreneurial experience and prior international experience to causation were insignificant. The standardized magnitudes of the significant paths were noteworthy. Hence, based on these results, it could be judged that the model possessed nomological validity because the effectuation construct was constructed statistically significantly by its sub-dimensions as expected, and even though some of the hypothesized paths were insignificant, which were to test the hypotheses of the research using the developed model, indicated the usability of the model.

The nomological validity of the effectuation with its sub-dimensions was verified according to the instructions by MacKenzie, S. B., Podsakoff, P. M. & Podsakoff, N. P. (2011). As they propose, the adequacy of the multidimensional structure of the effectuation was assessed by testing whether the effectuation sub-dimensions have significant direct effects on the financial performance and on degree of internationalization. Each of the sub-dimensions, affordable loss, experimentation, flexibility and pre-commitments, were connected via a direct path separately, one-by-one, to financial performance and degree of internationalization, because of the identification of the model not all could not be added at the same time. An example of the model used to test the direct effect of flexibility on financial performance and degree of internationalization by adding direct links from flexibility to them, is illustrated in FIGURE 15.

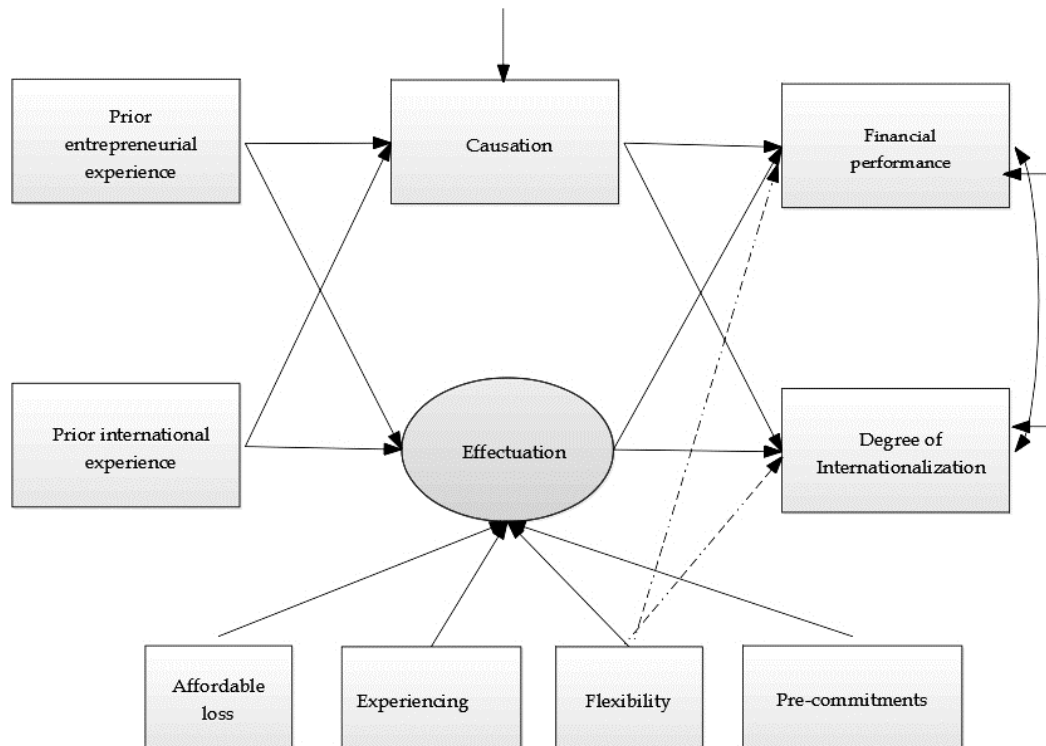


FIGURE 15 Nomological validity testing model (flexibility as an example)

TABLE 32 Nomological validity  $\chi^2$  test results

	$\chi^2$	Degrees of freedom	p-value
Affordable loss	1.542	2	> 0.3
Experimentation	1.077	2	> 0.5
Flexibility	4.206	2	> 0.1
Pre-commitments	0.216	2	> 0.9

The significance of these direct paths was tested with  $\chi^2$ -difference test with and without these paths. The results of the  $\chi^2$  - difference tests are represented in TABLE 32. The function of the latent formative construct is to fully mediate the effects of its sub-dimensions to all outcome variables. If some of those direct links appears to be significant then there is a reason to doubt of its validity. The results of the  $\chi^2$  difference test revealed that the adding the direct links did not improve the model and the direct effect of each sub-dimension on the effects was insignificant. These suggest that all sub-dimensions of effectuation that are theoretically related to the focal construct were valid in the nomological context.

#### 6.7.2.2 Convergent validity

Jarvis, MacKenzie & Podsakoff (2003) make separation between reflective and formative construct assessments. For the first order reflective constructs, like causality and all four sub-dimensions of the second-order effectuation construct in the current research in hand, they propose to assess the convergent and

discriminant validity by studying the AVE values of the construct. Hence, the convergent validity and discriminant validity evaluation were based on the method suggested by Fornell and Larcker (Fornell & Larcker 1981). In this method, the convergent validity is assessed by examining the average variance extracted (AVE). It should be more than 0.5 because then it suggests that the latent construct is able to account for the majority of the variance of the indicators. Based on the AVE values, all constructs except causality and flexibility indicated good convergent validity. The value of AVE for causality was 0.402 suggesting a low value for the percentage of the variance of the items it can account for. Similarly, the AVE of flexibility was 0.358 being below the 0.50 threshold value. Hence, both of these could account for only less than half of the variance of their corresponding observed items. However, it was found out that quite recently low AVE values have been detected also in other research settings for the effectuation construct (Smolka et al., 2016). Because both flexibility and causality were critical constructs in the formative construct in assessing the existence of effectuation and causality in the current research in hand they were retained in spite of the suspicious low AVE value. This will be discussed later in the limitations part of this research.

### 6.7.2.3 Discriminant validity

Further, the discriminant validity of reflective constructs was assessed using the process described by Fornell and Larcker (Fornell & Larcker 1981), by examining the square root of AVE of every construct which should be more than the correlation of that construct with other constructs. The AVEs, square roots of AVEs and correlations of the constructs are presented in TABLE 33. Square roots of AVEs are bolded on the diagonal and the correlations in the lower triangle. Based on this method, all constructs were able to show good discriminant validity.

The assessment of the validity of the second-order formative construct having four reflective sub-dimensions was done according to the instructions by Jarvis, MacKenzie & Podsakoff (2003). They propose that after the assessment of the reflective sub-dimensions has been done based on the use of AVE, the adequacy of the formative construct using the adequacy coefficient (Edwards, 2001). The adequacy coefficient, or squared canonical structure coefficient,  $R_a^2$  is the square of the structure coefficients which can be used to assess the relations between the observed items and the latent factor in a formative construct. This statistic indicates the proportion of variance of an observed variable linearly shares with the formative variable generated from the observed variable set (Edwards, 2001). It is calculated by summing the squared correlations between the effectuation sub-dimensions and the effectuation construct itself and dividing the sum with the amount of the sub-constructs (four). It is analogous with the coefficient of determination ( $R^2$ , reliability coefficient) in the context of assessment the quality of the constructs. The  $R_a^2$  coefficient was 0.345 meaning that 34.5 percent of the variance of the sub-constructs is accounted for by the focal formative construct of effectuation.

It should be above 0.5 so that half of the variance of the items are accounted for by the construct (Edwards, 2001) .

TABLE 33 AVEs, square roots of AVEs (on diagonal), correlations of the constructs (lower corner), squared correlations of sub-dimensions with focal construct  $c^2$  and adequacy coefficient  $R_a^2$  for effectuation

Construct	AVE	1	2	3	4	5	$c^2$
1 Causality	0.402	<b>0.634</b>					
2 Affordable loss	0.638	0.135	<b>0.799</b>				0.278
3 Flexibility	0.358	0.103	0.206	<b>0.598</b>			0.452
4 Pre-commitment	0.534	0.235	0.089	0.220	<b>0.731</b>		0.373
5 Experimentation	0.611	0.039	-0.098	0.192	0.119	<b>0.782</b>	0.276
Effectuation	-	0.527	0.672	0.611	0.525	0.527	$R_a^2=$ <b>0.345</b>

In the literature there are advices on how to perform validity assessment of the constructs in SEM before the structural modeling and path estimations are performed (MacKenzie et al., 2011; Sarstedt et al., 2014). They all emphasize the importance of the valid measuring instrument in SEM analyses.

The correlations among the effectuation sub-constructs were low, ranging from -0.098 to 0.235. For formative construct, correlations between the sub-constructs is not a prerequisite, on the contrary, it would be consistent for formative construct if indicators, in the current research in hand sub-dimensions of effectuation, would be totally uncorrelated with each other (Jarvis et al., 2003). Hence, it was decided that the sub-dimensions of the effectuation construct are consistent and the structure of it was acceptable.

The discriminant validity was checked using Wald -test which is a  $\chi^2$  - difference test to examine whether the factors are discriminant, or are they somehow combined or mixed with each other. It is a pair-wise test between two models where the correlation of the two constructs under test are set to value of unity which means a full correlation between them in the other model, and the correlation is freely estimated in another model. The significance of the difference between those models is tested with the  $\chi^2$  difference test. If the test result is significant meaning the correlation between the constructs is significant, one can assume that constructs are discriminant (Wald, 1943). The results of the test are presented in TABLE 34.

TABLE 34 Results of discriminant validity  $\chi^2$  difference test

Factor pair	$\chi^2$	Degrees of freedom	p-value
Experimentation – affordable loss	20.073	1	0.0000
Experimentation – flexibility	17.068	1	0.0000
Experimentation – pre-commitment	5.671	1	0.0173
Affordable loss – flexibility	9.799	1	0.0017
Affordable loss – pre-commitment	9.567	1	0.0020
Flexibility – pre-commitment	12.904	1	0.0003
Causality – experimentation	8.120	1	0.0044
Causality – affordable loss	3.993	1	0.0457
Causality – flexibility	24.722	1	0.0000
Causality – pre-commitment	4.668	1	0.0307

The results reveal that all differences are significant at level  $p < 0.05$ . These suggested that constructs have acceptable discriminant validity.

#### 6.7.2.4 Reliability

For the formative constructs, traditional reliability, assessed with internal consistency in the form of composite reliability, is not a desirable feature of the constructs (Petter et al., 2007). Hence, the multicollinearity which causes the high internal consistency scores was assessed. Multicollinearity of the items of the effectuation constructs (experimentation, affordable loss, flexibility, and pre-commitments) was assessed by checking the variance inflation factor (VIF) to determine, if the measures are too highly correlated (Petter et al., 2007). Traditionally, if the VIF statistics is greater than 10, then multicollinearity may be a concern. However, for formative constructs multicollinearity is more harmful than for reflective constructs. For this reason, the limit for the VIF values has been proposed to be set to be  $VIF = 3.3$  (Petter et al., 2007). No collinearity among the effectuation items could be suspected because all VIF values were between 1.236 – 2.074, and no one was above the proposed limit of 3.3 for formative constructs. Similarly, multicollinearity for the causality items was assessed. The VIF values for causality items was between 1.134 – 1.351. All VIF values were below the limit of  $VIF = 10$  for reflective constructs. Hence, it could be stated that multicollinearity was not an issue for the constructs.

As instructed in the literature (MacKenzie et al., 2011) to validate the research constructs, the reliability of the items of the constructs and the constructs themselves were validated. To accomplish the evaluation of the reliability of the items, the composite reliability values were examined. The reliability of the constructs was evaluated by examining the Cronbach's alpha and composite reliability. The values of Cronbach's alpha indicated good reliability of the first order constructs because all other alpha values were above 0.7 except that of flexibility (alpha =0. 639). The values of Cronbach's alpha should be above 0.7 (Gefen et al., 2000; Tavakol & Dennick, 2011). However, it has been proposed that values above 0.6 are acceptable (Metsämuuronen, 2009). Hence, the reliability results indicated good reliability of the items as all composite reliabilities were above the threshold of 0.6.

The low reliability values of effectuation sub-dimension flexibility were reviewed closer. In the literature there are plenty of concepts about the reliability assessment of the formative constructs, because traditional notions of internal consistency reliability do not apply to the set of sub-dimensions of formative second-order construct, like effectuation in the current research in hand (Edwards, 2001; MacKenzie et al., 2011). The first order sub-constructs of those constructs can be evaluated as has been done above. However, as stated by Edwards (2001, p. 160) "reliability is not an issue of debate when a multidimensional construct and its dimensions are treated as latent variables that contain no measurement error". In the estimations of the current research in hand the latent effectuation construct was set to have no measurement error and it was set to zero in estimation because of the identification. Hence, it was concluded that reliability of the constructs was acceptable.

#### **6.7.2.5 Common method variance**

The Common Method Variance (CMV) means that part of the total variance is caused by the data collection method rather than with the variance resulting from the constructs as had been planned (Malhotra et al., 2006). CMV has been suggested to be very common in self-reported surveys in which respondents fill out the questionnaire at the same point in time. The consequences of CMV may be destructive to research because of the bias it causes. For this reason, in the research in hand CMV was controlled in several ways. Firstly, the items in the questionnaire were mixed so that the items belonging into the same construct were spread over the whole length of the questionnaire in a random order. Secondly, it was ensured that the items were not in the hypothesized order from antecedent to consequences. Thirdly, the control variables were requested separately in the end of the questionnaire. Fourthly, one of items (EX2) was reversed in order to avoid response bias to the respondent's style to give answers. Fifthly, CFA marker technique (confirmatory factor analysis marker technique) which has been developed for structural equation modeling (SEM) was used to detect possible CMV. CFA marker technique is based on the use of marker variables in questionnaire (Richardson et al., 2009; Williams et al., 2010). The idea is that the CMV can be detected using  $\chi^2$  -difference test in SEM analysis by comparing the change in a model fit between a model in which the loadings of the marker construct items are freely estimated to the model which they are constrained to value of zero. The marker variables must be theoretically unrelated to the substantive variables under examination and must be added into the questionnaire before data collection.

In the current research in hand the marker variables were taken from the analysis of the attitudes and beliefs towards hypnosis (Capafons et al., 2004). By doing this, it was believed that the marker variables are theoretically unrelated to the substantive items of the research. The variables were coded similar to all other items using seven-point Likert-scale.

Marker variables were as follows:

- C1 *Hypnosis may be very helpful to others*
- C10 *Hypnosis can be of great assistance in a psychological treatment.*
- C12 *Hypnosis is a complement or tool to help psychological therapies.*
- C22 *Hypnosis makes therapeutic results easier*

The CFA marker techniques analysis was conducted and estimated in CFA framework according to the methods described in the literature (Rafferty & Griffin, 2004). The  $\chi^2$  -difference test suggested that there was no difference between a model fit in which the loadings of the marker construct items are freely estimated to the model fit which they are constrained to value of zero ( $\chi^2(16) = 10.44153, p > 0.8$ ). This result rejected the possible assumption of the bias in the estimations caused by the common method variance. For illustration purposes the CFA marker technique factors with loadings are demonstrated in FIGURE 16.

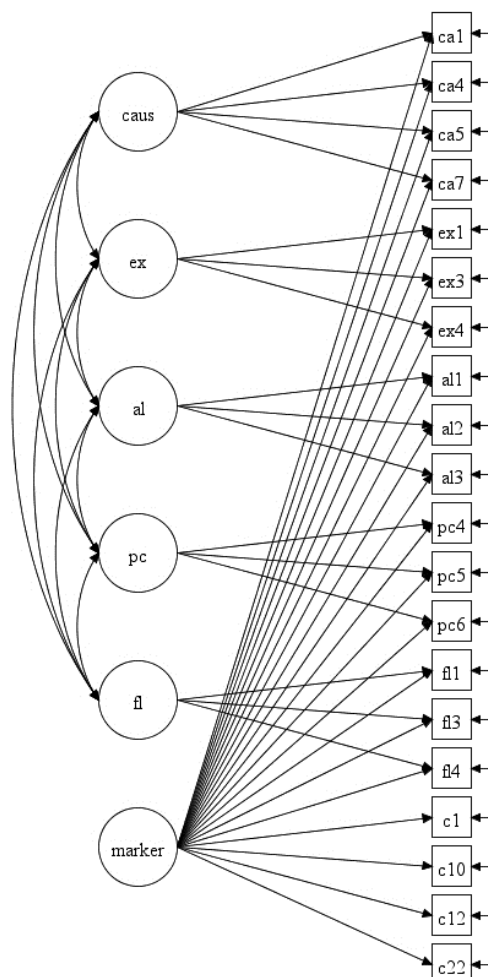


FIGURE 16 CFA marker technique factors (illustration purposes only)



The have methodological triangulation for CMV testing, also Harman's single factor test was performed in the EFA (explorative factor analysis) framework using the method as suggested in the literature (Malhotra et al., 2006). In the test all items are constrained to load onto a single factor. The test results indicated that the single factor model did not fit the data ( $\chi^2(104) = 550.353$ , scaling correction value = 0.8581, p-value = 0.000). The supporting goodness-of-fit did not support the fit either (RMSEA = 0.196, CFI = 0.000, TLI = - 0.189, SRMR = 0.154). Acknowledging the limitations of the Harman's single factor test, these results supported the rejection of the possible assumptions of the bias in the estimations caused by the common method variance.

## 6.8 Review of the Results

The survey was sent to 800 founders and co-founders of the Finnish KIBS start-up companies by e-mail. The data of the questionnaire included responses from 112 subjects. There were very little missing values in data, and for this reason no imputing was used. The data was screened for kurtosis and skewness. It was detected to have kurtosis and skewness which were defeated by selecting the robust ML-estimator to be used in the estimations of the parameters in ESEM (explorative structural equation modelling) analysis. The outliers were also screened to find out if any of the respondents' records would be classified as outliers using Mahalanobis distance and the significance of it using  $\chi^2$  (chi squared) distribution. Item values which were found outliers were not deleted but their values were replaced by the variable means. The reliability and validity of the constructs were verified with several tests indicating that the constructs were consistent and reliable. Both Cronbach's alpha and composite reliability values were used to assess the reliability of the constructs. Convergent validity was tested using the average variance extracted values (AVE) and  $\chi^2$  -difference tests for all first order constructs and sub-constructs. Validity of effectuation was assessed using the adequacy coefficient,  $R_a^2$ . Nomological validity of the formative effectuation construct was assessed using  $\chi^2$  -difference tests. In spite of the fact that some constructs were showing low values for AVE, Cronbach's alpha and composite reliability, the tests suggested that constructs possessed construct and discriminant validity and were convergent with the theoretical nomological network. No multicollinearity was detected in data. After the model was accepted the means of the effectuation and causal items was calculated in order to find out which one is a prevailing decision-making logic. The mean score of effectuation indicated that respondents were more effectuation driven (mean = 3.18, S.E.= 0.08) than causality driven (mean = 3.66, S.E. = 0.12).

The estimation of the model was done using ESEM (explorative structural equation modelling) resulting the acceptable fit with research data. The resulting factor scores of the constructs were stored and were used in the SEM analysis of the final parsimonious SEM model. The testing of the model resulted

acceptable fit. Model was able to explain 14.2 percent of the variance of the internationalization but was not able to explain the variance of financial performance of the company. The bias based on common method variance was proved not to exist in data. As a summary, using the model, three of the four hypotheses postulated were supported.

## **6.9 Summary**

In this chapter the descriptive results of data were presented first. The means, standardized deviations and medians were presented for all items of the measurement scales. Then ESEM analysis was presented with the resulting factor scores for causation and effectuation. Parameter estimations were performed to test the models fit using SEM analysis utilizing the parsimonious research model. Then the results were presented. The effectuation and causation constructs together with their validity and reliability were assessed. Common method variance was analyzed and it was found that the results were not biased due to the common method variance. In the end, the results were reviewed.

The following chapter includes the concluding discussion, added with sections where the main findings are summarized and discussed, giving results of the hypotheses testing and finally answers to the research questions. Then theoretical contributions, implications to practitioners and limitations are addressed and discussed. Finally, proposals for future work and a summary are presented.

## 7 CONCLUDING DISCUSSION

This chapter includes the discussions and conclusions regarding the main results of the study. In the beginning the main findings are summarized and discussed, giving results of the hypotheses testing and finally giving answers to the research questions. Then the theoretical contributions, implications and limitations are addressed and discussed. Finally, proposals for future work and the summary are presented.

### 7.1 Discussion on Main Findings

This study was divided in two main parts, qualitative and quantitative parts. Both of them had their own specific methods to find support for the research propositions and answers to research questions. The primary method in the study was mixed methods research utilizing sequential exploratory strategy model. It has been suggested to be used for testing immature theories (Morgan, 1998). Moreover, sequential exploratory design has been proposed as a procedure to develop foundations even for a new instrument if the existing instrument is not adequate (Creswell, 2009). It is a straightforward method not only to design the research but correspondingly to report research results. According to Creswell (2009) it is suitable for exploring a phenomenon and enlarging qualitative findings, mixing also the results of the two methods supporting each other.

In the beginning of this research, based on the literature review, four research propositions were suggested. The purpose of the research propositions was to establish the foundations for the further work to find answers to the original research questions because in the literature review the research results were found to be inconsistent, and because one of the main research interests, effectuation, is still under debate of its status (Arend et al., 2015; Dew et al., 2016). In order to seek support for the propositions to validate them, a qualitative analysis was made based on the interview data of ten KIBS start-up founders and co-founders. Data collection in the interviews was based on critical incident technique (CIT) to discover those actions what an entrepreneur

has to take in his or her start-up to find new directions and business possibilities. When those critical incidents were found and coded, data was delved into to find effectual and causal actions, which were then coded into categories and sub-categories. Coding was based on the existing literature on effectuation and causal logic. In this way totally 211 actions were found and coded of which 173 were rated as effectual and 38 as causal. Finally, those findings were validated against literature using verbatim excerpts from interviews to compare those to coded category definitions, and were finally verified using statistical methods. Research propositions RP1, RP3, and RP4 were verified, and RP2 was partially verified.

The presented results from the qualitative part clearly showed support to the research propositions. After the research proposals were verified, four hypotheses were set to find answers to the four research questions using quantitative analysis. As a part of the quantitative analysis ESEM modelling was made using data collected for that purpose. ESEM estimation was able to confirm the fit of the measurement model with data confirming the latent factor structures of causality and effectuation. Further, using SEM, the regression paths from prior entrepreneurial experience and prior international experience to causation and effectuation, and further, the paths from causation and effectuation to financial performance and degree of internationalization were estimated. Hypotheses H1, H3 and H4 were supported, and hypothesis H2 was not supported.

As a part of the qualitative analysis the interviews of ten founders and co-founders of Finnish KIBS companies which were founded between 2002-2017 were performed. Respondents were asked to recall a few critical incidents in the beginning of their entrepreneurial career in the founding phase of the company. Totally 42 critical incidents were recorded. To have a conception of the temporal dimension of the content of the process also the time in terms of the different phases of the company was stored and coded later in the analysis. It turned out that most of the incidents (12) were recorded to happen in the pre-start-up phase (28.6 per cent) even though the distribution between the phases was very balanced. This equipoise is an indication of the continuous need for the scrutiny of the direction and course of the start-up in finding the solutions for the new products, new customers, or even pivoting the whole company for totally different type of operations, as these critical incidents seemed to appear any time during the building up the new venture. When compared incidents between different functions of the company, most of those were business development related (24 incidents, 57.1 per cent of all incidents). This is understandable because in the beginning the business may be very unclear to an entrepreneur, and he or she may consider several options to proceed to create the sustainable and long-term solution. This division is in line with other studies using the same CIT methodology in entrepreneurial behavior studies (Chell & Pittaway, 1998; Vershinina et al., 2017). Product and HR functions became next biggest areas of the company. Surprisingly, financing was the smallest field where there were critical incidents (4 incidents, 9.5 per cent of all).

One explanation may be that this result is biased by the use of established companies in the research and which have survived already from the financing issues. However, as the recent query among the growth companies in Finland, funding was estimated as the biggest obstacle for the growth (Huovinen, 2018).

After coding all entrepreneur's actions, frequencies and divisions between companies of all critical incidents were contemplated closer. Actions were classified using pre-defined codes for effectuation, causality and "other" classes. There were five pre-defined categories for effectuation and four categories for causation. For effectuation four main dimensions were used (Dew et al., 2009; Read et al., 2009; Reymen et al., 2015) added with pilot in plane -dimension (Society for Effectual Actions, 2018) which was coded as controlling own activity. Therefore, for effectuation the following five codes were used: affordable loss, means oriented, partnerships, leverage unexpected, and control of own activity. Similarly, for causation following four codes from existing literature (Dew et al., 2009) having developed for detecting causation were used: expected returns, goal oriented, competitive analysis, and avoid unexpected.

The descriptive results after coding revealed that there were totally 211 coded actions. The division between effectual and causal actions was 173 coded actions (82.0 per cent) and 38 coded actions (18.0 per cent) respectively. This suggests that effectuation is much more popular and frequently used logic to solve issues in KIBS start-ups. This finding was supported also in the quantitative part of the study. The means and standard deviations of the effectuation and causal items were calculated in order to find out which one is a prevailing decision-making logic. The mean score of effectuation indicated that respondents were more effectuation driven (mean = 3.18, S.D.= 1.27) than causality driven (mean = 3.66, S.D. = 0.83) supporting the outcome of qualitative analysis. This finding is supporting similar results in not so dissimilar studies (Eyana et al., 2017). Eyana et al. (2017) in their study among Ethiopian tourist start-ups report that they have found both effectual and causal behaviors and also their co-existence, and that the difference in favor of effectuation to causal behaviors was also statistically significant ( $t=2.214$ ,  $p < 0.05$ ,  $df= 117$ ).

Results of this study related that majority of the coded actions, 96 actions, took place in post-pre-start phase. The division between causal and effectual actions was 13 and 83 respectively. This is justified by the amount of effectuation codes for controlling own activity comprising 33 coded activities being the largest number of actions. In terms of effectuation, it is the a pilot in a plane- activity where an entrepreneur controls his or her own actions, not avoiding surprises, but utilizing contingencies.

An interesting finding is that the total number of coded actions grew steadily over time. It starts from 8 coded actions in idea phase and grows evenly to 96 coded actions in post-start-up phase having 50 and 57 actions in pre-start-up and start-up phases. This growth applied both effectuative and causal actions. This is contradictory to findings in literature where it is suggested that effectuation decreases over time, and causal dimension would be dominant in

later stages (Reymen et al., 2015; Servantie & Rispal, 2018). In their study among social enterprises, Servantie & Rispal (2018) claim that effectuation was deployed throughout the whole development process of the company, and that causation began in the expansion period and was more systematically used in stable periods afterwards. For the divergent finding in the current study in hand there might be several possible explanations. Firstly, most of the incidents classified effectual in the post-start-up phase seem to be control own activity - code totaling 33 codes out of 83 (39.7 per cent). It is almost double compared to other effectuation codes at the same phase. This indicates that in the post-start-up phase start-up may have tackled the obstacles of the start-up phase and are then interfacing the challenges of the tough business environment. In that phase they have to control their own operations in order to be able to survive in their business operations and pass the hardships. Actions may include e.g. controlling own price level for better profitability, for selecting projects based on own available resources, etc. Secondly, the companies of this study were still in the tutelage of their founders having a centralized decision-making policy without proper management processes. This may partly explain the large use of effectuation. Thirdly, the age of the start-up companies might partly explain this phenomenon. If the company is very young, it might not yet have developed itself into the phase where effectuation would decrease and causality would increase as suggested in prior literature. However, in the present study the mean age of a company was 7.5 years and hence, this is not explaining this. Fourthly, quite recently it has been suggested that the breakeven point, the point where total costs and total revenues of a start-up are equal, would be the time when the transition from effectual decision making to causal decision making happens (Lin, 2017). This suggests that all companies would have been below their breakeven point in all phases. This could not be verified because this information was not requested separately for each phase, only the current state. Fifthly and finally, the respondents may have recalled those critical incidents which happened in the post-start-up phase better than those which have happened in earlier phases in the past. This might be an indication of possible bias in the respondents' answers. However, this divergent finding remains without a proper explanation and remains a subject of future studies.

The second frequent coded actions happened in pre-start-up and start-up-phases accounting for 50 and 57 coded actions from total 211 actions. The number of effectual actions (38 for pre-start-up phase, 46 actions for start-up phase) was bigger than the corresponding number of causal actions (12 for pre-start-up phase, 46 actions for start-up phase). The most common effectuation actions in those two phases were for means oriented which gained the values of 16 and 18, and value of 19 in post-start-up phase, but only 3 actions in idea phase. This suggests the strong indication of the existence of the first effectuation dimension, describing own resources "Who I am", own knowledge and networking possibilities "Whom I know" (Dew et al., 2009, p. 299). This finding underpins the prior presumption that in the context of KIBS companies

the emphasis is on entrepreneur's own knowledge, human capital and on existing networks (Kemppilä & Mettänen, 2003).

When causation actions are examined closer the absolute number of them appears to be smaller than that of effectuation as stated above. The distribution between different actions in causation category is even between the phases of a start-up, except one anomaly in idea phase. In the idea phase there are only 2 causal actions whereas in other phases the amount is shared between 11 - 13 actions. In idea phase these 2 actions were coded as goal oriented actions. This suggests that causal behavior is not the prime behavior in idea phase compared to other phases but when that behavior is performed, it is the prime behavior to plan and set predefined goal to be achieved. This is supporting the findings in previous studies where the causal behavior is strong and significant behavior in proceeding towards a preset goal.

The results of the qualitative analysis of the present study in hand verified the research propositions, and made it possible to create hypotheses for the analysis in the form of quantitative analysis. These both added knowledge about the characteristics of causal and effectuation logics. Hence, the results for their part response to calls for contributions on quantitative analyses to contribute on effectuation and causation research.

In the quantitative part of the study the test accepted the fit of the measurement model with data. The structural path from prior entrepreneurial experience to effectuation indicated that the effect of previous entrepreneurial experience to effectuation was positive, high and significant (standardized  $\beta = 0.406$ ,  $t=2.027$ ). This suggested that prior entrepreneurial experience had a significant effect on the use of effectuation logic. This finding was supported by the finding that path from prior entrepreneurial experience to causality (standardized  $\beta = -0.090$ ,  $t=-0.952$ ) indicated that prior entrepreneurial experience had no effect on using causal logic. Hence, hypothesis *H1, Prior entrepreneurial experience tends to guide entrepreneurs to use effectuation rather than causation* was supported.

Based on the supported hypotheses *H1*, the answer to the first research question *"To what extent does prior international experience of entrepreneurs effect on the decision-making processes in new venture creation?"* can be given. The results indicated that prior entrepreneurial experience is a strong predictor of utilizing effectual logic rather than causal logic in decision making in new venture creation. Hence, *the answer to the first research question is that prior entrepreneurial experience has a strong positive effect on the decision -making process in new venture creation in such a way that experienced entrepreneurs tend to utilize effectual logics rather than causal logic in their decision-making.* This assertion is fully in line with other findings in literature. Vershinina et al. (2017, p. 170) proposed an experiential logic, where "the entrepreneur looks inwards and draws the solutions to his or her problem from his or her own experience and is therefore thinking effectually". When thinking effectually, experienced entrepreneurs, as Veshinina et al. (2017, p. 170) put it, "look inwards", in other words try to find solutions, not looking for external solutions outside of his or her own experiential world, but inside the entirety of his or her experience of life. In this

way the entrepreneurial experience is transformed into knowledge, which can be utilized in effectual thinking and decision-making process. According to Politis (2005) entrepreneurial experience alone is not sufficient for learning to happen, but it requires that something is done with that experience. Hence, in addition to transformation there must be experiences to transform. The premise of the concept of entrepreneurial experience is that entrepreneur directly at least observes of, and in the best case by experiences participates in, those events related with new venture creation. The concept of entrepreneurial knowledge means the practical wisdom that is received from that specific experience. The process where the experience is transformed into knowledge is the way how entrepreneur is getting his or her benefits of earlier ventures to be utilized in new venture creation processes (Politis, 2005).

The path from prior international experience to effectuation was considerably positive and significant (standardized  $\beta = 0.756$ ,  $t=4.556$ ) suggesting that prior international experience had a strong positive effect on using effectuation logic. This finding was supported by the finding that path from prior international experience to causality (standardized  $\beta = -0.161$ ,  $t=-1.684$ ) indicated that prior international experience had a noteworthy negative effect on causal logic. These findings are totally in line with the findings in the literature suggesting that entrepreneurs with a large degree of international experience tend to use effectuation rather than causation in their decision making (Harms & Schiele, 2012). Hence, hypotheses *H3: International experience tends to guide entrepreneurs to use effectuation rather than causation* was supported.

This finding allows now to answer to the second research question "*To what extent does prior international experience of entrepreneurs effect on the decision-making processes in new venture creation?*". Entrepreneurs having international experience are familiar with the procedures how to operate internationally. The results indicated that prior international experience is a strong predictor of utilizing effectual logic rather than causal logic in decision making in new venture creation. Hence, *the answer to the second research question is that prior international experience has a strong positive effect on the decision-making process in new venture creation in such a way that entrepreneurs with prior international experience tend to utilize effectual logics rather than causal logic in their decision-making*. For this assertion there are evidences in literature that entrepreneurs who have existing relationships in foreign markets due to their experience in international business, tend to use effectuation to select and enter international market (Chetty et al., 2015; Harms & Schiele, 2012; Nummela et al., 2014). Moreover, it has been proposed quite recently that to successfully internationalize, a company needs to pay attention to those factors influencing the internationalization and growth, like international experience of managers, innovation capacity, marketing capacity, etc. (Paul et al., 2017). It has been suggested that the best predictor of whether a particular company is able to recognize a problem as relevant, is explained almost entirely by the number of years the company has been in exporting business (Paul et al., 2017). These may be explained by effectuation behavior of experienced entrepreneurs. When entrepreneurs have international experience in exporting business, for example,



they may possess better readiness to find solutions for their challenges compared to those without international experience. Combined this with entrepreneurial learning, these international experiences are transformed into knowledge to be used in growing the degree of internationalization. In this they may use effectuation logic rather than causal logic. Their process may include looking for right people among those they know, controlling their own activities to navigate passing by the pitfalls, and also estimate their financial limits they can afford. This may be explained using the concepts of intuitive and sensing learning (Corbett, 2005; Corbett, 2002). He postulates that the more individual's cognitive processing style moves toward intuitive learning and away from sensing, the more opportunities individual would identify. According to the main principles of effectuation, unexpected contingencies are exploited more easily by effectual entrepreneurs compared to causal entrepreneurs tending to avoid unexpected situations. Hence, the more opportunities an internationally experienced entrepreneur meet the more he or she will exploit when operating in the mode of effectuation logic.

The SEM analysis estimated the structural paths not only between effectuation, causation and their antecedents prior entrepreneurial experience and prior international experience, but also their consequences financial performance and degree of internationalization. The path coefficient from effectuation to internationalization was considerably positive and statistically significant (standardized  $\beta = 0.375$ ,  $t=4.609$ ). At the same time the path coefficient from causality to internationalization was small and insignificant (standardized  $\beta = -0.011$ ,  $t=-0.113$ ). This suggests that the hypothesis *H4: Effectuation rather than causation has a positive effect on the degree of internationalization of a start-up* was supported.

The results suggest that entrepreneurs behaving according to effectuation logic in their decision-making, anticipate to concentrate more on international business than on domestic businesses. The small and insignificant path coefficient from causality to internationalization indicated that the effect of causality on the degree of company's internationalization was negligible. This means that entrepreneurs using effectuation methods in seeking business potential rather than causal methods, and for that reason tend to have more international business than domestic. This can be explained in the same way as was done above regarding the international experience. Experienced entrepreneurs tend to use pre-commitments, experiment by building pilots, control their own operations in seeking business potential in international environment. This finding supports earlier suggestions that effectuation theory would explain the development of the internationalization process in start-up companies (Knight & Liesch, 2016). As stated earlier, in the context of internationalization, effectuation is based on relatively goal-free and unplanned approach to proceed in the development process of new opportunities, and emphasizes is on available means and partnerships, whereas causal approach is more formal and relies on planning and traditional methods. This finding allows now to answer to the third research question *"To what extent does the decision-making processes of entrepreneurs influence on the degree of internationalization of*

*start-up companies?*". Entrepreneurs having utilized effectuation logic are familiar with the procedures how to operate internationally. The results indicated that effectuation logic has a stronger effect on degree of internationalization than causation logic. Hence, *the answer to the third research question is that decision-making process based on effectuation logic has a strong positive effect on the degree of internationalization in start-up, whereas the decision-making process based on causal logic is insignificant.*

The results of the hypotheses test revealed that the path coefficient from effectuation to financial performance is insignificant (standardized  $\beta = -0.023$ ,  $t = -0.185$ ) suggesting that effectuation has no effect on company's financial performance. Hence, the hypothesis H2: *Effectuation rather than causation has a positive effect on the financial status of a start-up* was not supported.

Regarding causal logic, the path coefficient from causality to financial performance was remarkably positive and significant (standardized  $\beta = 0.228$ ,  $t = 2.151$ ) suggesting that causal logic has a significant impact on financial performance. This is a surprising finding as in the recent literature the effect of effectuation to company performance has been suggested to be strong and significant and hypothesis H2 was set accordingly (Cai et al., 2017; Kalinic et al., 2014; Smolka et al., 2016). Cai et al. (2017) studied the effect of effectuation on company's performance in Chinese software companies. Just opposite to the study in hand, they were able to show that effectuation has a positive effect on new venture performance. This finding allows now to answer to the fourth and final research question *"To what extent does the decision-making processes of entrepreneurs influence on the financial performance of start-up companies?"*. The results indicated that effectuation logic has no effect on company's financial performance, whereas causal logic has a significant impact on financial performance. Hence, *the answer to the fourth research question is that the effect of effectuation logic on the financial performance of start-up is negligible, whereas the effect of causal logic is positive and significant.* Even though the hypothesis was not supported, the result regarding the positive effect of the use of causation logic on financial performance is supporting the recent literature where the relationship of causal planning and company performance has been suggested to exist (Delmar & Shane, 2003; Kristinsson et al., 2016; Mayer-Haug, Read, Brinckmann, Dew, & Grichnik, 2013; Smolka et al., 2016).

The possible mediation effects of causation and effectuation of the effect from prior entrepreneurial experience and international experience to financial performance and degree of internationalization were not incorporated into the study because of the unreliable and unconvincing results due to the unstable measurement model because several constraints had to be added to model coefficients. This caused the model to become unstable and the results were fluctuating and nebulous. However, it turned out that all other direct paths were insignificant except the path from prior international experience to degree of internationalization. The path (standardized  $\beta = 0.263$ ,  $t = 3.161$ ) indicated that international experience had noteworthy positive and significant ( $p < 0.001$ ) effect on degree of internationalization.

The summary of the support for the hypotheses and answers to the research questions in the research are presented in TABLE 35.

TABLE 35 Summary of the support for the hypotheses and answers to research questions

	Hypothesis/Research questions	Result
H1	Prior entrepreneurial experience tends to guide entrepreneurs to use effectuation rather than causation.	Supported
H2	Effectuation rather than causation has a positive effect on the financial performance of a start-up.	Not supported
H3	Prior international experience tends to guide entrepreneurs to use effectuation logic rather than causation logic	Supported
H4	Effectuation rather than causation has a positive effect on the degree of internationalization of a start-up.	Supported
RQ1	To what extent does prior entrepreneurial experience of entrepreneurs effect on the decision-making processes in new venture creation?	Prior entrepreneurial experience has a strong positive effect on the decision - making process in new venture creation in such a way that experienced entrepreneurs tend to utilize effectual logics rather than causal logic in their decision-making.
RQ2	To what extent does prior international experience of entrepreneurs effect on the decision-making processes in new venture creation?	Prior international experience has a strong positive effect on the decision-making process in new venture creation in such a way that entrepreneurs with prior international experience tend to utilize effectual logics rather than causal logic in their decision-making.
RQ3	To what extent does the decision-making processes of entrepreneurs influence on the degree of internationalization of start-up companies?	Decision-making process based on effectuation logic has a strong positive effect on the degree of internationalization of start-up, whereas the effect of the decision-making process based on causal logic on it is insignificant.
RQ4	To what extent does the decision-making processes of entrepreneurs influence on the financial performance of start-up companies?	The effect of effectuation logic on the financial performance of start-up is negligible, whereas the effect of causal logic on it is positive and significant.

The new finding where effectuation and causation were found to be in reciprocal relationship with each other in a non-recursive model which was

developed in the end of the model tests, needs to be treated with caution. The reporting of this type of relation between effectuation and causation is rare in the literature. Quite recently, in the context of innovation and entrepreneurial orientation the reciprocal relation has been explained to happen based on causal logic into the other direction and using effectuation to the feedback direction (Verhoeff, 2011). Moreover, the use of cross-sectional data, like data of the current study, in non-redundant research models in SEM has discordant opinions in the academy (Martens & Haase, 2006; Wong & Law, 1999). Instead of cross-sectional data, longitudinal data has been favored in studies of reciprocal effects so that also the time factor is considered. The basic premise in reciprocal relation is that the effect, if it exists, is not observed at the same time as the cause. However, some researchers claim that the reciprocal effect may also happen simultaneously and the time difference between cause and effect is in practice impossible to identify (Wong & Law, 1999). If the relation of effectuation and causality were as suggested by the results of the non-recursive model of the study in hand, it would explain how the relation works in practice. For example, when an entrepreneur detects a new potential business possibility using the existing means, e.g. friends, partner network, connections, existing businesses, etc. (means oriented effectual process), and because of that, immediately may assess its' potential by conjuring the possible future state of the business (goal oriented causal process), and as a result, starts seeking potential partnerships to proceed with the new idea (effectual process). This may continue all the time. The tentative conclusion about the finding is that the finding offers a potential research proposition for further studies in a larger context than it was possible in the current study in hand.

## **7.2 Contributions to the Academy**

The current study was made more to understand, rather than to predict, the behavior of entrepreneurs in Finnish KIBS start-up companies. To the knowledge of the author, this research was one of the very first studies made in this context. Hence, this study contributes to the understanding of factors which effect on an entrepreneur in establishing a start-up company. As a main contribution, the research delivered answers to four research questions in which the effect of prior entrepreneurial experience and prior international experience on effectuation and causation, and their effects further on financial performance and degree of internationalization of the companies among Finnish KIBS start-ups was studied. Additionally, the research delivered framework to the research model for testing latent effectuation and causal factors and their antecedents and consequences using predefined measurement scales regardless of their limitations. The results included supportive results for effects of prior entrepreneurial experience and of prior international experience on causation and effectuation processes in the founding processes of the start-up companies. These results will help researchers to understand the behavior of the

entrepreneurs when establishing new ventures. This in turn will assist authorities, partners and other entrepreneurs as well to focus their own actions to correct ones in their entrepreneurship related procedures.

The results included strong support of the existence of the first effectuation dimension, describing own resources, own knowledge and networking possibilities (Dew et al., 2009). This reinforces the prior presumption that in the context of KIBS companies the emphasis is on entrepreneur's own knowledge, human capital and on existing networks. This again will help the academy in finding support for the effectuation process in new venture creation.

### **7.3 Implications for practitioners**

The results of the study will have implications for the practitioners as well. For the enterprises research results have most to offer. In the KIBS context these findings are important from the business development perspective. As stated earlier, KIBS companies are, as the acronym KIBS signifies, companies utilizing knowledge as an input for their services. Additionally, they are information and knowledge rich entities and their know-how is based on their personnel's own know-how and experience. These findings offer valuable information for the KIBS companies themselves in helping them to formulate their business models, and help them to understand better their own customers who oftentimes are other KIBS companies or other service-based companies. By knowing whether entrepreneurs of the companies have behaved effectually in the foundation phase they can understand the behavior of the other entrepreneurs better, e.g. in finding new partnerships, assessing affordable losses instead of returns, or in offering new solutions and products based on experimentation.

For the authorities, governmental organizations, funding authorities, etc., the results, will complement the knowledge in assessing the behavior of potential founders of KIBS companies and thus helps to channel the needed stimulants towards those people in the form of seed funding, growth funding, and financial counselling.

The results may encourage the universities and other teaching organizations to rethink their curriculum on entrepreneurship training urging them to concentrate more on effectual ways on new venture creation instead of traditional business planning type of ways.

### **7.4 Limitations of the study**

This study is not without limitations. Firstly, the sample size was limited due to the low response rate of respondents. This had several implications for the

study, one of them being the limitation for the number of the estimated parameters in the measurement model, because for the measurement model having a formative construct for effectuation, some constraints had to be made to achieve it identifiable model and this in turn affected to the number of free parameters in the model. Moreover, group comparisons in SEM could not be made due to the low number of the members in such groups. Further, due to this limited number of the respondents in the questionnaire, generalization of the results even within the KIBS companies might stay as an issue as only 14.2 percent of the variance in the degree of internationalization of the companies could be explained by the variance of effectuation and causation. Moreover, neither of them was able to explain the variance of financial performance statistically significantly.

Secondly, the scale for causality in the current research in hand was suffering from a weakness due to the lowish AVE value. However, this was assessed to be adequate for the study. The consequences of this drawback might be visible in some of the results, without major defects though.

Thirdly, the reliability of the measurement constructs may have been biased even though every effort was made to achieve the accepted levels for the reliability and validity indices used in creating the measurement scales. This was the case for flexibility sub-construct of effectuation. However, the scales were judged to fulfill the requirements for the current research.

Fourthly, the coding of the actions in the critical incidents was done purely by a single coder, by the author. This may have caused bias in the coding and suspicions of the validity of the coding process.

Fifthly, the number of the companies in the qualitative part was limited to ten. Hence, the weight of each of the companies in the coding process was relatively high adding the risk of misinterpretations of the results.

Sixthly and finally, because two indicators had to be specified as outcomes of the formative construct in order to get the path coefficients and the variance of error terms to be estimated for the model, the model became context specific and makes the generalization of the results difficult outside this KIBS context.

## **7.5 Proposals for future work**

During the research process several new propositions for further studies were identified. Firstly, even though the suggestion of the existence of effectuation and causation was clear and it was claimed that both logics are existing decision-making logics in the Finnish KIBS start-ups, it does not mean there would not be some other methods and logics at the same time, but this was not in the scope of the present study. To find support for the simultaneous existence of other logics together with effectuation and causal logics remained subjects for further research proposals and studies.

Secondly, the finding that effectuation grows over time in the start-up founding process is totally opposite found in literature where it is suggested

that effectuation decreases over time, and causal dimension will would be dominant in later stages. Because for this phenomenon a solid explanation was not found, this remains to be studied in the future research.

Thirdly, the measurement scales by Chandler et al. (2011) used in this study are suggested as a subject for further studies to develop them to capture more precisely the characteristics of effectuation and causation.

Fourthly, the new but nebulous finding of the non-recursive relation of effectuation and causation remained covert. The tentative conclusion about the finding is that this finding offers a potential research proposition for further studies in a larger context than it was possible in the current study in hand.

## SUMMARY

The aim of this study was to explore the effect of prior entrepreneurial and prior international experience of entrepreneur on the preferred use of either effectuation or causal logic at new venture creation, and what effect the applied logic has on company's financial performance and on the degree of internationalization. This study is characterized as a mixed methods research utilizing sequential exploratory strategy in terms of the methods used. It is one of the scarce studies done on the foundation processes in start-up creation of the Finnish knowledge intensive business services (KIBS) companies.

In the literature review some of the most relevant modern theories on entrepreneurial research were presented and discussed. Based on the literature review four research propositions were set in order to direct and steer the study, and to be verified in order to set hypotheses to be tested. For the research work, a research framework and research model were developed. The framework contained two main parts, qualitative and quantitative parts. Qualitative part included the analysis of the interviews, propositions verification, and hypotheses setting. Quantitative part included quantitative analysis and hypothesis testing. In qualitative part the analysis was based on the use of critical incident technique (CIT) in data collecting phase in the interviews of ten KIBS start-up companies. Analysis was based on coding which was completed using directed content analysis. Results of the qualitative part verified the research propositions forming the basis for the hypotheses set in the end of the qualitative part of the research. For the quantitative part new data was collected using electronic questionnaire utilizing pre-defined scales for the constructs for the latent causality and effectuation constructs. The quantitative part tested the hypotheses set in the qualitative part using statistical methods, ESEM (explorative structural equation modeling) for defining and confirming the latent factor structure followed by SEM (structural equation modeling). SEM was used for estimating the relations between effectuation and causation and their antecedents and effects defined in the research model, and for testing the fit of the research model with research data. The validity and reliability of the latent constructs were assessed. The purpose of study was to find answers to the research questions:

1. To what extent does prior entrepreneurial experience of entrepreneurs effect on the decision-making processes in new venture creation?
2. To what extent prior international experience of entrepreneurs effect on the decision-making processes in new venture creation?
3. To what extent does the decision-making processes of entrepreneurs influence on the degree of internationalization of start-up companies?
4. To what extent does the decision-making processes of entrepreneurs influence on the financial performance of start-up companies?



The results were able to confirm three of totally four hypotheses set in the research and were able to give answers to all four research questions. The findings are as follows. Firstly, the results indicate that prior entrepreneurial experience has a strong and significant positive effect on the decision-making process in new venture creation in the way that experienced entrepreneurs tend to utilize effectual logics rather than causal logic in their decision-making. This result is in line with prior research results. Secondly, prior international experience seems to have a strong positive effect on the decision-making process in new venture creation in such a way that entrepreneurs with prior international experience tend to utilize effectual logics rather than causal logic in their decision-making. This finding is in line with prior research results. Thirdly, decision-making process based on effectuation logic s to have a strong positive and significant effect on the degree of internationalization in start-up, whereas the effect of the decision-making process based of causal logic on it is insignificant. These both findings are supported by prior research. Fourthly and lastly, the effect of effectuation logic on the financial performance of start-up seems to be negligible, whereas the effect of causal logic on it seems to be positive and statistically significant. These findings are partly supported in prior research.

Causation was found to have a substantial strong positive effect on the company's financial performance, while effectuation was found to have no effect on the above-mentioned quantity.

The use of effectuation and causation logics was able to explain 14.2 per cent of the variance in the degree of internationalization of the companies. Moreover, neither of them was able to explain the variance of financial performance statistically significantly.

Finally, tentative results of the possible reciprocal relation between causation and effectuation were conditionally presented.

## YHTEENVETO (FINNISH SUMMARY)

Tutkimuksen tavoitteena oli tutkia yrittäjän aiemman yrittäjäkokemuksen ja kansainvälisen kokemuksen vaikutusta kehittämislogiikan (effectual logic) ja suunnittelulogiikan (causal logic) suosimiseen uuden yrityksen muodostamisessa, sekä mikä vaikutus tällä käytetyllä logiikalla on yrityksen taloudelliseen menestykseen ja kansainvälistymisasteeseen. Tämä tutkimus oli luonteeltaan monimenetelmätutkimus (mixed methods), jossa tutkimusmenetelmänä käytettiin peräkkäistä tutkivaa strategiaa (sequential exploratory strategy). Tämä tutkimus on yksi niistä harvoista tutkimuksista, joita on tehty suomalaisten osaamisintensiivisten yrityspalveluiden alan (knowledge intensive business services, KIBS) start-up yritysten syntyprosessista.

Kirjallisuuskatsauksessa tarkasteltiin joitakin kaikkein merkittävimmistä yrittäjyystutkimuksen nykyteorioista. Kirjallisuuskatsaukseen perustuen esitettiin neljä tutkimusväittämää, joiden tarkoituksena oli kohdistaa ja ohjata tutkimusta, ja jotka tulitisiin todentamaan, jotta voitiin laatia hypoteesit testausta varten. Tutkimusta varten kehitettiin tutkimuksen viitekehys ja tutkimusmalli. Viitekehyksessä oli kaksi pääosaa, laadullinen ja määrällinen osa.

Laadulliseen osuuteen sisältyi haastattelujen analyysi, tutkimusväittämien todentaminen sekä hypoteesien asettaminen. Tutkimuksen laadullisen osan analyysi perustui kriittisten tapahtumien (critical incident technique, CIT) käyttöön tutkimusdatan keräämisessä tutkimuksen haastatteluvaiheessa, jossa haastateltiin kymmentä suomalaista KIBS -alan start-up yritystä. Analyysi perustui sisältöjen koodaukseen, joka suoritettiin käyttäen ohjattua sisältöanalyysiä. Laadullisen osan tutkimustulokset todensivat tutkimusväittämät oikeiksi ja muodostivat perustan hypoteeseille, jotka asetettiin laadullisen osan lopussa.

Tutkimuksen määrällistä osaa varten koottiin uusi tutkimusdata sähköisellä kyselyllä, jossa hyödynnettiin ennalta määriteltyjä mittareita piileviä suunnittelu- ja kehittämislogiikan käsitteitä varten. Määrällisessä osuudessa edellä mainitut hypoteesit testattiin tilastollisesti käyttäen tutkivaa rakenneyhtälömallinnusta (explorative structural equation modeling, ESEM), jossa määriteltiin ja todennettiin faktorirakenne, jonka jälkeen suoritettiin uudelleen rakenneyhtälömallinnus (structural equation modeling, SEM).

Suunnittelu- ja kehittämislogiikoiden välisten suhteiden sekä logiikoiden taustojen ja seurausten arvioimiseen käytettiin rakenneyhtälömallinnusta hyödyntäen tutkimuksessa siihen kehitettyä mittausmallia, jota käytettiin myös testaamaan mittausmallin ja tutkimusdatan yhteensopivuutta. Käsitteiden oikeellisuus ja luotettavuus arvioitiin. Tutkimuksen tarkoituksena oli löytää vastaukset seuraaviin tutkimuskysymyksiin:

1. Missä määrin yrittäjän aiempi yrittäjäkokemus vaikuttaa päätöksentekoprosessiin, joka liittyy yrityksen perustamiseen?
2. Missä määrin yrittäjän aiempi kansainvälinen kokemus vaikuttaa päätöksentekoprosessiin, joka liittyy yrityksen perustamiseen?

3. Missä määrin yrittäjän päätöksentekoprosessi vaikuttaa start-up yrityksen kansainvälistymiseen?
4. Missä määrin yrittäjän päätöksentekoprosessi vaikuttaa start-up yrityksen taloudelliseen menestykseen?

Tutkimuksen tulokset tukivat kolmea hypoteesiä neljästä ja antoivat vastaukset kaikkiin tutkimuskysymyksiin. Tutkimustulokset ovat seuraavat. Ensiksi, tulokset viittaavat siihen, että yrittäjän aiemmalla yrittäjäkokemuksella on vahva positiivinen ja tilastollisesti merkitsevä vaikutus uuden yrityksen perustamisen päätöksentekoprosessiin siten, että kokeneet yrittäjät pyrkivät hyödyntämään kehittämislogiikkaa suunnittelulogiikan sijaan. Tulos on linjassa aiempien tutkimustulosten kanssa.

Toiseksi, yrittäjän aiemmalla kansainvälisellä kokemuksella näyttäisi olevan vahva positiivinen ja tilastollisesti merkitsevä vaikutus uuden yrityksen muodostamisen päätöksentekoprosessiin siten, että kansainvälistä kokemusta omaava yrittäjä pyrkii hyödyntämään kehittämislogiikkaa suunnittelulogiikan sijaan. Tulos on linjassa aiempien tutkimustulosten kanssa.

Kolmanneksi, kehittämislogiikkaan perustuvalla päätöksentekoprosessilla näyttäisi olevan vahva positiivinen ja tilastollisesti merkitsevä vaikutus start-up yrityksen kansainvälistymisasteeseen, kun taas suunnittelulogiikkaan perustuvalla päätöksentekoprosessilla vaikutus näyttäisi olevan tilastollisesti ei-merkitsevä. Aiemmat tutkimustulokset tukevat näitä molempia tuloksia.

Neljänneksi ja viimeiseksi, kehittämislogiikan vaikutus yrityksen taloudelliseen menestykseen näyttäisi olevan tilastollisesti ei-merkitsevä, kun taas suunnittelulogiikan vaikutus näyttäisi olevan positiivinen ja tilastollisesti merkitsevä. Aiemmat tutkimustulokset tukevat osaksi näitä tuloksia.

Suunnittelulogiikalla todettiin olevan vahva positiivinen ja merkittävä vaikutus yrityksen taloudelliseen menestykseen, mutta kehittämislogiikalla siihen todettiin olevan tilastollisesti ei-merkitsevä vaikutus.

Kehittämislogiikan ja suunnittelulogiikan käyttäminen selittivät 14.2 prosenttia yritysten kansainvälistymisasteen vaihtelusta. Kumpikaan niistä ei kuitenkaan pystynyt tilastollisesti merkitsevällä tavalla selittämään yrityksen taloudellista menestystä. Lopuksi esitettiin alustavat ehdolliset tulokset kehittämislogiikan ja suunnittelulogiikan mahdollisista keskinäisistä riippuvuussuhteista.

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**APPENDIX 1**

KIBS classes used in the research based on NACE classes

KIBS classification	NACE class
Technology based KIBS	
Information systems	72 (excluding 725)
Technical services	742, 743, 74871
Business services	
Research & development	73
Legal and economical services	7411, 7412, 74372
Marketing and advertising services	7413,744, 74873
Consultancy and HR-services	7414,745