



Norwegian University of  
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# Team Maturity, Innovation Capability and Firm Performance in Norwegian Entrepreneurships: Is There a Connection?

Presenting a comprehensive study examining how the team maturity of entrepreneurial teams and their innovation capability are linked to firm performance.

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## Preface

This Master's thesis is conducted at the Institute of Industrial Economics and Technology Management at the Norwegian University of Science and Technology (NTNU). It was performed in the spring of 2017. The thesis is part of a specialization in Strategy and International Business Development. Moreover, the thesis is also a contribution to the extensive research program Operational Leadership at NTNU. The core of the Master's thesis is the study of innovative teams in entrepreneurialships.

In specific, this Master's thesis aspires to examine the relationship between team maturity, innovation capability and firm performance in Norwegian entrepreneurial teams. In order to do this, a study was performed using data collected from a selection of Norwegian entrepreneurialships. Constructs are developed to measure innovation capability and firm performance, as there is little consensus on how to measure these concepts in current literature.

Moreover, this Master's thesis has been an excellent test in research ethics. As I am sure many researchers have encountered in their work, empirics does not always act the way theory would expect it to. It is incredibly frustrating when the results you are so sure *must* occur, glimmer with their absence in your data set. However, is it not the unexpected results that might hold the most interesting research? It might be frustrating to challenge our logical models of relationships and effects between variables, yet it can facilitate the discovery of entirely new insight and knowledge.

Furthermore, the study's sample population vary from highly successful, internationally operating born globals to modest, small startups that have barely begun their journey from the planning board. Thus, the findings in this study should arguably be applicable in a general term, hopefully contributing with results that may come to be useful for all teams that strive to be innovative, in the way that most entrepreneurialships do.

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Maria Camilla Nørgaard



## Acknowledgements

Throughout the work on this Master's thesis, many have offered invaluable assistance and participation, without which this study could not have come to be.

First of all, my gratitude is extended towards all the entrepreneurs that participated in this study and made the data collection possible. An especial thank you is directed to the entrepreneurship that was available for further thorough data collection and in depth-interviews for a detailed case study.

Furthermore, I wish to extend my sincerest appreciation to NTNU Accel, BI Startup, Startuplab, Oslo Tech, School of Entrepreneurship NTNU, Oslo Business Region and StartupMatcher for their aid in identifying relevant entrepreneurs for this study.

The research project Operational Leadership has been very kind in sharing some of their project's team maturity data, for which I am very grateful as it allowed for a longitudinal aspect in my study. Allowing me insight in the specific SPGR analysis algorithm was also part of enabling me to do a comprehensive analysis of the current status on team maturity in the entrepreneurs, of which this study depended.

Moreover, in the development of the methodology of the data collection, NTNU Ph.D. Candidate Joseph Samuel Schultz offered an insight in his experience with innovation strategy and innovation management research, which helped sorting several questions on the matter. Thank you. All other interviewees and conversation partners on the matter, formal and informal, are also thanked duly.

Finally, I would like to thank my supervisor, Endre Sjøvold, for his assistance and support throughout the process of developing and producing this Master's thesis. As Van Doren (2014) so eloquently put it: "The art of teaching is the art of assisting discovery."



## Abstract

The necessity of innovative entrepreneurship for sustained economic growth is increasing (IMF, 2017). This is the fundamental motivation for this thesis, in which a study on team maturity, innovation capability, and firm performance in Norwegian entrepreneurships has been performed. Two research questions have guided the study: RQ 1: Is there an effect on firm performance from team maturity and innovation capability in entrepreneurships? And RQ 2: Is there an effect from University Master's programs in entrepreneurship on team maturity, innovation capability and/or firm performance in entrepreneurships? Data was obtained on the team maturity, innovation capability, and firm performance of 61 entrepreneurships, which has been analyzed using multiple methods. The study has contributed with new insight in this area, as well as identifying several interesting elements for further research.

In sum, it was found that high team maturity in entrepreneurial teams leads to high innovation capability for the entrepreneurship. There was found a more varied degree of support for that high innovation capability leads to high firm performance in entrepreneurships, and that high team maturity leads to high firm performance moderated by innovation capability in entrepreneurships. A positive relationship was found via some methods, however the findings were not consistent across other methods. Further investigation of these relationships in other studies is therefore recommended before any final conclusions can be drawn. Especially, the understanding of firm performance in entrepreneurships should be studied further.

As for RQ2, this study has consistently not found any positive effect on team maturity, innovation capability, or firm performance from the affiliation to a University Master's program for entrepreneurship. It was also found that the entrepreneurships with an affiliation to a University Master's program for entrepreneurship were less inclined to use the team as an arena for innovation than the entrepreneurships without such an affiliation. It is recommended that further research look into these relationships to strengthen the understanding of the causes for these findings.





## Sammendrag

Behovet for innovativt entreprenørskap for å opprettholde økonomisk vekst øker (IMF, 2017). Dette er den grunnleggende motivasjonen for denne masteroppgaven, hvor det har blitt utført en studie på modenhetsgrad i team, innovasjonsevne, og selskapets yteevne i norske entreprenørskapsbedrifter. To forskningsspørsmål har ledet studien: RQ1: Er det en effekt på selskapets yteevne fra modenhetsgraden i team og innovasjonsevnen i entreprenørskapsbedrifter? Og RQ2: Er det en effekt fra et masterprogram for entreprenørskap ved universitetet på modenhetsgrad i team, innovasjonsevne, og selskapets yteevne for entreprenørskapsbedrifter? Data på modenhetsgraden i team, innovasjonsevnen, og yteevnen til 61 entreprenørskapsbedrifter har blitt samlet inn og analysert via flere metoder. Studien har bidratt med ny innsikt på disse emnene, så vel som å avdekke flere interessante temaer for videre forskning.

I sum har det blitt funnet at en høy modenhetsgrad i team leder til høy innovasjonsevne i entreprenørskapsbedrifter. Funnene varierte noe mer med tanke på om høy innovasjonsevne leder til høy yteevne i selskapet, og om høy modenhetsgrad i team leder til høy yteevne i selskapet moderert av innovasjonsevne. Positive forhold for dette ble funnet via noen metoder, men ikke konsistent ved andre metoder. Videre forskning på disse emnene er derfor anbefalt før noen endelige konklusjoner kan trekkes. Å forstå yteevne i entreprenørskapsbedrifter bør være spesielt i fokus.

Når det gjelder RQ2, så har studien ikke funnet noe støtte for at tilhørighet ved et masterprogram for entreprenørskap øker hverken modenhetsgrad i team, innovasjonsevne, eller selskapets yteevne for entreprenørskapsbedrifter. Videre ble det også funnet at entreprenørskapsbedriftene med en slik tilhørighet benyttet team som en arena for innovasjon i mindre grad enn entreprenørskapsbedriftene som ikke hadde en slik tilhørighet. Det anbefales at videre forskning ser nærmere på disse forholdene for å styrke forståelsen av dem.



# Table of Contents

Preface.....	i
Acknowledgements.....	iii
Abstract .....	v
Sammendrag .....	vii
1. Introduction.....	1
1.1 Hypotheses .....	2
1.1.1 Hypotheses for RQ 1.....	2
1.1.2 Hypotheses for RQ2 .....	5
2. Theoretical Framework .....	7
2.1 Team Maturity in Entrepreneurial Teams.....	7
2.1.1 Definition of Team Maturity .....	7
2.1.2 About SPGR as a Method .....	7
2.1.3 Spin-Theory and Team Maturity: The Four Basic Group Functions.....	8
2.1.4 Spin-Theory and Team Maturity: The (C-N) and (O-D)-Dimensions.....	9
2.1.5 Spin-Theory and Team Maturity: The (W-S)- dimension .....	9
2.1.6 Spin-theory and Team Maturity: Four Levels of Team Maturity .....	10
2.1.7 The Entrepreneurial Team .....	13
2.2 Innovation Capability .....	14
2.2.1 Definition of Innovation Capability .....	14
2.2.2 Definition and Sources of Innovation.....	17
2.2.3 Innovation Dimensions.....	20
2.2.4 Strategic Resource Based View: Competence and Technology.....	20
2.2.5 Strategic Resource Based View: Human Capital .....	21
2.2.6 Management and Internal Processes.....	22
2.2.7 Innovation and Teamwork .....	23
2.2.8 University Program Influence on Innovation Capability .....	24
2.3 Firm Performance.....	25
2.3.1 Definition of Firm Performance .....	25
2.3.2 A Construct for Measuring Firm performance .....	27

2.3.3 Liquidity .....	28
2.3.4 Profitability .....	28
2.3.5 Solidity .....	28
2.3.6 Sales Growth .....	29
3.3.7 University program influence on Firm Performance .....	29
3. Methodology .....	30
3.1 Methodological Fit .....	32
3.2 Literature Review .....	33
3.2.1 Team Maturity.....	33
3.2.2 Innovation Capability .....	33
3.2.3 Firm Performance.....	34
3.3 Qualitative Analysis .....	34
3.3.1 Semi-structured Interviews .....	34
3.3.2 Unstructured Interviews .....	35
3.3.3 Additional Input from Entrepreneurships.....	36
3.4 Quantitative Analysis.....	36
3.4.1 Survey Development .....	36
3.4.2 Survey Diffusion and Response Rate.....	37
3.5 Primary and Secondary Data Sources .....	38
3.6 Reliability .....	38
3.6.1 Reliability of Quantitative Methods .....	38
3.6.2 Reliability of Qualitative Methods .....	39
3.7 Validity.....	39
3.7.1 Internal Validity .....	40
3.7.2 External Validity .....	40
3.7.3 Criterion Validity.....	40
3.7.4 Construct Validity .....	40
3.7.5 Content Validity.....	41
3.8 How to assess Team Maturity using SPGR Data .....	41
3.8.1 The SPGR-Method .....	42
3.8.2 Method for Evaluating Team Maturity from SPGR-Data .....	43
3.9 How to Assess Innovation Capability in Entrepreneurships .....	45

3.10 How to assess Firm Performance of Entrepreneurships.....	47
4. Empirical findings .....	49
4.1 Affiliation to UEM and Area of Operation.....	49
4.2 Team Maturity Results .....	51
4.3 Innovation Capability Results.....	54
4.3.1 Innovation Capability .....	54
4.3.2 Innovation and Teamwork .....	57
4.4 Firm Performance Results .....	60
4.5 Is There a Connection? The relationship between team maturity, innovation capability, and firm performance .....	63
4.5.1 Correlation analysis .....	64
4.5.2 Cluster Analysis .....	65
4.5.3 Correlation Analysis between Elements of Team Maturity, Innovation Capability, and Firm Performance.....	69
4.6 Case Study .....	71
4.6.1 About the Case Study Entrepreneurship.....	71
4.6.2 Case Study Team Maturity .....	72
4.6.3 Case Study Innovation Capability .....	73
4.6.4 Case Study Firm Performance .....	74
4.6.5 Case Study Interviews .....	74
5. Discussion .....	76
5.1 Team Maturity.....	76
5.1.1 Team Maturity Levels: Team Spirit .....	77
5.1.2 Team Maturity Levels: Production .....	78
5.1.3 University Program Influence on Team Maturity .....	79
5.1.4 University Program Influence: Longitudinal Analysis of Group 1 .....	79
5.2 Innovation Capability .....	80
5.2.1 Innovation Capability Levels.....	80
5.2.2 Innovation Dimensions.....	81
5.2.3 Strategic Resource Based View: Competence and Technology .....	82
5.2.4 Strategic Resource Based View: Human Capital .....	82
5.2.5 Management and Internal Processes.....	83

5.2.6 Innovation and Teamwork .....	84
5.2.7 University Program Influence on Innovation Capability .....	85
5.3 Firm Performance.....	86
5.2.1 Overall Firm Performance Levels .....	87
5.2.2 Liquidity.....	88
5.2.3 Profitability.....	88
5.2.4 Solidity.....	89
5.2.5 Sales Growth .....	90
5.2.6 University Program Influence on Firm Performance .....	90
5.4 Is there a Connection? The relationship between team maturity, innovation capability, and firm performance .....	91
5.4.1 Correlation Analysis with a Mini-Case Study .....	91
5.4.2 Cluster Analysis .....	93
5.4.3 Correlation Analysis between Elements of Team Maturity, Innovation Capability, and Firm Performance.....	96
5.3.4 Correlations between Team Maturity and Solidity and Sales Growth .....	97
5.3.5 Correlations between Teamwork for Innovation and InnoCompStrat and InnoLeadProc.....	99
5.5 Case Study .....	102
5.5.1 Case Study Team Maturity .....	102
5.5.2 Case Study Innovation Capability.....	103
5.5.3 Case Study Firm Performance .....	105
5.5.4 Case Study support for RQ1 and RQ2 .....	106
6. Conclusion .....	108
6.1 Limitations of the Study .....	109
6.2 Implications and Further Research .....	110
Bibliography.....	111

## List of Figures

Figure 1: Hypothesis 1 .....	2
Figure 2: Hypothesis 2 .....	3
Figure 3 - Hypothesis 3 .....	3
Figure 4 - Hypotheses for RQ1 .....	4
Figure 5 - Hypothesis 4 .....	5
Figure 6 - Hypothesis 5 .....	5
Figure 7 - Hypothesis 6 .....	6
Figure 8 - Hypotheses linked to RQ2 .....	6
Figure 9: Balance of Basic Group Functions (Sjøvold, 2007) .....	8
Figure 10 - Types of Innovation .....	20
Figure 11 - Visualization of Innovation Capability .....	24
Figure 12: Illustration of the Iterative and Recursive Work Process .....	30
Figure 13 - Teamwork for Innovation .....	58
Figure 14 - Team maturity - Solidity/Sales Growth Correlations .....	98
Figure 15 - Correlations between Teamwork for Innovation and InnoCompStrat/InnoLeadProc .....	99
Figure 16 - Correlations between Teamwork for Innovation and Elements of InnoCompStrat .....	100
Figure 17 - Correlations between Teamwork for Innovation and Elements of InnoLeadProc .....	101

## List of Tables

Table 1 - Team Maturity Levels' Ability to handle Certain Context and Task Complexity .....	12
Table 2: Innovation Capability .....	15
Table 3 - Theoretical Perspectives on Innovation Capability .....	17
Table 4 - Sources to Innovation .....	18
Table 5: Firm Performance Indicators .....	26
Table 6 - Final Answer Percentages Per Data Subgroup .....	37
Table 7 - SPGR Tool for Measuring Team Dynamics .....	42
Table 8 - SPGR 12 Team Dynamics Vectors .....	43
Table 9- Team Maturity Levels .....	44
Table 10 - Analysis Method for Team Maturity Assessment: Balance .....	44
Table 11 - Analysis Method for Team Maturity Assessment: Withdrawal versus Synergy .....	45
Table 12 - Innovation Capability Construct .....	46
Table 13 - Innovation Capability Levels .....	46

Table 14 - Firm Performance Construct .....	48
Table 15 - Firm Performance Levels .....	48
Table 16 - Financial Ratio Assessment Convergence Table: Liquidity.....	48
Table 17 - Financial Ratio Assessment Convergence Table: Profitability, Solidity, Sales Growth .....	49
Table 18 - Number of Respondents per Data Subgroup .....	50
Table 19 - Distribution of Area of Operation .....	50
Table 20 - Cross table: Area of Operation versus Group Membership.....	50
Table 21 - Team Maturity Levels M.....	52
Table 22 – Frequencies of Team Maturity Levels .....	53
Table 23 - Average Group Team Maturity.....	53
Table 24 - Changes in Team Maturity over Time (Group 1).....	53
Table 25 - Innovation Variable Means .....	54
Table 26 – Correlations for Innovation Variables .....	54
Table 27 - Innovation Capability.....	55
Table 28 - Innovation Capability Level Frequencies.....	57
Table 29 - Mean of Innovation Capability, Groups 1-3 .....	57
Table 30 - Use of Team as Arena for Work on Innovation.....	58
Table 31 - Correlations of InnoTeam and the Other Innovation Variables.....	59
Table 32 - Detailed Analysis of InnoTeam's effect on team maturity, innovation capability, and firm performance .....	59
Table 33 - Financial Ratio Assessment Means .....	60
Table 34 – Correlations for Financial Ratios.....	60
Table 35 - Firm Performance.....	61
Table 36 - Frequencies of Firm Performance Levels .....	63
Table 37 - Firm Performance Mean Values.....	63
Table 38 - Summarized results for team maturity, innovation capability, and firm performance .....	64
Table 39 - Correlation Analysis for Team Maturity, Innovation Capability, and Firm Performance.....	65
Table 40 - Cluster Analysis and ANOVA Results .....	67
Table 41 - Detailed Correlation Analysis .....	69
Table 42 - Correlation Analysis of Elements in InnoCompStrat and InnoLeadProc with Teamwork for Innovation.....	70
Table 43 - Explanation of Topics Represented by Code Q .....	71
Table 44 - Case Study Entrepreneurship SPGR Data 12 vectors .....	72
Table 45 – Case Study Team Maturity .....	73
Table 46 - Case Study Innovation Capability .....	73
Table 47 - Case Study Firm Performance .....	74
Table 48 - Results from Mean Analysis .....	91
Table 49 - Results of Correlation Analysis .....	93



Table 50 – Summarized Findings from Cluster Analysis.....	95
Table 51 - Results of Cluster Analysis .....	96
Table 52 - Detailed Correlation Analysis .....	97
Table 53 - Results of Detailed Correlation Analysis .....	102
Table 54 - Case Study Results .....	107

## List of Appendices

Appendix 1: Interview Guide, Case Study Entrepreneurship.....	I
Appendix 2: Survey Questions: Team Maturity, Innovation Capability, and Firm Performance .....	II
Appendix 3: SPGR Data Table - Raw Data and Spin-Theory Vector Data.....	XI
Appendix 4: SPGR Data Table - Longitudinal and Current Processed Data 12 Vectors .....	XV
Appendix 5: N-C, O-D and W-S Dimensions Team Maturity Analysis .....	XXVII
Appendix 6: ICT Tools Applied in Study.....	XXXII
Appendix 7: List of Interviews .....	XXXIII
Appendix 8: Firm Performance Raw Data .....	XXXV
Appendix 9: Innovation Capability Raw Data .....	XL
Appendix 10: Detailed Correlation Table .....	XLIII

# 1. Introduction

In the years to come, innovation will be an essential requirement for creating and sustaining economic growth (IMF, 2017). Moreover, environmental concerns and technological development are two examples of several game-changers that are currently challenging traditional industries. The importance of innovative entrepreneurship as an answer to this development is therefore increasing (Audretch, 2012; Crumpton, 2012). This is the fundamental motivation for this thesis.

Accordingly, the thesis has attempted to discern the relationship between team maturity, innovation capability, and firm performance in entrepreneurships. To put it concretely in a research question:

*RQ 1: Is there an effect on firm performance from team maturity and innovation capability in entrepreneurships?*

For this purpose, a study has been conducted, where these properties have been analyzed in 61 Norwegian entrepreneurships. An extra dimension has been added in including data from both entrepreneurships that are issued from a University Entrepreneurship Master's program, and entrepreneurships without any affiliation to such University Entrepreneurship programs. Thereby, a second research question can be added:

*RQ 2: Is there an effect from University Master's programs in entrepreneurship on team maturity, innovation capability and/or firm performance in entrepreneurships?*

The way of combining these three elements in specific, team maturity, innovation capability, and firm performance, in a study seems quite unique as the author has not come across any such studies in the literature review or former reading.

Although there is a vast scientific field on team theory, hereunder team dynamics (Levi, 2001; McGrath, Arrow, & Berdahl, 2000), team maturity is relatively rare as a concept in current literature (Boughzala & De Vreede, 2015). The term was introduced in 1993 in literature (Elrod & Tippett, 1999), and one would expect more literature to have accumulated on this topic during the past 24 years.

Moreover, several authors have pointed out the research gap on entrepreneurial teams in specific (Cooney, 2005; Forbes, Borchert, Zellmer-Bruhn, & Sapienza, 2006; Vanaelst et al., 2006). Furthermore, innovation theory is an up-and-coming theoretical field, attracting great interest over the last few decades (Fagerberg, 2006b), however there is not yet very much research on innovation capability in specific (Iddris, 2016).

Firm performance, however, is a well-established scientific field when approaching it from the angle of financial ratios (Natarjan Venkatraman & Ramanujam, 1986). Nevertheless, the number of studies on firm performance for entrepreneurships in specific is scarce (Lechner &

Gudmundsson, 2014), and the constellation with firm performance in combination with team or innovation theory is even more scarce (Atalay, Anafarta, & Sarvan, 2013).

Thus, theoretical understanding as of today is limited on the specific field that this study covers. This study contributes to literature with further insight in each of the three domains of team, innovation, and firm performance theory specifically concerning entrepreneurs. Furthermore, a contribution is made in understanding the link between these three domains better, in specific for team maturity, innovation capability and firm performance.

As the hypotheses below (ch. 1.1 Hypotheses) describe, it is expected to find a positive relationship between team maturity, innovation capability, and firm performance. This is based on connecting the moderate amount of literature that is found to apply to the specific conditions set in this study. More specifically, a high team maturity is expected to facilitate high innovation capability, which again is expected to lead to high firm performance in entrepreneurs. Below, this is explained in further detail and visually represented in figures.

## 1.1 Hypotheses

### 1.1.1 Hypotheses for RQ 1

The hypotheses that were initially developed, linked to the research question RQ1 for this study are as follows (H1, H2, and H3):

*H1: High team maturity leads to high innovation capability for entrepreneurs.*

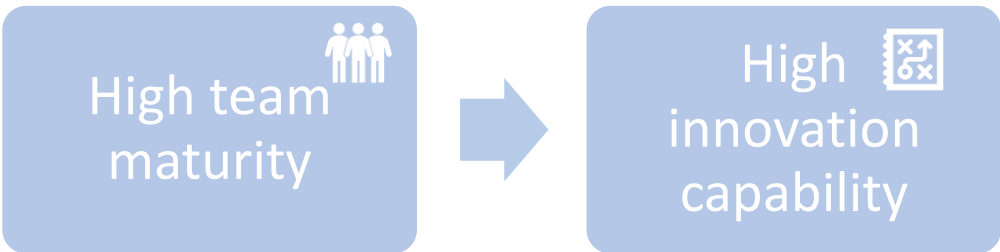


Figure 1: Hypothesis 1

Hypothesis 1 state that high team maturity will lead to high innovation capability for entrepreneurs. It is assumed that the relationship between team maturity and innovation capability is positively correlated, meaning also that a low team maturity will lead to a low innovation capability. The theory supporting this hypothesis is based on that it has been found that innovation capability is heavily dependent on teamwork and the team dynamics of the

team (Dackert, Lööv, & Mårtensson, 2004; West & Anderson, 1996). Furthermore, we assume that team maturity as it is defined in Spin theory by (Sjøvold, 2006a, 2007, 2014) and measured by the SPGR-method is a suitable measure of the entrepreneurial team's team dynamics.

*H2: High innovation capability leads to high firm performance for entrepreneurships.*

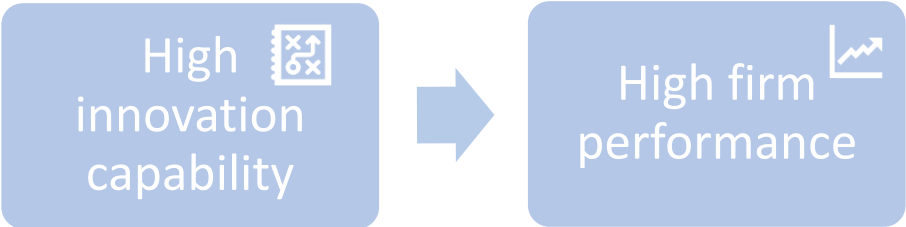


Figure 2: Hypothesis 2

Based on the literature review performed for this thesis, we hypothesize that innovation capability has a positive correlated relationship with firm performance. This is based on findings that state that innovation is entirely necessary for economic success for entrepreneurships (Brouwer, 1991; Castellacci, Grodal, Mendonca, & Wibe, 2005; Galindo & Méndez-Picazo, 2013; Galindo & Méndez, 2014). The roots of which we can trace all the way back to the early texts of Schumpeter, linking entrepreneurship with innovation and economic growth (Audretsch, 2012; Fagerberg & Verspagen, 2009).

*H3: Team maturity has a mediating effect on firm performance, moderated via its effect on the entrepreneurship's innovation capability.*

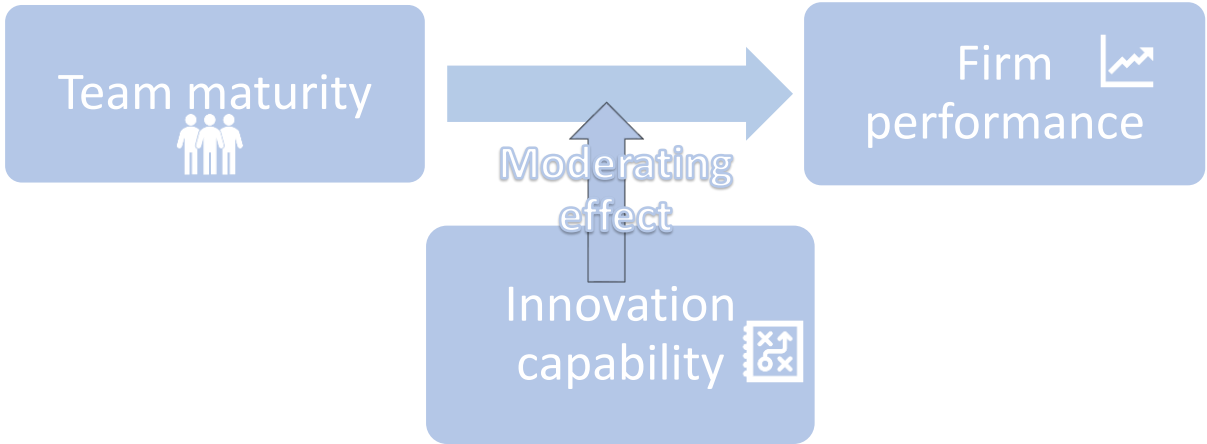


Figure 3 - Hypothesis 3

In addition to having a direct, positive relationship with innovation capability, it is hypothesized that team maturity also has a direct, positive relationship with firm performance. It is thought that by allowing for highly demanding, innovative teamwork, higher team maturity will lead to better firm performance for the entrepreneurship. As the correct team maturity according to the task and context of the team helps the entrepreneurial team perform better (Sjøvold, 2006a, 2007, 2014), it is hypothesized that it will also increase the firm performance of the entrepreneurship. The conditional supposition for this is that the entrepreneurship’s firm performance depends on the entrepreneurial team’s team performance.

This effect is assumed to be moderated by innovation capability, as innovation capability is both hypothesized to be affected by team maturity (H1) and to be a driver for firm performance in a positively correlated manner (H2). As applied in this thesis, moderated relationships are when a variable affects the intensity of the relationship between two other variables (Baron & Kenny, 1986; Bryman, 2012). Thus, we hypothesize that innovation capability will moderate the effect of team maturity on firm performance. Note that innovation capability is hypothesized to affect firm performance both directly (H2) by mediating and indirectly (H3) by moderating the positive effect of team maturity on firm performance. A mediating effect is when a variable can affect what kind of relationship there is between two other variables (Baron & Kenny, 1986).

Figure 4 below summarizes the hypotheses linked to RQ1.

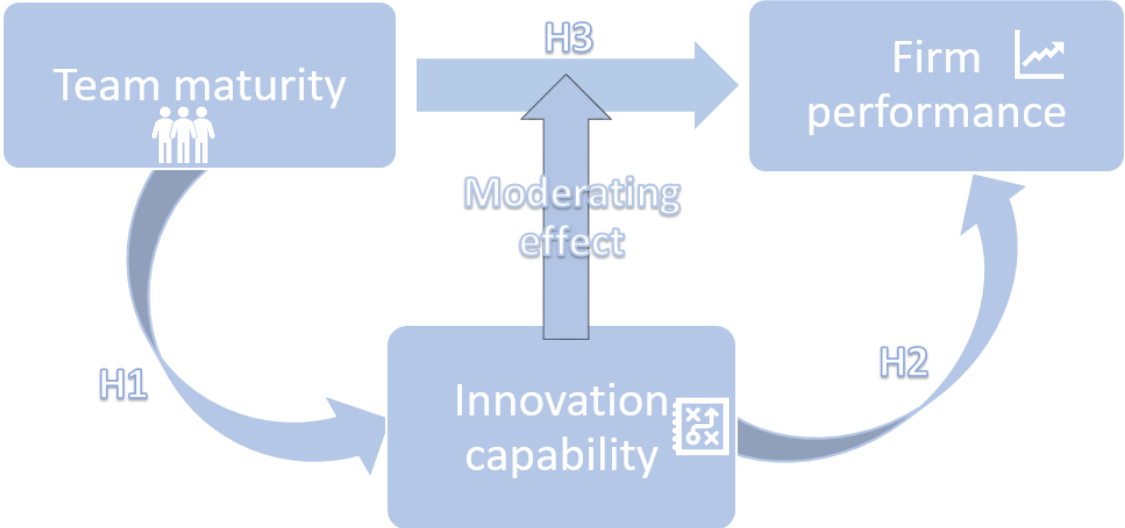


Figure 4 - Hypotheses for RQ1

### 1.1.2 Hypotheses for RQ2

Three hypotheses (H4, H5, H6) associated with research question 2 are developed as explained below. The sample population is divided in entrepreneurship affiliations with a University Entrepreneurship Master's program (Gr. 1 and 2), and not affiliated with a University Entrepreneurship Master's program (Gr. 3), which will allow for studying whether these hypotheses hold empirically.

*H4: An affiliation to a University Entrepreneurship Master's program (UEM) leads the entrepreneurship to have a higher team maturity (TM).*

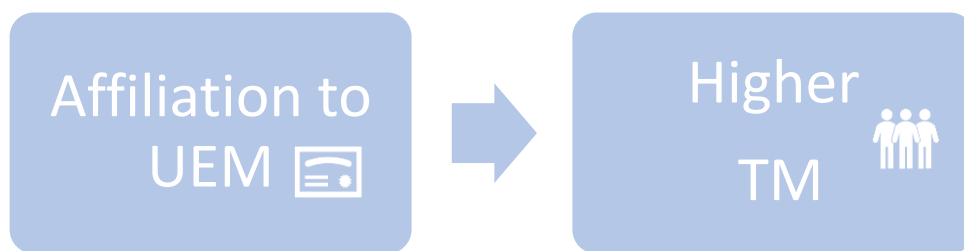


Figure 5 - Hypothesis 4

H4 is based on that a University Entrepreneurship Master's program (UEM) offers practical teambuilding for the entrepreneurial team, which has been found to be a means to consolidate and increase team maturity (Sjøvold, 2006a, 2007, 2014).

*H5: An affiliation to a University Entrepreneurship Master's program (UEM) leads the entrepreneurship to have a higher innovation capability (IC).*

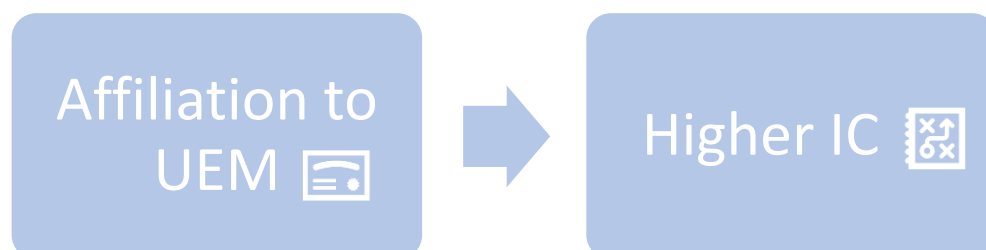


Figure 6 - Hypothesis 5

H5 is based on literature that has found a positive effect on teams from being affiliated to university programs and similar networks on innovation capability (Castellacci et al., 2005; Guo & Zhou, 2016; Samson & Gloet, 2013)

*H6: An affiliation to a University Entrepreneurship Master's program (UEM) leads the entrepreneurship to have a higher firm performance (FP).*

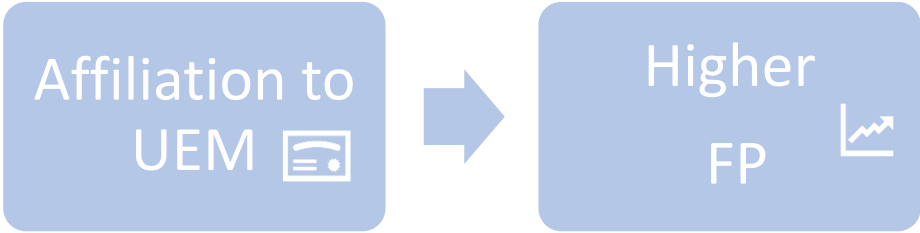


Figure 7 - Hypothesis 6

H6 is based on literature that has found a positive effect on teams from being affiliated to university programs and similar networks and firm performance (Lechner & Leyronas, 2009; Stam & Elfring, 2008).

Figure 8 below summarizes the hypotheses linked to RQ 2.

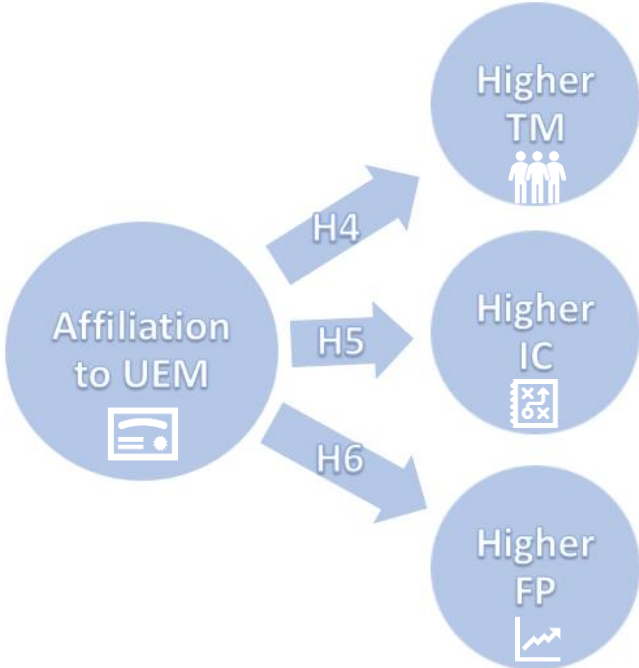


Figure 8 - Hypotheses linked to RQ2

## 2. Theoretical Framework

The theoretical framework presents the most important theory that the methodology and discussion of this study are based on. First, we shall elaborate on team maturity, then innovation capability and finally, startup firm performance. These three scientific fields all have in common that they are complex and to a certain degree lack a concrete definition that is widely agreed upon as the unique way of defining the concept. Often, the definition will depend on several circumstantial elements. As the focus of this study is entrepreneurial teams, the applied theory is selected specially to fit this purpose. This is especially evident when it comes to innovation capability and firm performance, as shall be explained in the subchapters of these topics.

### 2.1 Team Maturity in Entrepreneurial Teams



For assessing the entrepreneurial team's team dynamics, hereunder team maturity, this study applies the methodology of Systemizing the Person-Group Relation (SPGR). Hence, the following explains the theoretical backdrop that the SPGR methodology is based upon. Theoretical chapter 2.2 is also based upon the pre-diploma thesis "Team Dynamics And Entrepreneurship – Which teams manage to keep the boat afloat?" by Noergaard (2016).

#### 2.1.1 Definition of Team Maturity

Team Maturity, based on Spin-theory by Sjøvold (2006a, 2007, 2014), is defined as the following as used in this paper:

*Team maturity defines how well the team is equipped to handle certain levels of complexity of task and unpredictability of context, which is regulated through the team dynamics of the team.*

In the following subchapter 2.1, the basis for assessing team maturity is presented.

#### 2.1.2 About SPGR as a Method

The SPGR framework is a methodological tool, developed as a practical approach to research and human relations consulting in an organizational context (Sjøvold, 2007). It is built upon Spin-theory. Spin-theory has been developed since the 1980s, developed from a robust



selection of influential theories related to team literature. The most influential works include Bales (1985, 1999) on social interaction systems, Bion (1961) on group emotionality, Parsons, Bales and Shils (1953) on group functions, and finally, Mills (1984) on group development (Sjøvold, 2007).

Furthermore, the SPGR model itself is influenced by the SYMLOG model by Bales and Cohen (1979). The SYMLOG is in full called the System for Multiple Level Observation of Groups, and has been applied extensively in studies all over the world. The SPGR framework is therefore based on years of observations of groups and empirical data. The observation data for SPGR is based on Bales' 12 category IPA system and later on the SPGR 12 category observation system, much like the SYMLOG model. SPGR is developed to be a tool for understanding the team at a given time, and also understanding the team's development over time (Sjøvold, 2007).

### 2.1.3 Spin-Theory and Team Maturity: The Four Basic Group Functions

In the very basis of Spin-theory are the four basic group functions control, nurture, opposition and dependence (Sjøvold, 2007), as portrayed in Figure 9. The team dynamics of the team is expressed through the balance of and the rate of interchangeability between the basic group functions. No single group function can ensure a sound and effective team dynamic (Sjøvold, 2014). Therefore, all four team functions should be addressed and evaluated, in order to fully understand the team dynamic.

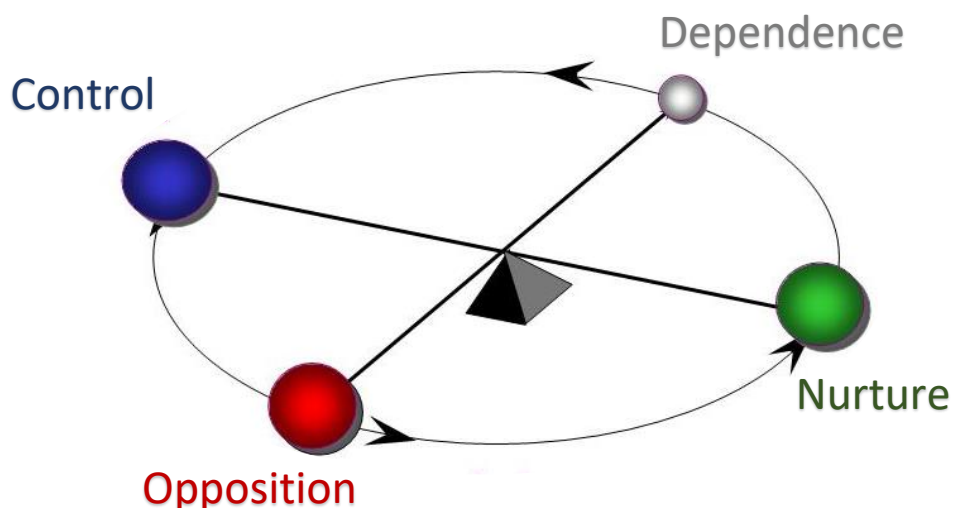


Figure 9: Balance of Basic Group Functions (Sjøvold, 2007)

Control denotes the structural setting within the group, which enforces structure, authority and procedures (Sjøvold, 2007). The control function supports accepted and established

procedures. Someone taking a role of control focuses on rigid structure and following the “right” way to proceed (Sjøvold, 2014).

Nurture on the other hand, is driven by people-oriented behavior such as caretaking behavior, demonstrating acceptance of differences and encourage willingness to listen to deviant opinions (Sjøvold, 2007). Nurture is thus about establishing and maintaining social relations within the group. Someone that takes on a nurturing role in the team typically shows openness and friendliness, and exhibits informal and democratic behavior (Sjøvold, 2014).

Opposition denotes the team members’ ability to critically question and challenge procedures and results (Sjøvold, 2007). Established truths and “obvious” solutions are not blindly accepted, but put under scrutiny and questioned. The opposition role typically shows itself as intolerance for control, authority and structure, and the refusal to comply (Sjøvold, 2014).

Dependence denotes the team members’ ability to support and adhere to procedures and results, sometimes despite not thinking they are optimal or even correct (Sjøvold, 2007). Dependence promotes loyalty and facilitates collaboration. The dependence role typically embodies a preference to commitment and discipline. Also, the role often implies focusing on problem solving and the task at hand, though lacking critical and independent thinking (Sjøvold, 2014).

#### *2.1.4 Spin-Theory and Team Maturity: The (C-N) and (O-D)-Dimensions*

As portrayed by Figure 9, the four basic group functions are balanced out in the form of two dimensions, namely the control-nurture (C-N) and opposition-dependence (O-D)-dimensions. Let’s explain in detail what these two dimensions represent:

The Spin-theory puts control and nurture on each end of a dimension line called (C-N), as portrayed in Figure 9 (Sjøvold, 2007). The control and nurture functions are both necessary for a dynamic team functionality and shapes the team as a work unit. They form a dynamic duo, which when balanced ensures high maturity by avoiding frozen polarizations and subgroups in the team.

The (O-D) dimension encompass the way the team deal with external influences, and its ability to readjust and exploit unforeseen changes in its surrounding environment (Sjøvold, 2007). It balances out the internal cohesion with the ability to question the team’s decisions, which is a fundamental element in solving wicked problems and other demanding teamwork.

#### *2.1.5 Spin-Theory and Team Maturity: The (W-S)- dimension*

Moreover, there is a third dimension for team maturity, the withdrawal-synergy (W-S) dimension. A group functioning on a low maturity level, operating in the W-end of the (W-S)

dimension, typically has members that feel little shared commitment and have little or no motivation to step out of their comfort zone and learn (Sjøvold, 2007). The basic group functions that are not reflected in the team, yet are called for by the task at hand, must be taken on by the leader as a way of compensating (Sjøvold, 2007).

On the S-end on the (W-S) dimension, associated with high team maturity, not only the team as a whole but also the individual group members benefit from the group members' shared commitment. This entails willingness to assist and help unconditionally in order to reach success (Sjøvold, 2007). Higher levels of maturity also implies that the group members are able to take on several roles and thus support a wider selection of the basic group functions (Sjøvold, 2007). This requires a very high level of social skills from the group members, in addition to other ability prerequisites for high performance teamwork.

In general, for the group to develop to a higher level of maturity, learning is needed. Sjøvold (2006a, 2007, 2014) argue that consolidation of and increase in team maturity can happen through practical teambuilding which is set in the type of work situations that the team will face in their business. For learning to occur, group members must be willing to experience individual discomfort, and share commitment to the group and each of its members as well as the task the group is facing (Sjøvold, 2007). This is the essence of the (W-S) dimension, scaling from low team maturity at the withdrawal (W) vector, to higher team maturity at the synergy (S) vector.

#### *2.1.6 Spin-theory and Team Maturity: Four Levels of Team Maturity*

As a reflection of their team dynamics in play, groups can develop their level of team maturity. Spin-theory exemplifies team maturity by four levels of team maturity (Sjøvold, 2007). The categories are well defined and based on the basic group functions. They range from withdrawal to synergy in the following order: Reservation, team spirit, production, and innovation (Sjøvold, 2007).

**Reservation** is the lowest level of group maturity (Sjøvold, 2006a, 2007, 2014). Typically, a reservation level group is a group mostly in the fact that they share a purpose and task, and little else. The group is more of a gathering of individuals than one, close unit (Sjøvold, 2014). Criticism is normally tolerated to very little degree (Sjøvold, 2007). Roles become static and the formation of subgroups and permanent polarizations is frequent (Sjøvold, 2014). The reservation level group calls for a strong leader that delegates work and takes decisions on behalf of the group (Sjøvold, 2007). The members follow the leader and contribute with their individual parts, quite independently from each other (Sjøvold, 2014). For reservation to be a purposeful level of group maturity, the task at hand should be uncomplicated and unambiguous, and the context ought to be well-known and predictable (Sjøvold, 2014). This can for example be the case in organizations with strong central control and strict procedures. Also, the task needs to be so well-defined and structured that it can be divided into separate

parts that can be handled individually (Sjøvold, 2007). The moment a reservation level group is faced with complex or ambiguous tasks, and a volatile or unpredictable context, the team will not manage to meet the challenge (Sjøvold, 2014). It does not have the team dynamics necessary to provide innovative or multilayered solutions that call for a high degree of close and interactive collaboration, nor the ability to foresee and adapt to a changing context. In clearly defined situations with well-defined frames however, a reservation level group can prove itself highly effective (Sjøvold, 2014).

**Team spirit** is the second lowest level of group maturity on the W-S dimension (Sjøvold, 2006a, 2007, 2014). At this level of maturity, the group typically experiences strong cohesion yet still has a set role structure and strict adherence to rules and procedures (Sjøvold, 2014). The group members have a strong sense of “us” and anyone external is considered one of the “others” (Sjøvold, 2007). The leader is someone to look up to and gather around for the group (Sjøvold, 2014). For a team spirit group to be effective, the “others” need to be easily recognizable and distinctly separated from the “us” (Sjøvold, 2007). The tasks need to be simple and well defined, yet can demand a higher level of collaboration. The context should be stable and foreseeable (Sjøvold, 2007). If the right conditions are satisfied, a team spirit group can operate extremely effectively and efficiently due to its strong need to prove itself as a group compared to others, in combination with a sincere respect for procedures and rules, and no tendency to question the status quo or how things are done (Sjøvold, 2007). The highest effectiveness and efficiency typically occurs in situations characterized by a simple task that demands focused teamwork over a short time period (Sjøvold, 2014).

**Production** is the second highest level of group maturity (Sjøvold, 2006a, 2007, 2014). At the production maturity level, the group has strong cohesion and the members are able to collaborate on a high level. The team also seeks resources from outside the team itself (Sjøvold, 2007). Group members respect each other’s fields of knowledge and expertise (Sjøvold, 2014). The cohesion of the group happens through long term contributions and commitment of the team members (Sjøvold, 2014). The team members show initiative and seeks out solutions for the task(s) at hand (Sjøvold, 2007), which facilitates the team to be flexible in its work (Sjøvold, 2014). The need for leadership is limited, in the sense that team members of a production team are capable of structuring and organizing their own work (Sjøvold, 2007). The production group can be highly effective in situations that call for self-management and an independently functioning team, within a stable context (Sjøvold, 2007). The production team can handle complex problem solving due to its well-functioning collaboration and sharing of resources, also incorporated for its surroundings (Sjøvold, 2014). However, a disruptively unstable and unpredictable context will throw it off balance, as the production team is not able to develop truly innovative solutions. The team at the production maturity level thrives with long timelines, a focus on quality and little waste, as well as only responding gradually and incrementally adapting to changes in the context (Sjøvold, 2014). Moreover, the group will constantly seek to improve itself, although never truly challenging or changing the core of itself.

**Innovation** is the highest level of group maturity, which lies in the synergy end on the (W-S) dimension (Sjøvold, 2006a, 2007, 2014). The maturity level of innovation entails that the team can be extremely high performing, and manage complex problem solving with truly innovative solutions. At the innovation maturity level, the group has a strong cohesion and well-founded trust (Sjøvold, 2007). This creates a strong group culture. Moreover, it enables the group to be critical of itself and the members of each other. The communication is typically very lively and humorous, and the group is highly creative (Sjøvold, 2007). All basic group functions are supported by all of the team’s members, and the shift between the basic group functions happens fluidly and with high frequency (Sjøvold, 2014). The group is in active interaction with its environment and incorporates ideas and information (Sjøvold, 2007). On the innovation level of maturity, leadership is incorporated by the team as a whole (Sjøvold, 2014). There is no such notion as the “right” way in an innovation group (Sjøvold, 2014). That means that norms, procedures and plans are constantly challenged. The innovation maturity level also include that the team bear no scruples for tossing aside entire frameworks or plans if they judge it beneficial for their end product. The team with an innovation maturity level needs freedom to exploit its full potential (Sjøvold, 2014). The team needs to be challenged with complex problems, and a volatile, unforeseeable context for it to reach its full potential. Change is key for this type of team maturity. Strict rules and procedures, and strongly enforced leadership, will smother the team’s potential and create great frustration among its members (Sjøvold, 2014).

The following table summarizes the four team maturity levels, and which type of context and task they are best fit to operate in/for.

*Table 1 - Team Maturity Levels’ Ability to handle Certain Context and Task Complexity*

<b>Team Maturity</b>	<b>Context</b>	<b>Task</b>
<i>Reservation</i>	Stable, predictable	Low complexity, independent contributions.
<i>Team Spirit</i>	Stable, predictable.	Low complexity, high efficiency operations, high need for cooperation.
<i>Production</i>	Only small, incremental changes.	Higher complexity, higher need for collaboration.
<i>Innovation</i>	Disruptive and unpredictable.	High complexity tasks, developing creative and truly innovative solutions, high-level collaboration.

### 2.1.7 The Entrepreneurial Team

Schjoedt and Kraus (2009) suggest that an entrepreneurial team can be defined as two or more individuals who have come together to achieve particular objectives, and who hold a shared commitment to the entrepreneurship. Most management organization literature separate between group and team, and typically define three or more people as one of the criteria for being denoted as a team. This is based on the theory of Simmel and Wolff (1950), explaining the complex dynamics of the triad versus a dyad. The definition presented above however, focus especially on the entrepreneurial team being more than a group in that there is a shared commitment towards the entrepreneurial team as a whole and the performance of the team (Schjoedt & Kraus, 2009). In this study, the definition of Schjoedt and Kraus (2009) is applied, although moderated for the normative separation of the dyad and the triad according to Simmel and Wolff (1950) and that different maturity levels will also entail difference in commitment.

Thus, in this study the following definition of entrepreneurial team is applied:

*An entrepreneurial team is three or more people that work together to achieve specific objectives for the entrepreneurship.*

Despite most new ventures being started by teams (Ensley, Carland, & Carland, 1998; Muñoz-Bullon, 2015), relatively little research has been devoted to this specific intersection of entrepreneurship and team theory (Forbes et al., 2006; Schjoedt, Monsen, Pearson, Barnett, & Chrisman, 2013; West, 2007). Neither has a substantial amount of studies considering the behavioral perspective on entrepreneurial teams been identified (Schjoedt et al., 2013).

On the other hand, the moderate amount of literature that does exist, has found consensus on one thing; the importance of teamwork for entrepreneurs' successfulness (Kotey, 2007; Robinson & Stubberud, 2014; Schjoedt & Kraus, 2009; Schjoedt et al., 2013). This is in part explained by the fact that a team will outperform an individual cognitively (West, 2007). For instance, the entrepreneurial team outperforms the individual in creativity, which is a driver for innovation capability (Chen, 2007). Furthermore, with increasing task complexity (which innovation work typically incurs), team dynamics is increasingly important for successfulness (Kotey, 2007; Shepherd & Krueger, 2002). Leadership within the team can have importance for stimulating and regulating the entrepreneurial teams' team dynamics in a positive way for innovations (Chen, 2007; Chowdhury, 2005; Cooney, 2005; Flamholtz, 2011; Schjoedt & Kraus, 2009). For instance, such incorporated leadership can increase commitment and ownership.

## 2.2 Innovation Capability



### 2.2.1 Definition of Innovation Capability

Through the literature review performed for this Master's thesis it is apparent that innovation capability lacks a normative definition in existing literature (Iddris, 2016; Samson & Gloet, 2013; Saunila & Ukko, 2014). This, however, does not mean that the topic is not amply covered in recent papers and is increasingly receiving attention within both academia and management. In this thesis, the definition of innovation capability that is applied is, quite simply:

*Innovation capability is the ability to create innovations, originating from a collection of factors that facilitate and promote innovation.*

The simplicity of the definition is consciously chosen, as it focuses on the very core of the matter. So many elements are baked into the concept innovation capability and one could easily make ten different, very specific, and mutually exclusive definitions of innovation capability. This single, simple definition will still hold for all these other definitions, in which lies its robustness. Sometimes, "simplicity is the ultimate sophistication", as Leonardo Da Vinci once stated (Deger & Gibson, 2006).

Now, as we have this simple definition as a foundation, we shall elaborate on more specific ways of addressing innovation capability. Depending on the focus of the study, innovation capability is defined in several different ways, however typically it is defined as a higher-order construct of several elements (Saunila & Ukko, 2014). This is in line with applying a perspective of dynamic capability theory, combining both functional and integrative capabilities in a higher-order construct (Lawson & Samson, 2001). Table 2 below displays a selection of definitions of innovation capability. Furthermore, the link to firm performance is also briefly presented, as this is central in this study.

Table 2: Innovation Capability

<b>Reference</b>	<b>Definition of innovation capability</b>	<b>Connection to firm performance</b>
<i>Vicente, Abrantes, and Teixeira (2015, p. 5)</i>	“Innovation capability is a higher-order construct composed of innovativeness, technological capabilities, innovation strategy and new product development capability dimensions that should be assessed at the individual level.”	“Innovativeness, technological capabilities, innovation strategy, and new product development capability are positively related with annual export venture performance. Managers must also emphasize the importance of innovation capability for the firm’s success.”
<i>Saunila and Ukko (2014, pp. 33-34)</i>	“Innovation capability is defined as the drivers of innovation; i.e., the aspects that influence a firm’s ability to manage innovation. According to the literature, these aspects include support culture, employees’ skills and innovativeness, employees’ welfare, leadership practices, processes and tools for managing ideas, development of individual knowledge, and links to strategic goals.”	“The successful operation of firms in almost all industries is becoming highly dependent on the firms’ abilities to produce innovations.” “Due to the special features of SMEs, the potential for innovation is observed as more important than the commercial end.”
<i>Saunila, Pekkola, and Ukko (2014, pp. 234-235, 243, 245 )</i>	“Performance measurement can thus be used as a tool for improving SME performance through innovation capability.” “Beyond providing empirical support for the innovation capability-firm performance relationship, this study confirms the role of performance measurement as an important moderating link.”	“A firm’s capability to produce innovations has been suggested to be crucial for its success.” “Innovation-oriented SMEs have somewhat better opportunities to succeed also financially.” “Firms that measure the determinants of innovation capability, especially through active exploitation of external knowledge, are more likely to engage in a higher level of innovation capability, which in turn has a positive impact on their performance.”
<i>Samson and Gloet (2013, pp. 6448, 6462)</i>	“Nevertheless, moving towards sustained innovation capability requires energy, persistence, determination, knowledge and resources. Sustained innovation capability also requires a strategy supported by resources, measures, rewards and recognition of staff efforts. Ultimately, a strong and	“In competitive global environments, innovation is a key not only to survival but also to delivering competitive advantage.”



	determined leadership must drive the strategy. This study also suggests that systematic innovation capability requires close alignment between various elements of innovation.”	
<i>Iddris (2016, pp. 235, 245)</i>	“(…) innovation capability refers to a firm’s ability to generate innovation through continuous learning, knowledge transformation, creativity, and exploitation of internal and external resources available to the firm.”	“The recent rapid changes in technology, consumers’ taste, preferences, and general market condition means that post-industrial organizations’ survival and success depend on capability to be innovative.”
<i>Hogan, Soutar, McColl-Kennedy, and Sweeney (2011, pp. 1, 3)</i>	“(…) innovation capability as a firm's ability, relative to its competitors, to apply the collective knowledge, skills, and resources to innovation activities relating to new products, processes, services, or management, marketing or work organization systems, in order to create added value for the firm or its stakeholders.”	“An ability to innovate provides a strong basis for organizations to obtain and sustain superior performance and competitive advantage.”
<i>Guo and Zhou (2016, p. 335)</i>	“We measure innovation capability by tracking changes in R&D expenses, numbers of products, patents, and strategic alliances, as well as product development.”	“We find that innovation capability is critical to contemporaneous stock performance and eventual firm survival.”

A significant research gap in former literature, is that innovation capability has been studied via a single or very few indicators, which is not considered satisfactory by more recent literature (Vicente et al., 2015). By incorporating several perspectives in the development of the construct for innovation capability, the construct should gain robustness. Appendix 2 portrays all the elements that are selected and incorporated in the construct that is created for this thesis. The 30 papers that were selected as the theoretical basis for measuring innovation capability in this study presented definitions and applications of the concept that varied fully or in part. Note then, that the author has carefully selected certain perspectives that seem the most applicable for this study.

Based on the definitions presented above, and the literature review on innovation theory, the construct for measuring innovation capability in this study is made. There are five main perspectives that have been selected to be incorporated in the construct: Innovation dimensions, strategic resource based (SRB) view on competence and technology, SRB view on human capital, management and internal processes, and innovation and teamwork (Table 3).

*Table 3 - Theoretical Perspectives on Innovation Capability*

	<b>Perspective</b>	<b>Code</b>
<i>Innovation Capability</i>	Innovation dimensions	I
	SRB view: competence and technology	II
	SRB view: human capital	III
	Management and internal processes	IV
	Innovation and teamwork	V

It has been found that different contexts of the business also affects the considerations that should be taken for the innovation capability construct (Hogan et al., 2011). Note therefore, that in this paper, Innovation capability is applied with consideration of entrepreneurial teams and is thus defined as a construct of several elements that apply for this context.

First, to structure our understanding of innovation capability further, the author presents a theoretical basis for understanding sources to innovation, i.e. factors that can build innovation capability. Following that, a detailed explanation of the five different perspectives that is included in the development of the innovation capability construct that is made in this thesis is presented in the next five subchapters (2.2.3 to 2.2.7).

### *2.2.2 Definition and Sources of Innovation*

The reason why innovation capability has no normative definition, is in part that there is no single, clear-cut understanding of the sources to or drivers of innovation that applies in all cases and for all contexts. The other part of the reason is simply that there is no single definition of innovation itself (Vicente et al., 2015).

So, as innovation capability is derived from innovation, it is natural that we include a look at some of the definitions and origins of innovation. One of the more common and simplistic ways of understanding innovation is “putting new ideas into practice” (Robinson & Stubberud, 2014, p. 187). Another way to define innovation is (the attempt) to carry out new ideas into practice (Fagerberg, 2006b). Note the focus on not just creating something new, but actually putting it into practice in both definitions.

*Innovation:*

*“Putting new ideas into practice” (Robinson & Stubberud, 2014, p. 187)*

*(Attempt to) carry new ideas into practice (Fagerberg, 2006b)*

Also, the sources to innovations can be many, and is a research field of itself with much yet to discover and understand. This is the field that touches upon the construct we are building for innovation capability. Table 4 portrays some of the most common ways of explaining sources to innovation. Note that the rightmost column shows the code that explains how theory is linked to the five perspectives on innovation capability (Table 3).

*Table 4 - Sources to Innovation*

<b>Reference</b>	<b>Source(s) to innovation</b>	<b>Keyword(s)</b>	<b>IC Code*</b>
<i>Ancona and Bresman (2006); (Chen, 2007); De Dreu (2006); Robinson and Stubberud (2014)</i>	Innovation find its roots in creativity	Creativity	III
<i>Politis (2003); Wong, Tjosvold, and Liu (2009)</i>	Intra-team trust boosts innovation via better external relationship exploitation.	Psychological safety, External exploitation	II III
<i>(Blanco-Mesa, Merigó, &amp; Kacprzyk, 2016; Robinson &amp; Stubberud, 2014)</i>	A stimulating, yet safe environment is a prerequisite for innovation		
<i>Blanco-Mesa et al. (2016); Castellacci et al. (2005); Edmondson (2013)</i>	Diversity drives innovation.	Diversity	I III
<i>Ancona and Bresman (2006); De Dreu (2006)</i>	Diversity can promote positive task-conflict, which is positive for innovation.		
<i>Castellacci et al. (2005)</i>	Innovation requires the exploration and exploitation of opportunities.		II IV

<i>Ancona and Bresman (2006); Fagerberg (2006a)</i>	The company's absorptive capabilities and ability to learn vicariously are fundamental for innovation.	Opportunity exploration/ exploitation	
<i>Castellacci et al. (2005)</i>	Innovation calls for integration of specialized knowledge. Knowledge is often tacit and individual.	Teamwork, knowledge, human capital	II
<i>Bossink (2004)</i>	Extensive knowledge and competence related to the innovation area is crucial.		III
<i>Dackert et al. (2004); Edmondson (2013)</i>	The team is the natural venue for innovation as it allows for dynamic activity and learning with diverse specialist competence.		V
<i>West and Anderson (1996)</i>	Team dynamics in the innovation team is especially important for the overall level of innovation.		
<i>Scholten, Van Knippenberg, Nijstad, and De Dreu (2007)</i>	Soft skills and intra-team dependence promotes innovation via improving information-processing.		
<i>Castellacci et al. (2005)</i>	Innovation requires learning in circumstances of uncertainty.	Learning, uncertain context	III
<i>Benner and Tushman (2003)</i>	A disruptively changing context will demand more than incremental innovation from the team for success.		
<i>Brouwer (1991); Galindo and Méndez-Picazo (2013)</i>	Innovation, entrepreneurship and economic growth have an interdependent, recursive relationship	Innovation- entrepreneurshi p-economic growth link	IV
<i>Crumpton (2012); Dackert et al. (2004)</i>	Leadership must be present in all stages of innovation.	Management, innovation strategy	IV
<i>Deschamps (2005); Edmondson (2012, 2013)</i>	Innovation leadership should be adapted to the innovation strategy.		V
<i>Bel (2010); Dackert et al. (2004)</i>	Innovation leadership should be embedded in the innovation team.		

\*See Table 3 (table above) for explanation of the IC codes

From the table, we shall have gained some understanding of the theoretical backdrop for developing a way to measure innovation capability. In the following, the five innovation capability perspectives I-V shall be described for further insight.

### 2.2.3 Innovation Dimensions

Innovation can occur in many forms, as visualized in Figure 10. Innovation in an entrepreneurship can be either be related to what the entrepreneurship makes or sells, or it can be related to how the entrepreneurship works and operate (Brouwer, 1991; Castellacci et al., 2005; Fagerberg, 2006b; Hogan et al., 2011). In the first case, the innovation can take form of a new or improved service or product (Hogan et al., 2011). In the second case, the innovation can reform processes and the organization internally in the entrepreneurship (Castellacci et al., 2005; Fagerberg, 2006a; Hogan et al., 2011).

Often, internal innovations will promote external innovation capability, as well as profitability (Hogan & Coote, 2014; Laforet, 2013). For example, innovations in organizational structure can facilitate better for radical innovations through discovery, incubation and acceleration (Hogan & Coote, 2014).

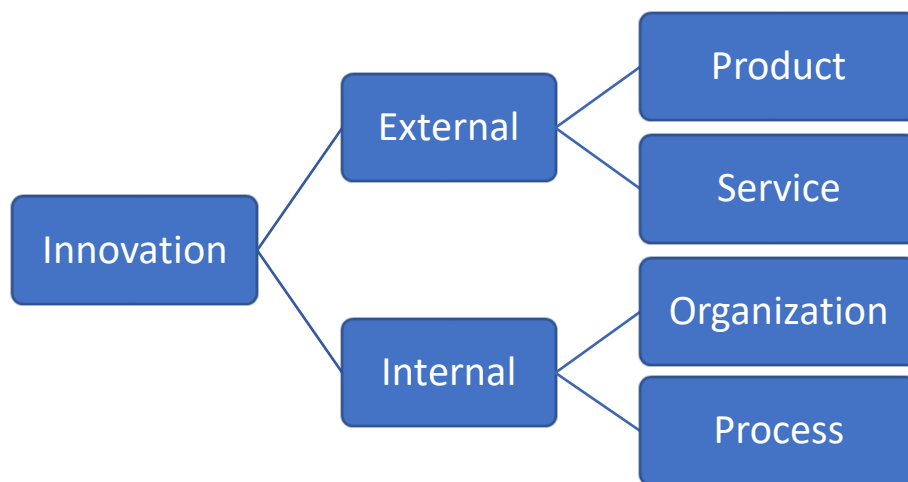


Figure 10 - Types of Innovation

Moreover, the approach to innovation can also vary depending on the type of innovation in question (Hogan & Coote, 2014). For instance, it is found that product innovations in manufacturing are typically defined by a rigid process, whereas service industry innovation is less formalized (Samson & Gloet, 2013). Moreover, the degree to which the innovation can be considered incremental or radical also affects how strategy and management for innovation capability should be adapted (Hogan & Coote, 2014). Thus, the context of the innovations affects how innovation capability should be addressed.

### 2.2.4 Strategic Resource Based View: Competence and Technology

Following a strategic resource based view, a company's internal resources are considered the source of competitive advantage when they are valuable, rare, and difficult to imitate of

substitute (Barney, 2001; Peteraf, 1993) (in Norwegian known as the VRIN-model). As Vicente et al. (2015) defines innovation capability, technology capabilities assessed at the individual level is in the very center of the concept. Meaning, technological competence is an internal resource at the very core of innovation capability. Furthermore, technological innovation is seen as a higher-order innovation dimension, which include both internal (process) innovation and external (product/service) innovation (Atalay et al., 2013; Hogan et al., 2011).

Within competence, strategic alliances, networks, and client-involvement are examples of external sources for innovation (Samson & Gloet, 2013). Organizational learning and other exploitation of such external sources have been proven to boost innovation capability (Iddris, 2016). Thus, nurturing such external relations and improving on nurturing them, can be an important positive competence for the firm's innovation capability.

Thus, the competence- and technology perspective sees these two dimensions as a means for the company to perform well and stay in business over time (Hogan et al., 2011). This is facilitated by keeping ahead of the market through the development new technology and/or use of technology in new ways, and the competence that is interconnected with this (Vicente et al., 2015). Such competence is often tacit (Saunila & Ukko, 2014).

Developing and implementing a successful innovation strategy is another important competence area for promoting innovation capability (Iddris, 2016; Vicente et al., 2015). For example, a product launch strategy, targeting focus, timing, marketing mix and bundling, may be the decisive element of a new innovative product's success or fail in the market (Hogan & Coote, 2014). Innovation strategy is the means that facilitate for internal and external resources to contribute to innovation. Innovation strategy should incorporate all aspects of how to generate and foster innovation capability (Saunila, Pekkola, et al., 2014; Saunila, Ukko, & Rantanen, 2014) , as well as include specific strategic goals (Samson & Gloet, 2013).

#### *2.2.5 Strategic Resource Based View: Human Capital*

In terms with the definition of innovation capability as a higher-order construct by Vicente et al. (2015) (see Table 2), it is very interesting to note that all elements of the construct focuses an assessment at an individual level. Meaning, the value-adding competence and resources are locked in human capital. Therefore, one of the internal resources that is most influential to innovation capability is human capital and the management of which.

Human capital is extremely central for innovation capability, as it is mostly the competence and properties of individuals which form the basis for innovation. Typically, valuable competence linked to the individual is tacit and non-codifiable (Saunila & Ukko, 2014). Such competence is part of and inseparable from the technology savviness of the firm. However,

human capital covers much more than just this, as it is the human creativity and idea-generating ability which forms the basis of innovation (Ancona & Bresman, 2006; De Dreu, 2006; Robinson & Stubberud, 2014; Thompson & Choi, 2006). Furthermore, it has been found

that for human capital to contribute to innovation, a psychologically safe and supportive environment with room for creativity and trial-and-error is key (Edmondson, 2013; Saunila & Ukko, 2014).

#### *2.2.6 Management and Internal Processes*

Human capital may be the foundation for innovation, however without the right support allowing for this resource to come to use, it cannot contribute actively to innovation capability. Hogan et al. (2011) underline the importance of management that addresses and promotes innovation capability. Without said focus and support in management, innovation capability will suffer (Crumpton, 2012; Hogan & Coote, 2014). Part of successful innovation management is therefore facilitating for and generating an organizational culture which promotes innovation capability (Hogan & Coote, 2014). For example, such organizational characteristics can be a psychologically safe and supportive environment with room for creativity and trial-and-error (Edmondson, 2013; Saunila & Ukko, 2014).

Moreover, part of a successful management of and strategy for innovation capability is managing creativity and idea-generating processes and procedures well, which are two crucial contributions to innovation capability (Hogan & Coote, 2014; Saunila & Ukko, 2014). For instance, they are elements of the firm's new product development capability (Vicente et al., 2015). Furthermore, as innovation is in its core change or an answer to change, suitable change management is an important factor in innovation capability (Assink, 2006; Tushman, 1997).

Moreover, operational performance indicators are critical for assessing the performance of any innovation strategy (Hogan & Coote, 2014). Furthermore, the effect of competence and technology and other elements of innovation capability on the firm performance of the company is found to be moderated by operational performance indicators (Vicente et al., 2015). Performance indicators have thus been found to be an important moderating link between innovation capability and firm performance (Saunila, Ukko, et al., 2014). This would make it natural to incorporate performance indicator use in the firm's internal processes for improvement.

Moreover, it has been long established that there are many other potential beneficial side-effects of introducing performance indicators. For instance, it can result in increased organizational and team-learning, focusing a team effort towards a common goal, increase motivation and mutual accountability, and encourage development and improvement (Mendibil & MacBryde, 2005). Thus, not only does performance indicators hold the potential to boost the effect of innovation capability, it can also have a feedback effect, boosting innovation capability in itself.

### *2.2.7 Innovation and Teamwork*

It has been found that groups outperform individuals with regards to being more innovative (Nijstad & De Dreu, 2002). Edmondson (2013) explains this simply by the team allowing for dynamic activity and learning, which makes it a natural venue for innovation. Teams can be more creative than the individual by aggregating individual creativity, which also makes the team have better innovation capability (Chen, 2007; Kurtzberg & Amabile, 2001; Taggar, 2002). However, the team creativity will typically depend on the team climate for creativity (McAdam & McClelland, 2002; Pirola-Merlo & Mann, 2004; Zhu, Gardner, & Chen, 2016).

A dynamic interplay of processes and interactions on the individual, group and organizational context levels of the group will define its outcomes of innovation (Dackert et al., 2004). West and Anderson (1996) found that the level and quality of innovation developed in a team setting depended on group size, resources, team tenure, group processes, and proportion of innovative team members.

In specific, it has been found that social processes, i.e. team dynamics and hereunder team maturity, is especially important for the overall level of innovation (West & Anderson, 1996). Dackert et al. (2004) also argue that the interaction between group members and external influences will strongly affect the group climate for innovation.

Summarized, figure 11 is designed by the author to present a simplified visualization of the innovation capability construct of this study.



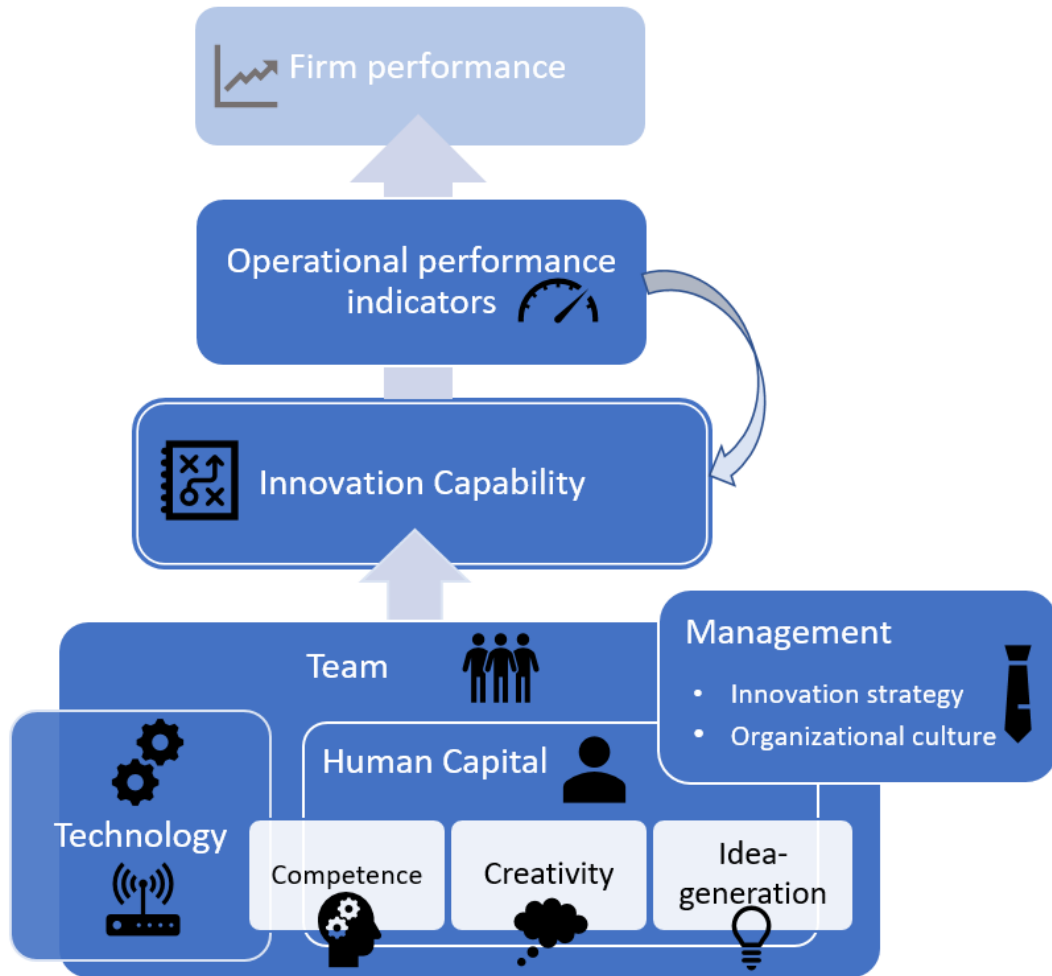


Figure 11 - Visualization of Innovation Capability

### 2.2.8 University Program Influence on Innovation Capability



There has been a great shift in how companies are organized and operate as a result of the game-changing technological development the latter couple of decades, as information accessibility, and communication and collaboration have been greatly enhanced (Altman, Nagle, & Tushman, 2014). As a result of this, the way innovations occur is also altered. It is increasingly typical that innovations have an external locus and that teams and companies collaborate in networks with system-level goals (Altman et al., 2014). Moreover, it is found by several studies that such networks of partners and strategic alliances will boost innovation capability (Guo & Zhou, 2016; Iddris, 2016; Samson & Gloet, 2013).

A University Masters' Program for entrepreneurship is an example of such a network. Not only are such networks growing more and more common, it has also found to be a direct link between these networks and innovation capability. Blanco-Mesa et al. (2016) found that a co-working space for entrepreneurs provides conditions that foster creativity, diversity and

innovation. Castellacci et al. (2005) also found that there is a feedback-effect between operating centrally in such networks and the ability to innovate.

## 2.3 Firm Performance

### 2.3.1 Definition of Firm Performance

It is crucial to measure firm performance accurately in order to understand new venture success or failure (Murphy, Trailer, & Hill, 1996). However, evaluating firm performance can be demanding as it is a multidimensional concept (Atalay et al., 2013; Delen, Kuzey, & Uyar, 2013).

The way firm performance is defined in this thesis, can be formulated as follows:

*Firm performance is a measure of how well the firm is doing currently and how well it seems that the firm will be doing in foreseeable future, measured through critical financial ratios.*

The way the author has chosen to define firm performance is specific for the study in this thesis. It is one way among a vast amount of ways it could have been defined. The basis for choosing this definition is the theory of this subchapter, as shall be presented subsequently.

A firm performance analysis can be performed through many different approaches, such as a consequential financial analysis or a departmental production analysis (Atalay et al., 2013). Additionally, the data obtained can be subjective or objective. Objective data is typically financial ratios such as liquidity, profitability or long term solvency (Delen et al., 2013). However, Murphy et al. (1996) argue that all data is to some degree subjective. The way the data is obtained decides if it is considered of primary or secondary source (Murphy et al., 1996).

However, obtaining purely objective data such as hard financial indicators can be challenging (Atalay et al., 2013). For example, one typical issue might be that such information is not publicly accessible. Therefore, it is often chosen to collect more subjective data for evaluating firm performance. On the other hand, subjective data can cause difficulty with regards to construct validity and comparability of results.

Moreover, there has been a lack of conscious, structured methods in studies assessing firm performance of entrepreneurs (Murphy et al., 1996). Many different indicators has been applied, all too often without presenting justifications for the choices made according to

Murphy et al. (1996). Therefore, a carefully assembled theoretical foundation is the basis for the construct developed for this study, in order for it to be justified properly.

The selection of relevant firm performance indicators which has been carefully considered to be applied in this study is summarized in Table 5.

*Table 5: Firm Performance Indicators*

<b>Reference</b>	<b>Firm performance indicator</b>	<b>Definition</b>	<b>Question it answers</b>
<i>(Berk &amp; DeMarzo, 2014; Delen et al., 2013; Murphy et al., 1996)</i>	Liquidity	The ability to pay short-term debt	Do they have enough cash holdings for the near future?
<i>(Berk &amp; DeMarzo, 2014; Bosma, Van Praag, Thurik, &amp; De Wit, 2004; Delen et al., 2013; Investopedia, 2015; Loth, 2017; Murphy et al., 1996)</i>	Profitability (Net profit margin, ROCE)	Profit-generating ability based on sales, assets and equity	Are they making money?
<i>(Berk &amp; DeMarzo, 2014; Delen et al., 2013)</i>	Long term solvency	Ability to meet long-term financial obligations (Survival/avoiding bankruptcy)	Will they survive longer than just the immediate future?
<i>(Berk &amp; DeMarzo, 2014; Delen et al., 2013; Stockopedia, 2017)</i>	Solidity	Degree of leverage to finance the firm. Resilience.	How heavily are they in debt? Are they vulnerable to changes in interest etc., or more resilient?
<i>(Delen et al., 2013; Murphy et al., 1996)</i>	Growth: sales	Sales and profit growth	How will they develop onwards? (Based on prior growth)
<i>(Bosma et al., 2004)</i>	Growth: personnel	Increase in employees	How has the firm grown in numbers of people? (Indicates an expansion of business)
<i>(Murphy et al., 1996)</i>	Size (financial)	Sales and cash flow levels, current ratio	What is the value extent of their business?
<i>(Murphy et al., 1996)</i>	Success/failure	Discontinued business, researcher assessment	Will they stay in business, or have they failed?

<i>(Murphy et al., 1996)</i>	Market share	Size of market for services/products	How big are they compared to their competitors?
<i>(Murphy et al., 1996)</i>	Leverage	Debt to equity	How much in debt are they?
<i>(Bosma et al., 2004)</i>	Hazard of ownership	Time of existence	How is the survival time of the firm?
<i>(Murphy et al., 1996)</i> <i>(Peng 2000)</i>	Efficiency	Return on investment, equity, assets and net worth	How good is the company at transforming capital and assets into added/new value?

As can be seen from Table 5, profits is clearly the performance indicator that is applied most frequently. Two similar indicators, return on assets (ROA) or return on equity (ROE) are often applied in financial studies, and offer more accuracy (Murphy et al., 1996), however as both equity and assets can vary extremely for different types of entrepreneurships based of business area etc., profitability is judged as a more suitable measure for the specific context of this study.

### 2.3.2 A Construct for Measuring Firm performance

Although financial ratios may be hard to access, they are evaluated as the most objective and universally applied measures, which facilitates for comparison (Delen et al., 2013). Moreover, it has been found that such financial ratios offer insight in the likelihood of bankruptcy or good performance, functioning as a symptomatic variable with underlying factors such as poor business plans etc. (Foreman, 2003). Therefore, a construct made from a selection of financial ratios is judged to give the most objective measure of the firm performance in this study. Just as explained for innovation capability in ch. 2.2.1 Definition of Innovation Capability, a construct of several indicators increases the robustness of the variable for measuring firm performance (Vicente et al., 2015). Furthermore, the collection of such data can be done through a survey (primary sourced), which is more time efficient than interviews etc. for retrieving data.

Based on what is presented above, and a thorough literature review, the indicators that have been selected to measure firm performance in this study are: liquidity, profitability, solidity and sales growth. These indicators assess the financial health of the company, and this type of combination of indicators has been found purposeful for this endeavor in previous studies (Laitinen, 2016). Moreover, they allow for comparison across firms (Delen et al., 2013). A combination of primary and secondary sources will be used to retrieve the data. Below is a concise run-through of the chosen indicators. The ratios are calculated based on the accounts from last year (year x) and the year before (year (x-1)).

### 2.3.3 Liquidity

Liquidity is one of the most commonly used firm performance indicators (Delen et al., 2013). It considers the ratio of current assets with regards to short term debt. In layman's terms, it is a measure of how capable the business is to meet its financial obligations in the short term (Berk & DeMarzo, 2014). Furthermore, the liquidity also limits what the entrepreneurship can engage in of procurements and other expense-demanding investments (Cerqueiro & Penas, 2016; Quadrini, 2000).

(1.1)

$$\text{Liquidity} = \frac{\text{Current Assets}}{\text{Short Term debt}}$$

### 2.3.4 Profitability

Profitability is perhaps the most popular financial ratio used for assessing a firm's financial health (Murphy et al., 1996). However, there are many ways of measuring profitability. In this study, the return on capital employed (ROCE) ratio is chosen to be applied. It directly assesses the profits that the firm accumulate, and considers the equity and debt of the firm. Thus, this ratio tells us the profit-generating ability of the firm, i.e. whether they are making any money on their business. Note however, that it is also to expect that entrepreneurships have lower profitability than established firms. This is in part explained by the growth-profitability tradeoff, where the need for growth induce investments and asset expenditure that will lead to lower overall profitability (Zahra, 1993).

(1.2)

$$\text{Profitability (\%)} = \frac{(\text{Ordinary Profits before Tax+Financial Costs}) \times 100}{\frac{(\text{Sum Debt and Equity year (x-1)} + \text{Sum Debt and Equity year x})}{2}}$$

### 2.3.5 Solidity

Solidity is also one of the most commonly used firm performance indicators (Murphy et al., 1996). Basically, solidity measures the ratio of equity to the total assets, i.e. the sum of equity and debt. This ratio indicates the company's leverage used to finance the firm. There is no ideal leverage, yet a high solidity is favorable to a low solidity. Entrepreneurships are typically dependent on leverage as they face restrictions in equity yet need to make investments in order to generate revenue (Dees, 1998). The solidity ratio gives an indication of the firm's resilience, and is useful for comparisons between (similar) firms.

(1.3)

$$\text{Solidity (\%)} = \frac{\text{Sum Equity} \times 100}{\text{Sum debt and Equity}}$$

### 2.3.6 Sales Growth

Growth is also one of the most common firm performance indicators, especially sales growth (Murphy et al., 1996). Actually, some go as far as stating that growth is the most important financial ratio to predict firm performance (Delen et al., 2013). This is because growth indicates something about how the company may develop in the future, based on how it has developed so far. In specific, sales growth indicates whether the sales income is likely to increase or decrease, judging from the recent development. Furthermore, sales growth is a good indicator for entrepreneurs in specific, as growth is of fundamental importance for entrepreneurs (Covin, Green, & Slevin, 2006). Moreover, growth and profitability are two complimentary measures, as growth can be said to be a measure of the effectiveness and profitability of the efficiency of the entrepreneurship (Covin et al., 2006).

(1.4)

$$\text{Sales growth (\%)} = \frac{\text{Sales year (x-1)} - \text{Sales year (x)}}{\text{Sales year x}}$$

### 3.3.7 University program influence on Firm Performance



Castellacci et al. (2005) and Lechner and Leyronas (2009) are two examples of several researchers who have found that small, young and newly established firms benefit the most from collaborating in interorganizational networks. Collaborative entrepreneurship is especially relevant when it comes to allocating necessary resources for the venture, and for facilitating opportunity exploitation, but is also found to have great importance for knowledge management (Franco & Haase, 2013). Furthermore, alliances allow for risk-sharing. Stam and Elfring (2008) also found empirical evidence that a central position with extensive ties in such a network will correlate positively with entrepreneurial teams' performance.

Until the 1980s, it was generally assumed that entrepreneurship could not be taught in a classroom-setting (Kotey, 2007). Recent studies contest this however, and today universities offer studies that can attribute relevant competence for entrepreneurship (Kotey, 2007). University entrepreneurship programs may not only teach important aspects of entrepreneurship, it may also function as a venue for collaboration and networking. Muñoz-Bullon (2015) found that team, industry and startup experience increased the ability of entrepreneurs to mobilize team resources and create profitable new ventures. Thus, such university programs can provide both theoretical knowledge and practical experience which should increase the success rate of the entrepreneurs that are created from these programs.

### 3. Methodology

In this chapter, the methodology of the thesis will be presented. Throughout the process, there has been applied a recursive way of working, as represented by Figure 9. Meaning, previous steps have been adjusted along the way as new information has occurred through subsequent steps of the process. A description of the research design follows below the figure.

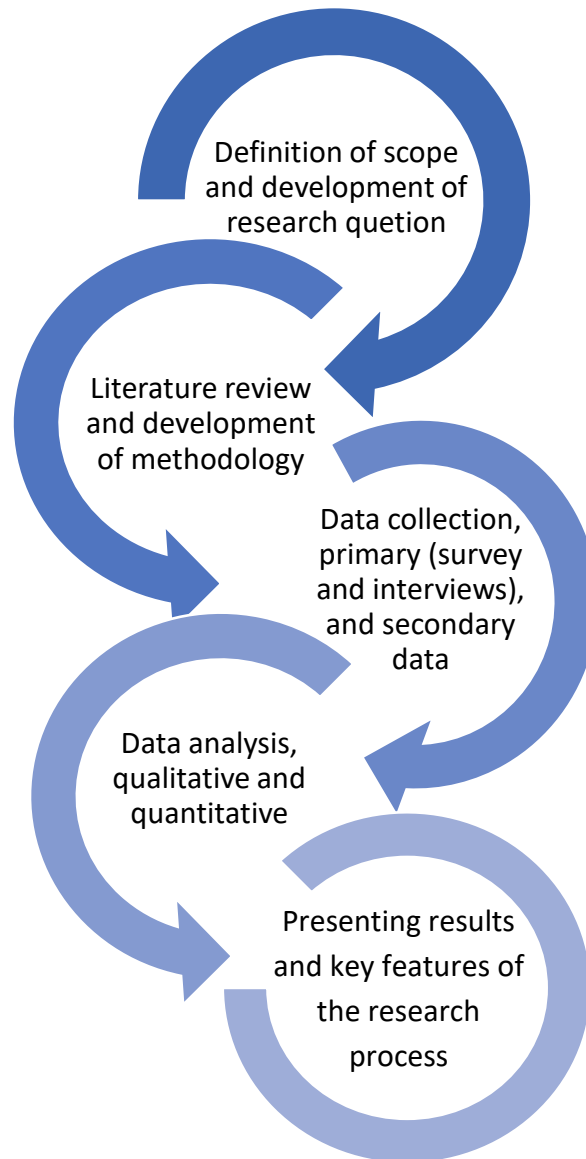


Figure 12: Illustration of the Iterative and Recursive Work Process

First, the definition of scope and development of research question for this Master’s thesis is in part founded upon previous work from the pre-diploma thesis “Team Dynamics and

Entrepreneurship – Which teams manage to keep the boat afloat?” (Noergaard, 2016). This is further strengthening the comprehensive theoretical foundation upon which this Master’s thesis is based. Furthermore, the scope has been consciously formed so that it is narrow enough to bear concrete and interesting results, yet wide enough for the results to be applicable for a certain extent. Thus, the thesis aspires to offer a useful contribution to the literary fields of team dynamics, innovation and entrepreneurship.

The data was collected from Norwegian entrepreneurships. The sample population is further divided in three sub categories:

- Group 1: One group of which the entrepreneurships are issued from an entrepreneurial Master’s program and which have participated in a longitudinal study on team dynamics (SPGR).
- Group 2: A second group, of which the entrepreneurships are issued from an entrepreneurial Master’s program, however with only current data on team dynamics (SPGR).
- Group 3: A third group, constituted of entrepreneurships with no relation to the entrepreneurial Master’s program.

These sub categories offer greater variety in the data material, and can also have a control function that helps discovering potential hidden factors in certain subgroups that may have affected the results of the study. Additionally, one entrepreneurship was examined in further detail as a case study.

Several networks, clusters and accelerators for entrepreneurships were approached and helped provide lists of relevant entrepreneurships: NTNU Accel, BI Startup, Startuplab, Oslo Tech, School of Entrepreneurship NTNU, Oslo Business Region and StartupMatcher. After assessing the entrepreneurships and selecting those who seemed to be fit for the study, the contact information of these entrepreneurships was retrieved through publicly accessible sources and the entrepreneurships were invited to participate in the study. All participative entrepreneurships are anonymized in order to protect their privacy and avoid any competitive conflict. The business name is therefore replaced with a 5-digit ID tag, used as coding to identify the different entrepreneurial teams in an anonymous way.

The data is collected through several methods, as shall be described in detail in the subsequent subchapters. Both qualitative and quantitative data is retrieved. The development of the methodology is closely knit with the literature review, as Figure 12 shows, as the way of measuring team dynamics, innovation capability and startup firm performance are all none-conform in literature and demanded a specialized, unique approach.

For the data collection via survey, Select Survey was used to develop the online survey, which was then distributed via e-mail. The data analysis was performed using simple calculations in Excel and more advanced statistical analysis in SPSS. An evaluation of the entrepreneurial team’s maturity level is proposed, as well as a construct of the team’s innovation capability



and an evaluation of the firm performance of the entrepreneurship. The relationship between these three variables are analyzed in detail, as presented in chapter 5. Discussion. Furthermore, the three subgroups in the sample population of entrepreneurships were compared. The case study is examined in further detail as a special example.

### 3.1 Methodological Fit

It is vital to consciously adapt the methodology of the study correctly to the topic which is to be examined (Rayner, 2011). This seems rather intuitive, yet nevertheless Edmondson and McManus (2007) argue that there has been surprisingly little focus on this matter in management research. Even as early as in the 80s Venkatraman (1989) brought attention to the all too typical mismatch of theory and practice in field research, and thoroughly explained the many different elements of fit to consider. For instance, a typical weakness he identified was that far too often, a method was applied without thoroughly assessing the validity of the method for the specific concept that was to be studied (Venkatraman, 1989). Even so, failure of applying research methods that has appropriate fit considering previous work and the topic of interest is still a challenge in modern research, despite an established theoretical understanding of methodological fit. Such a negligence of fit should arguably weaken the validity of the research (Yin, 2014), and should thus be avoided.

Without diving too deep into the matter, there are some basic guide lines that can easily be followed that seems adequately thorough for a Master's thesis study. For studies that span scientific fields that are well established with a sound literary base, quantitative studies offer the best methodological fit (Edmondson & McManus, 2007). On the other hand, if the scientific field is nascent and yet to accumulate solid theories and a well-reviewed literary base, qualitative methods normally offers a better fit (Edmondson & McManus, 2007).

This thesis covers certain scientific fields that are well-established, such as for example team theory in general (Durand, Castillo, & Stewart, 1999; Levi, 2001; McGrath et al., 2000). However, it also covers scientific fields that are less established, such as for example team maturity as a topic in specific, or entrepreneurship team theory (Audretsch, 2012; Bhupatiraju, Nomaler, Triulzi, & Verspagen, 2012; Franco & Haase, 2013; Kotey, 2007). Furthermore, innovation theory is also applied, which can be said to be both nascent and well-established, depending on how you see it: Innovation theory dates only a few decades as an independent scientific field of its own (Bhupatiraju et al., 2012; Castellacci et al., 2005), and innovation capability in specific is still an emerging field. Simultaneously, its central elements build upon many of the same foundations of team theory and other well-established scientific fields (Fagerberg, 2006a, 2006b; Fagerberg & Verspagen, 2009).

Therefore, a combination of both quantitative and qualitative methods - a multi-methods research (Bryman, 2012) - seems to ensure the best fit for the field research, and will therefore be applied as explained more detailed below.

## 3.2 Literature Review

A literature review was performed for developing the theoretical foundation for this thesis. A thorough literature review of prior, relevant papers is the very foundation for theoretical progress, and is an essential part of any academic project (Webster & Watson, 2002). The focus of the literature review has been team maturity, innovation capability and firm performance, as this is considered the most relevant literature for the research problems of the study. Oria (via NTNUs library access) and Google Scholar were applied as search engines. It has been searched across different journals, as to not only rely on papers published in one single journal which can weaken the quality of the literature review (Webster & Watson, 2002).

Moreover, the literature review was in part based on an extensive literature review performed by the author in 2016 (Noergaard, 2016), which covered a wide span of team, entrepreneurship and innovation theory. A sort of snowball effect has been at play, leading the author from paper to paper on relevant topics (Ogura & Wang, 1996).

The theoretical foundation also affected the methodology of this study, as previous methodology of comparable studies has been examined and accounted for in the development of the methodology of this specific study.

### 3.2.1 Team Maturity

Team theory is a vast and well established scientific field (McGrath et al., 2000). A search on google scholar for peer reviewed papers on “Team” generates a massive hit of 4 780 000 results, and the search word “team dynamics” yields 29 400 papers. Team maturity is a less voluminous section of team theory, yielding “only” 677 results on the search term “team maturity”. Therefore, although a vast selection of team theory papers (>30) may form the foundation for the preparative work for this study, it has been chosen to follow a particular theory concerning team maturity. This theory is spin-theory, and the SPGR method is derived from it (Sjøvold, 2006a, 2014; Endre Sjøvold & Park, 2007)



### 3.2.2 Innovation Capability

A vast literature review on innovation theory was performed in preparation of this study (Noergaard, 2016). Innovation theory is becoming an extensive field of immense interest



(Audretsch, 2012). As a central subtopic of innovation, innovation capability has quite the afflux in papers, although it remains an area with limited established understanding. A search on Google Scholar for peer reviewed papers yields 3 620 000 results on “innovation”, and 38 500 results on “innovation capability”. Approximately 30 papers were assessed as highly relevant for the context of the study, and were applied for establishing the theoretical foundation for innovation capability in this study.

### 3.2.3 Firm Performance



Firm performance is an established field in finance, although it is not nearly as voluminous as team or innovation theory. However, there is a variance in methods applied in management research. Thus, both financial and operational indicators were assessed in the literature review, and the 13 final papers forming the theoretical backdrop for firm performance were carefully selected for the specific context of the study. A search on “firm performance” on Google Scholar yields 715 000 peer-reviewed papers. The search terms “firm performance” AND “entrepreneurship” yields 1 280 results. This number might seem large enough compared to team maturity literature, however it is a relatively small amount of literature compared to general sizes.

## 3.3 Qualitative Analysis

For the qualitative data gathering, a total of thirteen interviews were performed. They were mostly semi-structured (Barriball & While, 1994), or unstructured interviews (Moeller, Mescher, More, & Shafer, 1980). This was chosen for allowing unexpected elements to arise during the interviews (Yin, 2014). This is a way of minimizing the effect of biases (Moeller et al., 1980), which makes it a good element to combine with the more formalized and bias-prone quantitative data (Bryman, 2012).

As all interviewees but one were Norwegian native speakers, interviews were performed in Norwegian. The one interview with a non-Norwegian native speaker was performed part in Norwegian, part in English. A list of the interviews is enclosed in Appendix 7.

### 3.3.1 Semi-structured Interviews

In an early stage of the work on this thesis, an interview with Ph.D. Candidate and innovation specialist Joseph Schultz at NTNU was performed. The interview was semi-structured, focused around the development of the survey questions that is enclosed in Appendix 2. Furthermore, the methodology of innovation studies was discussed. The interview setting was face-to-face.

The non-formalized framing allowed for many useful inputs on the topic which were taken into consideration for the development of the methodology of this study.

Furthermore, also quite early in the work on the thesis, semi-structured interviews with two representatives of the case study entrepreneurship were performed. Partly, this served as a means of gaining detailed data on the case study. And partly, it served as a way of gaining insight in matters that would be of extra interest to study in the rest of the entrepreneurships included in the study.

For a balanced information source that minimizes biased or inadequate data and correct variance due to sampling error (Hedges, 1989), both viewpoints of business and technical side were included: One employee central in the technical side of the core product development, and one employee in the business side of this were interviewed. The combination of data collection through both individual interviews and a survey is found to increase the quality of the data and the researcher's understanding of the data (Andrews, Nonnecke, & Preece, 2003).

The technical employee was interviewed via telephone and the business employee was interviewed in a face-to-face setting. This is not considered to affect the data (Carr & Worth, 2001). The same interview guide was followed in both interviews, which ensures validity (Carmines & Zeller, 1979). See Appendix 1 for the original version of the interview guide.

### *3.3.2 Unstructured Interviews*

In addition to the semi-structured interviews, several unstructured interviews were performed. Two of the interviews were with employees in two different, yet both well-performing entrepreneurships who are not part of the survey. The entrepreneurships are both Norwegian, however differently located and operating in different businesses. Both of these interviews were performed in connection with the development of the methodology of this study. Furthermore, one of these interviewees were later on contacted again for an informal follow-up interview to brainstorm around the analysis and interpretation of the data. As Creswell and Miller (2000) state, these types of interviews can be useful for ensuring external validity. As the topic of the study is diffuse and non-conform in literature, such a way of "proofing" the methods and causal analysis of the study can help in discovering erroneous or biased conclusions (Moeller et al., 1980).

All three interviews were performed via telephone due to geographical distances. As many studied have found, telephone interviews are considered an equivalent data gathering method as face-to-face interviews (Carr & Worth, 2001; Greenfield, Midanik, & Rogers, 2000). This is deemed as applicable also in the setting of this study, and for these interviews in specific, especially as they were of an objective and non-sensitive nature. Meaning, the interview data from these interviews is assumed valid regardless of interview situation is face-to-face or not.

Secondly, another interview was performed with one of the founders and professors of an entrepreneurial university program. The interview was face-to-face and focused on the potential effects of the program on innovation capability and team dynamics. The interviewee offered valuable insight in the content and structure of such a program.

Thirdly, additional communication with several of the entrepreneurships in the sample population was done. In all, seven such interviews were performed via e-mail (4 entrepreneurships) and phone calls (3 entrepreneurships). Additional comments to and explanations of the survey answers were the topic, as well as allowing for additional information on the business of the entrepreneurship in question. This type of communication may be helpful in spotting erroneous data and in understanding the context of the data better, which may strengthen the analysis of the study (Zaller & Feldman, 1992).

### *3.3.3 Additional Input from Entrepreneurships*

Another way of allowing for external input on the data collection method was obtained through offering the survey respondents to comment in a comment box if they wished to do so. Although it has previously been claimed that all open-ended questions in a survey open for biased data (Shapiro, 1970), in this way of application it is deemed as a way to allow for useful input and insight. Through this comment box, a qualitative addition can be made to the quantitative survey data. Again, this is a method that may be helpful in spotting erroneous data and in understanding the context of the data better (Zaller & Feldman, 1992).

## 3.4 Quantitative Analysis

In this subchapter, an explanation of the research design regarding quantitative data is presented. The methodology for measuring each of the variables team maturity, innovation capability, and firm performance is thoroughly described.

### *3.4.1 Survey Development*

A survey was selected as the main tool to collect quantitative data. This was chosen partly as one can reach a larger population more easily with an online survey than through for example calling around asking for interviews (Andrews et al., 2003). The survey also ensures that the data is collected under the exact same conditions every time, minimizing the risk of interference from the researcher (Carmines & Zeller, 1979).

The data collection through the survey was comprehensive, i.e. the survey collected data on all three main focus areas of the study: Team maturity, innovation capability and firm performance. As all respondents were Norwegian native speakers, the language used in the

survey was Norwegian. See Appendix 2 for the original version of the survey. Although comprehensive, the survey was churned down to a concise version, as it is proven that shorter questionnaires will obtain a higher response rate (Galesic & Bosnjak, 2009).

A 1-7 Likert scale was applied for the answer alternatives, as this is a well-established scale for gathering accurate answers (Bryman, 2012; Gliem & Gliem, 2003; Matell & Jacoby, 1971). Such a scale minimizes subjectivity through offering mutually exclusive yet collectively exhaustive answer options (Yang, Dale, & Siow, 2001).

*3.4.2 Survey Diffusion and Response Rate*

The survey was sent out to a total of 320 entrepreneurship, and received 151 responses which yields a response rate of 47.2%. This is satisfactory, as it is often challenging to achieve high answer percentages on online surveys (Andrews et al., 2003; Reinisch, Daniel, & Li, 2016). However, only 95 of the answers were complete, yielding a true response rate of 29.7%. This is still deemed satisfactory, as online surveys characteristically have low response rates, typically around 10%-25% (Sauermann & Roach, 2013). All item nonresponse, wave nonresponse, and attrition cases were then accounted for (Graham, 2012). After cleaning the data, 61 answers were found to be complete and viable for analysis, leaving us with an adequate final viable response rate of 19.1%.

Table 6 portrays the division of the valid replicants in the data set that was analyzed.

*Table 6 - Final Answer Percentages Per Data Subgroup*

<b>Group</b>	<b>N</b>	<b>n</b>	<b>Answer percentage</b>
1	20	16	80.0%
2	16	6	37.5%
3	284	39	13.7%
<i>Total</i>	320	61	19.1%

As Table 6 shows, the response rate is much higher for group 1, and significantly higher for group 2, than for group 3. This is likely because both calling and e-mailing was used as method of contact for group 1. For group 2 and 3, only e-mail (or online contact forms) was used as mode of contact. Furthermore, a round of reminders was sent out to the entrepreneurship in group 1 and 2 that had not answered after one week after first touch. This extra follow-up and multiple contact channels is likely to explain much of the difference in answer percentages (Andrews et al., 2003).

## 3.5 Primary and Secondary Data Sources

This study applies mostly primary data, i.e. data that is given directly from the source that the data describes (Bryman, 2012; Yin, 2014). This comprises both quantitative and qualitative data, for example the data collected through the interviews and the survey. However, most of the primary data is quantitative.

Secondary data is data conveyed through an intermediate source, i.e. is not delivered directly from the source it describes (Bryman, 2012; Yin, 2014). The secondary data of this study is purely quantitative, and applied as a support to the firm performance data that was collected as primary data.

As mentioned in the theory chapter 2.3 Firm Performance, it can be challenging to access financial indicators such as those that are used for measuring firm performance in this study. However, via combining primary data from the survey with secondary data from the website proff.no, the access to these indicators was increased. It has been found that combining both primary and secondary data in measuring entrepreneurship performance can help counteract missing data in either source (Murphy et al., 1996).

## 3.6 Reliability

Reliability is the degree to which a study can be reproduced by applying the same methodology. Thus, a high reliability will entail that results are consistent over time (Golafshani, 2003). Through the detailed presentation of the theoretical foundation (ch. 2) and the methodology of this paper (ch. 3), the general reliability of the paper is enhanced by making it possible for anyone to replicate the study. Thus, they should be able to derive the same findings and conclusions as have been made in the study.

Furthermore, the reliability of this study is deemed satisfactory, through applying the test-retest, internal consistency tests and triangulation method, as described in detail in the two subsequent subchapters.

### *3.6.1 Reliability of Quantitative Methods*

There exist several types of tests for reliability in quantitative studies. In this study, two tests are applied: the test-retest method and the internal consistency reliability method.

The test-retest method is used to measure the consistency of a method from one time to another (Weir, 2005). In this study, there is performed a test-retest for team maturity of entrepreneurial teams in group 1. In the test, there was sufficient consistency between the

two test results. The correlation of the two test results were satisfactory at 0.5, given that some development is expected between the two times of measurement. In average, there was a low difference in team maturity (0.22), and all teams had minor, expected changes in team maturity.

The internal consistency reliability method is used to assess the consistency of items across a test. Cronbach's alpha is the most common method for testing internal consistency (Henson, 2001; Osburn, 2000). The Cronbach's alpha of innovation capability in the study is calculated to 0.8, which implies good internal consistency. The Cronbach's alpha for firm performance is 0.7, which is equals an adequate internal consistency.

Thus, the test-retest and internal consistency reliability test methods both indicate that the study has satisfactory reliability.

### *3.6.2 Reliability of Qualitative Methods*

Another way of checking for reliability in a study, is through triangulation. Several studies have found that triangulation through applying several methods and data sources is a good way to ensure reliability, especially for qualitative data (Golafshani, 2003; Mathison, 1988; Thurmond, 2001).

Different methods and data sources (e.g. interviews, survey) are applied for the qualitative data. Thus, it can be argued that through the triangulation of methods and data sources in this study, the reliability of the qualitative elements is satisfactory.

## 3.7 Validity

Validity is the extent to which a measurement, concept or conclusion is accurate and applies to the real-world phenomenon it is meant to describe. There exists many perspectives and terms for assessing validity in modern research (Creswell & Miller, 2000).

Two perspectives on validity has been chosen to address for this study, experimental validity and test validity. Two main types of experimental validity are internal and external validity (Onwuegbuzie, 2000). Furthermore, there are three main types of test validity: Criterion, construct and content validity (Carmines & Zeller, 1979). Experimental and test validity is typically applied in quantitative studies.

Moreover, assessing the lens of the researcher can help to evaluate the validity of the qualitative data of the study (Creswell & Miller, 2000). This type of validation check has been performed via peer debriefing (Creswell & Miller, 2000), see the description of the interviews in ch. 3.3.



### *3.7.1 Internal Validity*

Internal validity is the degree to which the results are attributable to only manipulation of the independent variable on a dependent variable, and not to some other explanation (Onwuegbuzie, 2000). Meaning, the conclusions on causality has satisfactory validity if the context of the study does not affect causal relationships (Creswell & Miller, 2000).

Admittedly, as the scientific fields covered by the study is non-conform on methodology and definition, there is a certain element of possible interference from sub-optimality in research design. Nevertheless, as far as the author can assess, the internal validity of this study is warranted by the research design, measures used and research setting. For instance, the context of entrepreneurship and the potential effects from this context on the dependent variables has been carefully considered throughout the research process of the study.

### *3.7.2 External Validity*

External validity is the extent to which the results can be generalized (Onwuegbuzie, 2000). The findings of the study should be generalizable for all other entrepreneurships that are similar to the subjects in the study. Moreover, although the study is performed on Norwegian entrepreneurial teams, it is believed that the findings of this study is applicable for entrepreneurships of other nationalities and cultural settings as well.

Furthermore, it can be said that an entrepreneurial team is much like any other innovative team: Ancona and Bresman (2006) state that an innovative team creating innovations within an organization is in fact much like an independent, small entrepreneurial venture. Thus, the findings of this study can, when applied with care, be generalizable for innovative teams overall.

### *3.7.3 Criterion Validity*

Criterion validity can be further divided in predictive validity and concurrent validity (Cronbach & Meehl, 1955). By obtaining a criterion after the test for it has been performed, we speak of predictive validity. If test score and criterion score is performed at approximately the same time, it is a concurrent validity (Cronbach & Meehl, 1955).

This study does not study effects after an influence is applied on the test subject, it is not heavily criterion-oriented and thus this concept will not be elaborated further.

### *3.7.4 Construct Validity*

Construct validity applies for studies where the study's data sample is a measure of a property which is not operationally defined (Cronbach & Meehl, 1955). It applies for factors that cannot be measured in full by one, single indicator (Cronbach & Meehl, 1955). This applies in large

degree for this study, as team maturity, innovation capability, and firm performance are all not operationally defined constructs.

As explained, several theoretical perspectives and indicators have been applied for innovation capability and firm performance construct, as a means of increasing the robustness of the constructs (Vicente et al., 2015). For team maturity, the established method and construct of SPGR has been applied, for which hypothetic development from pretest was recognized in posttest in 80% of teams in identical context and time (N=311 groups) (E Sjøvold, 2002). Validity and reliability of the previous, similar studies applying the SPGR-method is assessed as adequate (E Sjøvold, 2002) which will translate to this study as well.

### 3.7.5 Content Validity

Content validity applies when the test items are all part of the same domain that interests the investigator (Cronbach & Meehl, 1955). In this study, construct validity is observed by keeping strictly within the relevant theoretical domains for the three main fields of data. I.e. for team maturity, this specific domain witching team theory has been applied, for innovation capability, theory of this domain was extracted from innovation theory etc.

Furthermore, all theory concerning each of the three domains have been carefully assessed for being applicable for the context of the study. In specific, the fit for Norwegian entrepreneurships and entrepreneurial teams was considered.

## 3.8 How to assess Team Maturity using SPGR Data



Based on Spin-theory, SPGR has been used as a method to evaluate the team dynamics of the entrepreneurial teams that comprise the dataset. Note that although the methodology for this is based on Spin-theory, the practical way of employment for team maturity in specific is developed by the author of this thesis. The aim was to be able to assess the maturity level of the team, in order to study the implications of different team maturity levels on innovative capability and firm performance.

In order to do this, SPGR bases itself on four basic group functions (nurture, dependence, opposition and control), which is incorporated in four dimensions (C-N, O-D, W-S, and I-P) (Sjøvold, 2006b, 2007). This is explained in further detail in the theoretical framework, chapter 2.1. Team Maturity in Entrepreneurial Teams. In the methodology developed in this study, the C-N (control-nurture), O-D (opposition-dependence) and W-S (withdrawal-synergy) dimensions are considered.

### 3.8.1 The SPGR-Method

The SPGR raw data was collected via the survey. The team representative would rate his or her team with regards to 24 sets of behavioral aspects, answering for whether the behavioral aspects occurred seldom, sometimes or often in the team, see Table 7.

Table 7 - SPGR Tool for Measuring Team Dynamics

<b>Behavioral aspect</b>	<b>Seldom</b>	<b>Sometimes</b>	<b>Often</b>
1 Involved, goal-oriented, constructive in collaboration			
2 Principled, detail oriented, assertive			
3 Noncommittal, impulsive, attention-seeking			
4 Sociable, compassionate, adaptable			
5 Withdrawn, obstinate, indifferent			
6 Hard working, obedient, loyal			
7 Caring, supportive, encouraging			
8 Efficient, confident, dears to lead			
9 Closed off, self-driven, prefers working solo			
10 Anxious, tense, self-doubt			
11 Self-sacrificing, self-pitying, complaining			
12 Informal, considerate, sees all as equal			
13 Cooperative, supportive, approving			
14 Direct, controlling, demanding			
15 Self-centered, provocative, intractable			
16 Selfless, trusting, thinks well of others			
17 Disheartened, discouraged, apathetic			
18 Careful, reliable, takes on tasks			
19 Extrovert, open, acknowledging			
20 Analytical, factual, rational			
21 Intrusive, tough, competitive			
22 Emotional, unpredictable, untraditional			
23 Reserved, rejecting, withdrawn			
24 Faithful, friendly, respectful			

Based on these answers, the SPGR-algorithm was applied to calculate the scores of the team on the C-N, O-D and W-S dimensions, measured in two vectors for each dimension, i.e. C1 and C2, N1 and N2, O1 and O2, D1 and D2, W1 and W2, and S1 and S2. See Table 8 for explanation of what the 12 vectors each entails in typical behavioral aspects.

Table 8 - SPGR 12 Team Dynamics Vectors

**SPGR 12 vectors**

Vector	Typical behavior
<i>S1 Engagement</i>	Energetic, inviting others to contribute
<i>S2 Empathy</i>	Supportive, showing interest for others
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful
<i>D2 Acceptance</i>	Cautious, show acceptance of the group
<i>O1 Criticism</i>	Critical, opposing
<i>O2 Assertiveness</i>	Assertive, self-promoting
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute
<i>N1 Caring</i>	Taking care of others, attentive to relations
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming

Based on these 12 vectors, one may assess certain elements of the team’s dynamics. As explained by Sjøvold (2006a, 2006b, 2007, 2014), the team maturity depends on the balance of the basic group functions in the team. Here the method developed by the author specifically for this study comes into play.

*3.8.2 Method for Evaluating Team Maturity from SPGR-Data*

The methodology developed by the author for assessing the team maturity level of the entrepreneurial teams of the study took basis in SPGR-Data, and applied theory-based assessments from which a construct for team maturity was calculated. All entrepreneurial teams were assessed individually.

Furthermore, there are three subgroups in the study’s case sample population. All three groups have been assessed with regard to their current team maturity. Additionally, one subgroup of the population (Group 1) have been assessed also with regards to their team maturity some years back in time.

As we see in Appendix 4, the 12 vectors N1, N2 etc. to S2 has been quantified to range from 0.00 to 4.00 in value. As explained in Spin-theory by Sjøvold (2006a, 2007, 2014), the more balance there is between the dimensions N-C and O-D, the higher the maturity level. Furthermore, the closer to the S- end of the W-S dimensions, the higher the maturity level of the team. These are the most basic elements that we base our analysis on.

Tables 9, 10 and 11 portrays how this theoretical insight is quantified for ease of analysis. First, the four levels of team maturity as explained in chapter 2.2 team dynamics are quantified in

a range from 1 to 4. The team maturity construct is constructed to range from 1 to 4, so that it then mirrors the for levels of team maturity in Spin-theory, as displayed in Table 9:

*Table 9- Team Maturity Levels*

<b>Maturity Level</b>	<b>Team maturity coding</b>
<i>Reservation</i>	1
<i>Team spirit</i>	2
<i>Production</i>	3
<i>Innovation</i>	4

Then, the four dimensions are assessed according to the four maturity levels (Table 10).

*Table 10 - Analysis Method for Team Maturity Assessment: Balance*

<b>Dimension</b>	<b>Difference x (rounded off)</b>	<b>Maturity level</b>
<i>N1-C1</i>	$x \geq 3$	1
	$3 > x \geq 1.5$	2
	$1.5 > x \geq 1$	3
	$x < 1$	4
<i>N2-C2</i>	$x \geq 3$	1
	$3 > x \geq 1.5$	2
	$1.5 > x \geq 1$	3
	$x < 1$	4
<i>O1-D1</i>	$x \geq 3$	1
	$3 > x \geq 1.5$	2
	$1.5 > x \geq 1$	3
	$x < 1$	4
<i>O2-D2</i>	$x \geq 3$	1
	$3 > x \geq 1.5$	2
	$1.5 > x \geq 1$	3
	$x < 1$	4

Next, the four scales W1 to S2 are assessed (Table 11).

Table 11 - Analysis Method for Team Maturity Assessment: Withdrawal versus Synergy

Vector	Value x (rounded off)	Maturity level
W1	$x \leq 1$	4
	$1 < x \leq 2$	3
	$2 < x \leq 3$	2
	$3 < x \leq 4$	1
W2	$x \leq 1$	4
	$1 < x \leq 2$	3
	$2 < x \leq 3$	2
	$3 < x \leq 4$	1
S1	$x \leq 1$	1
	$1 < x \leq 2$	2
	$2 < x \leq 3$	3
	$3 < x \leq 4$	4
S2	$x \leq 1$	1
	$1 < x \leq 2$	2
	$2 < x \leq 3$	3
	$3 < x \leq 4$	4

Finally, the average of the assessment scores is calculated, which equals the final construct value. The final construct value gives an indication of the entrepreneurial team's team maturity. See ch. 4.2 for the empirical findings on team maturity.

### 3.9 How to Assess Innovation Capability in Entrepreneurships



In this study, a construct is made by the author for measuring innovation capability. Theoretical chapter 2.2. Innovation Capability portrays the details of the theoretical foundation for the development of this construct. Referring to the first four of the five innovation capability perspectives covered in theoretical chapter 2.2 (See Table 3), the following four variables were constructed: Innovation in product/service versus organization or process (InnoProdProc), (facilitating) innovation through competence and strategy (InnoCompStrat), innovation by HR (InnoHR), and innovation through leadership and processes (InnoLeadProc). Appendix 2 portrays which of the survey questions are embedded into which of these four variables. Table 12 below summarizes the connection between the construct variables, the theoretical perspectives, and the survey questions.

Note that theoretical perspective V, on teamwork for innovation, is exempted from the innovation construct. This is a conscious choice, made so that it is possible to study the effect of this perspective independently. The basis for this choice is that team maturity is another

variable that shall be compared to innovation capability, and the team-perspective is then interesting to keep aside for flexibility of ways of analysis. See ch. 4.2.4 working with Innovations in Teams for empirical findings on this perspective. See Table 12 for a visual representation of the link between the four theoretical perspectives I-IV and the innovation capability construct variable.

Table 12 - Innovation Capability Construct

<b>Construct</b>	<b>Innovation Variable</b>	<b>Theoretical Perspective<sup>1</sup></b>	<b>Survey Question<sup>2</sup></b>
<i>Innovation Capability</i>	InnoProdProc	I Product and service innovation versus organization and process innovation	2,3
	InnoCompStrat	II Innovation facilitated by competence and strategic focus on innovation	4,5,6,7
	InnoHR	III Innovation originating from human capital	8,9,10
	InnoLeadProc	IV Management and processes that facilitate for innovation	11,12,13,14,15

1. See chapter 2.2 for detailed explanation of the theoretical perspectives.
2. See Appendix 2 for detailed description of the survey questions.

These four innovation variables, or sub-constructs, together form the main construct that is developed as a method to measure innovation capability in a holistic way. The innovation capability level has been quantified to range from 0 to 7, as portrayed by Table 13. See Appendix 9 for innovation capability raw data.

Table 13 - Innovation Capability Levels

<b>Innovation Capability level</b>	<b>Score</b>
Poor	0-1
Moderate	2-3
Good	4
Very Good	5-6
Extremely good	7

The Innovation capability level is assessed for each of the four innovation variables. Then, the average of the four is calculated, which yields the overall innovation capability. See ch. 4.3 for the empirical findings on innovation capability.

### 3.10 How to assess Firm Performance of Entrepreneurships



This section is quite deliberately named (...) firm performance for *Entrepreneurships* as it has been found that measuring firm performance in entrepreneurships is very different from measuring firm performance in well established, more traditional firms! Literature has warned us of this, yet reality was even more challenging than expected. Entrepreneurships simply cannot be measured by financial ratios without an assessment and good dose of logical reasoning, as their situation is quite different than that of traditional firms.

For instance, in an early phase of the business, cash-flows may very well be non-existent as production and sales simply have not begun yet. This affects profitability, liquidity and growth in sales. Equally, web-based and other service business does not always necessitate taking on debt, which affects both solidity and liquidity. As one Marketing Director (59592) said: “It is hard for us to put down these numbers, as we have not been in ordinary mode of operation for a year yet.”

Or as a CEO of another firm (58831) put it: “Most Startups have little sales the first few years. The last questions (ed.: questions on firm performance) are therefore difficult to answer.”

Many put it in similar ways to this statement: “The company has no turnover, and no short-term debt. We also had a negative result last year” (CEO, 58539).

Thus, we have to develop a comprehensive method to make any viable assessments of how well these entrepreneurships are actually performing. First, we combine both primary and secondary data, as described in chapter 3.4.2 Primary and secondary data sources. In this way, it is possible to retrieve enough information in most of the cases in order to get a satisfactory sample of respondents where one can assess firm performance with reasonable validity. Appendix 8: Firm performance data shows the raw data that was applied to calculate the firm performance of the entrepreneurships that are included in the sample population.

Firm performance is calculated as a construct, made up by the assessment of four underlying financial ratios that measure firm performance; liquidity, profitability, solidity, and sales growth (Table 14). Formulas for the ratios can be found in ch. 2.3 Firm performance (Formula 1.1, 1.2, 1.3 and 1.4).



Table 14 - Firm Performance Construct

<b>Construct</b>	<b>Innovation Variable</b>	<b>Theoretical Perspective</b>	<b>Survey Question</b>
<i>Firm Performance</i>	Liquidity (1.1)	The ability to meet short term financial obligations	18
	Profitability (1.2)	Economic gain on the business, ability to accumulate gains	19
	Solidity (1.3)	The ability to withstand economic losses and fulfill financial obligations in the long term	20
	Sales growth (1.4)	A measure of the increase in business activity	21

Firm performance is coded into 5 levels, as portrayed by Table 15.

Table 15 - Firm Performance Levels

<b>Firm Performance level</b>	<b>Code</b>
<i>Poor</i>	0
<i>Moderate</i>	1
<i>Satisfactory</i>	2
<i>Good</i>	3
<i>Very good</i>	4

The assessment of the four ratios are based on the following convergence tables (Table 16 and 17):

Table 16 - Financial Ratio Assessment Convergence Table: Liquidity

<b>Financial Ratio value</b>	<b>Firm performance assessment</b>
$0 < x \leq 0,5$	Poor
$0,5 < x \leq 1$	Moderate
$1 < x \leq 2$	Satisfactory
$2 < x \leq 5$	Good
$x > 5$	Very good

Table 17 - Financial Ratio Assessment Convergence Table: Profitability, Solidity, Sales Growth

<b>Financial Ratio value</b>	<b>Firm Performance assessment</b>
$x \leq 0$	Poor
$0 < x \leq 5$	Moderate
$5 < x \leq 10$	Satisfactory
$10 < x \leq 50$	Good
$x > 50$	Very good

Finally, after assessing the firm performance of each of the four ratios, the average of the four ratios was calculated, which equals the total firm performance. The empirical findings for firm performance can be found in ch. 4.4 Firm Performance.

## 4. Empirical findings

In this chapter, the empirical findings are presented. The methodology behind the data is presented in ch. 3, and the theoretical foundation for the methodology is presented in ch. 2.

### 4.1 Affiliation to UEM and Area of Operation

In the following, some basic features of the data set that will be interesting for further analysis will be presented. This will help us understand the teams that we are analyzing better, and might reveal underlying factors that affect our three main variables; team dynamics, innovation capability, and firm performance.

Recall that we have three subgroups in our data set:

- Group 1: Entrepreneurial teams that are issued from an entrepreneurship Master's University program, and that include longitudinal research data on team dynamics (SPGR data).
- Group 2: Entrepreneurial teams that are issued from an entrepreneurship Master's University program, that only have current team dynamics data.
- Group 3: Entrepreneurial teams that have no affiliation to University Entrepreneurship Master's programs and that only have current team dynamics data.

Table 18 shows how the 61 entrepreneurial teams that are examined are represented in the three groups. As you find, group 3 is clearly the largest one at 63.9% of N=61 respondents.

Table 18 - Number of Respondents per Data Subgroup

<b>Group</b>	<b>n</b>	<b>Percentage of total N</b>
1	16	26.2%
2	6	9.8%
3	39	63.9%

Among the 61 entrepreneurship, 22 were mainly operating in products, 26 in services, and 13 in a combination of both areas of operation. Table 19 displays the relative percentages.

Table 19 - Distribution of Area of Operation

	<b>N</b>	<b>Percent</b>
<i>Product</i>	22	36.1%
<i>Service</i>	26	42.6%
<i>Product and Service</i>	13	21.3%
<i>Total</i>	61	100%

As one can see, service is the dominating area of operation, although all three categories seems fairly well represented in the data set. Combining both group membership and area of operation, yields the following overview (Table 20).

Table 20 - Cross table: Area of Operation versus Group Membership

<b>Group No.</b>	<b>Product</b>		<b>Service</b>		<b>Product and Service</b>		<b>Total</b>	
	n	% of Product	n	% of Service	n	% of P and S	n	% of N
1	9	40.9%	5	19.2%	2	15.4%	16	26.2%
% of 1	56.3%	14.8%*	31.3%	8.2%*	12.5%	3.3%*		
2	3	13.6%	1	3.8%	2	15.4%	6	9.8%
% of 2	50.0%	4.9%*	16.7%	1.6%*	33.3%	3.3%*		
3	10	45.5%	20	76.9%	9	69.2%	39	63.9%
% of 3	25.6%	16.4%*	51.3%	42.6%*	23.1%	14.8%*		
<i>Total</i>	22	36.1%	26	42.6%	13	21.3%	61	100%

\* % of total (N = 61)

Group 3, service entrepreneurships (3S) are clearly dominating the data set by holding 42.6% of the respondents. Furthermore, 3P, 1P and 3PS are all larger categories with regards to the total population N=61. Note also that within the groups 1-3, group 1 is dominated by Product at 56.3% of the group's respondents. Similarly, group 2 is also dominated by Product, at 50.0% of its group's respondents. Group 3, however, is dominated by Service at 42.6%. Thereof, there seems to be an overrepresentation of Product as main area of operation among entrepreneurships which have an affiliation to university entrepreneurship program. Accordingly, for entrepreneurships without any connection to the university entrepreneurship program, there is an overweight of service companies.

## 4.2 Team Maturity Results



The data on team dynamics is based upon the SPGR method as explained in chapter 3.4.3. Team Dynamics: SPGR data. In the following, we will analyze the data, aiming to assess the team maturity of each entrepreneurial team. For a thorough description of the method, see chapter 3.8 How to Assess Team Maturity.

Appendix 3 portrays the raw data that was collected on team dynamics. Using the SPGR method (Sjøvold, 2002, 2006a, 2007, 2014), the raw data was processed into the 12 vectors (N1, N2, D1 etc. to S2). Appendix 4 portrays the processed 12 vector SPGR data, upon which we base our analysis of team maturity. Appendix 5 show the full N-C, OD, and W-S analysis for the comprehensive team maturity level assessment.

To thoroughly describe the methodology of team maturity assessment, a thorough example is shown in the case study (ch. 4.6.2). However, to avoid having page up and page down with tables, the results of the team maturity analysis is then summarized in Table 21.

The process described above was coded in excel and yielded the following results, as shown by Table 12. Team maturity level is noted M. Note that the table include data from the longitudinal study (Group 1), marked with a L at the end of the ID tag where it applies. The change in maturity level is calculated for the 16 teams that have been followed in the longitudinal study, and is marked  $\Delta M$ . The comprehensive data of the team maturity analysis can be found in Appendix 5.

Table 21 - Team Maturity Levels M

<i>ID tag</i>	<b>M</b>	<b>ΔM</b>	<i>ID tag</i>	<b>M</b>	<b>ΔM</b>	<i>ID tag</i>	<b>M</b>	<b>ΔM</b>
58106	3	NA	58588	3	NA	58907	3	NA
58147	3	0,375	58595	2	NA	58912	3	NA
58147L	3	0	58599	3	NA	58913	3	NA
58354	3	-0,25	58620	3	NA	58914	3	NA
58354L	3	0	58625	2	NA	58915	3	NA
58416	3	0,375	58682	3	NA	58926	3	NA
58416L	3	0	58694	3	NA	58931	3	NA
58091	3	0	58704	3	NA	58933	3	NA
58091L	3	0	58708	3	NA	58934	3	NA
58092	3	0	58725	3	NA	58938	3	NA
58092L	3	0	58732	2	NA	58941	2	NA
58099	3	0,25	58738	3	NA	58990	3	NA
58099L	3	0	58762	3	NA	59032	3	NA
58113	3	0,25	58785	2	NA	59085	3	NA
58113L	3	0	58811	3	NA	59101	3	NA
58115	3	0,25	58816	3	NA	59102	2	NA
58115L	3	0	58831	3	NA	59592	2	NA
58116	3	NA	58833	3	NA	58527L	3	0
58340	3	0,125	58851	3	NA	58539	3	0,375
58340L	3	0	58856	3	NA	58539L	3	0
58414	3	0,5	58885	3	NA	58842	2	0,625
58414L	3	0	58891	3	NA	58842L	3	1
58419	3	0,125	58895	3	NA	58844	3	0,25
58419L	3	0	58898	3	NA	58844L	3	0
58527	3	0,25	58904	3	NA	58848	3	0,125
						58848L	3	0

As is somewhat surprising, there is very little diversity in the results. Table 22 shows the dispersion of maturity levels, marked by a clear domination of level 3 – production. Level 2 – team spirit – makes a modest contribution.

Table 22 – Frequencies of Team Maturity Levels

<b>Maturity level M</b>	<b>n</b>	<b>% of N</b>	
M=1	0	0.00%	
M=2	8	10.5%	
M=3	68	89.5%	
M=4	0	0.00%	

Analyzing the three subgroups in our dataset shows no distinct differences between the three groups either, as Table 23 shows.

Table 23 - Average Group Team Maturity

<b>Group</b>	<b>Average M</b>		<b>Standard deviation</b>	
	<b>Old</b>	<b>Current</b>	<b>Old</b>	<b>Current</b>
1	2.95	2.73	0.1505	0.2337
2	NA	2.69	NA	0.1531
3	NA	2.73	NA	0.2755
<i>Whole sample population</i>	-	2.77	-	0.2520

All three groups have an average just below team maturity level 3 – production, and neither of them shows any distinctiveness from the other. This includes the old data from the longitudinal study covering the teams in Group 1.

Moreover, speaking of the teams in Group 1, the change in team maturity level was modest, yet most teams had a slight increase in team maturity between the points of time when they were measured with SPGR. Table 24 shows the changes in team maturity that were found.

Table 24 - Changes in Team Maturity over Time (Group 1)

<b>Change in M, <math>\Delta M</math></b>	<b>n</b>
$\Delta M = 0$	2
$0 < \Delta M \leq 1$	13
$0 > \Delta M \geq -1$	1
$1 < \Delta M \leq 2$	0
$-1 > \Delta M \geq -2$	0
$2 < \Delta M \leq 3$	0
$-2 > \Delta M \geq -3$	0
$3 < \Delta M \leq 4$	0
$-3 > \Delta M \geq -4$	0

Furthermore, correlation analyses against other elements that might have affected the results, such as area of operation (product/service/both) were run. No significant correlations were found.

### 4.3 Innovation Capability Results

In this chapter, the innovation capability of the entrepreneurial teams will be presented. See chapter 3.9 How to Assess Innovation Capability for a description of the methodology behind the findings in this chapter. Appendix 9 holds the table of the raw data that has been used for analyzing the innovation capability of each entrepreneurship.

#### 4.3.1 Innovation Capability

Mean analysis, bootstrapping and at a 95 percentile confidence interval level, yields the following results for the four innovation variables (Table 25).

Table 25 - Innovation Variable Means

<b>Innovation variable</b>	<b>Mean</b>	<b>Std. dev.</b>
<i>InnoProdProc</i>	5.69	0.9809
<i>InnoCompStrat</i>	5.51	0.9808
<i>InnoHR</i>	5.84	0.9680
<i>InnoLeadProc</i>	5.12	0.7926

As the table portrays, all four innovation variables are of high, and similar value. A bivariate correlation analysis, Pearson’s correlation coefficients and 95 percentile confidence interval confirmed that all variables have significant correlations, as portrayed by Table 26.

Table 26 – Correlations for Innovation Variables

	<b>InnoProdProc</b>	<b>InnoCompStrat</b>	<b>InnoHR</b>	<b>InnoLeadProc</b>
<i>InnoProdProc</i>	1	0.497*	0.497*	0.419*
<i>InnoCompStrat</i>	0.497*	1	0.390*	0.381*
<i>InnoHR</i>	0.497*	0.390*	1	0.657*
<i>InnoLeadProc</i>	0.419*	0.381*	0.657*	1

\*significance level at 0.005

Note the extra strong correlation between InnoHR and InnoLeadProc.

Calculating the average of the four innovation variables then forms our construct for measuring innovation capability, InnoCap. The innovation variables and the total innovation capability for all entrepreneurs is calculated, with a range from 0 (very poor) to 7 (extremely good). Table 27 summarizes the results.

*Table 27 - Innovation Capability*

<b>ID tag</b>	<b>InnoProdProc</b>	<b>InnoCompStrat</b>	<b>InnoHR</b>	<b>InnoLeadProc</b>	<b>InnoCap</b>
58106	6.00	5.00	5.67	4.00	5.17
58147	6.00	5.50	5.33	5.00	5.46
58354	5.50	5.50	6.00	5.40	5.6
58416	6.50	6.75	4.67	4.80	5.68
58091	4.50	5.25	4.67	3.80	4.55
58092	7.00	6.75	6.33	5.80	6.47
58099	6.00	6.00	5.67	5.20	5.72
58113	5.50	5.00	4.67	3.20	4.59
58115	6.50	6.25	6.33	5.40	6.12
58340	4.50	4.50	5.33	5.40	4.93
58414	6.50	6.00	6.33	5.00	5.96
58419	6.00	6.25	6.00	6.20	6.11
58527	6.00	5.75	6.33	5.20	5.82
58539	6.50	7.00	7.00	5.80	6.58
58842	5.00	5.25	6.33	5.20	5.45
58844	5.50	5.25	6.00	4.40	5.29
58848	6.50	5.50	6.67	5.60	6.07
58588	5.50	5.75	5.00	4.80	5.26
58595	6.50	6.00	6.00	6.40	6.23
58599	6.00	6.75	6.00	5.40	6.04
58620	6.50	5.75	7.00	6.00	6.31
58625	4.00	3.00	4.33	3.40	3.68
58682	5.50	6.00	6.00	5.02	5.45
58694	5.50	5.75	6.00	5.40	5.66
58704	5.50	6.50	7.00	5.00	6.00
58708	4.00	4.50	6.33	5.00	4.96
58725	6.00	5.50	6.00	4.40	5.48
58732	4.50	4.50	4.00	3.80	4.20
58738	6.00	5.25	6.67	5.60	5.88



58762	6.50	7.00	6.67	5.20	6.34
59592	5.00	5.75	4.33	4.00	5.86
58785	7.00	5.50	6.33	5.40	4.77
58811	5.00	2.25	6.00	5.00	6.06
58671	6.00	5.00	4.67	5.40	4.56
58831	6.00	5.02	5.33	5.00	5.27
58833	6.50	5.75	6.33	5.20	5.64
58851	5.50	6.25	6.33	5.60	5.95
58856	5.00	6.00	5.33	5.20	5.92
58885	4.50	5.00	5.67	4.60	5.38
58891	6.00	5.75	6.33	3.90	4.94
58895	6.50	6.50	6.33	4.40	5.42
58898	7.00	4.00	7.00	5.00	5.93
58904	6.50	5.00	7.00	5.60	5.75
58907	6.00	5.00	3.00	4.40	6.03
58912	5.50	5.50	7.00	6.20	4.60
58913	4.50	4.75	3.00	2.80	6.05
58914	5.50	6.50	6.33	6.40	3.76
58915	5.50	4.75	5.33	5.60	6.18
58926	6.50	6.00	6.33	5.20	5.30
58931	4.00	2.75	4.67	5.40	6.01
58933	1.50	5.00	4.67	4.40	4.20
58934	6.00	6.75	6.67	6.00	3.89
58938	6.50	5.75	7.00	6.00	6.35
58941	6.50	6.25	6.33	5.20	6.31
58990	5.50	5.00	5.00	5.20	6.07
58993	5.20	5.10	4.95	5.45	5.18
59009	6.50	6.25	6.33	6.80	5.50
59032	7.00	6.50	6.33	5.20	6.47
59085	6.00	4.50	6.33	5.00	6.26
59101	5.50	5.75	6.00	5.80	5.46
59102	5.00	6.25	7.00	5.20	5.76

Table 28 summarizes the frequencies of the innovation capability scores.

Table 28 - Innovation Capability Level Frequencies

<b>Innovation Capability Score</b>	<b>Frequency</b>	<b>Percent of sample population</b>
<i>Poor - ≤1</i>	0	0
<i>Moderate - 2</i>	0	0
<i>Moderate - 3</i>	0	0
<i>Good - 4</i>	6	9.84
<i>Very Good - 5</i>	20	32.8
<i>Very Good - 6</i>	34	55.7
<i>Extremely good - 7</i>	1	1.64

The mean for InnoCap is shown by Table 29, with regards to the whole sample population, and each of the three groups in the sample population.

Table 29 - Mean of Innovation Capability, Groups 1-3

<b>InnoCap</b>	<b>Mean</b>	<b>Std. dev.</b>
<i>Whole sample population</i>	5.52	0.7134
<i>Group 1</i>	5.65	0.5953
<i>Group 2</i>	5.43	0.5949
<i>Group 3</i>	5.51	0.8037

As the table above shows, the average innovation capability is high for the sample population as whole. Moreover, there is little difference between the three groups.

#### 4.3.2 Innovation and Teamwork

Next, the results of perspective V Innovation and Teamwork, measured by innovation variable InnoTeam, is presented. In general, the entrepreneurs report a high overall focus on using the team as a setting for innovation. The chart below (Figure 13) show the responses on question 12 – whether the entrepreneurship work on innovation in teams.

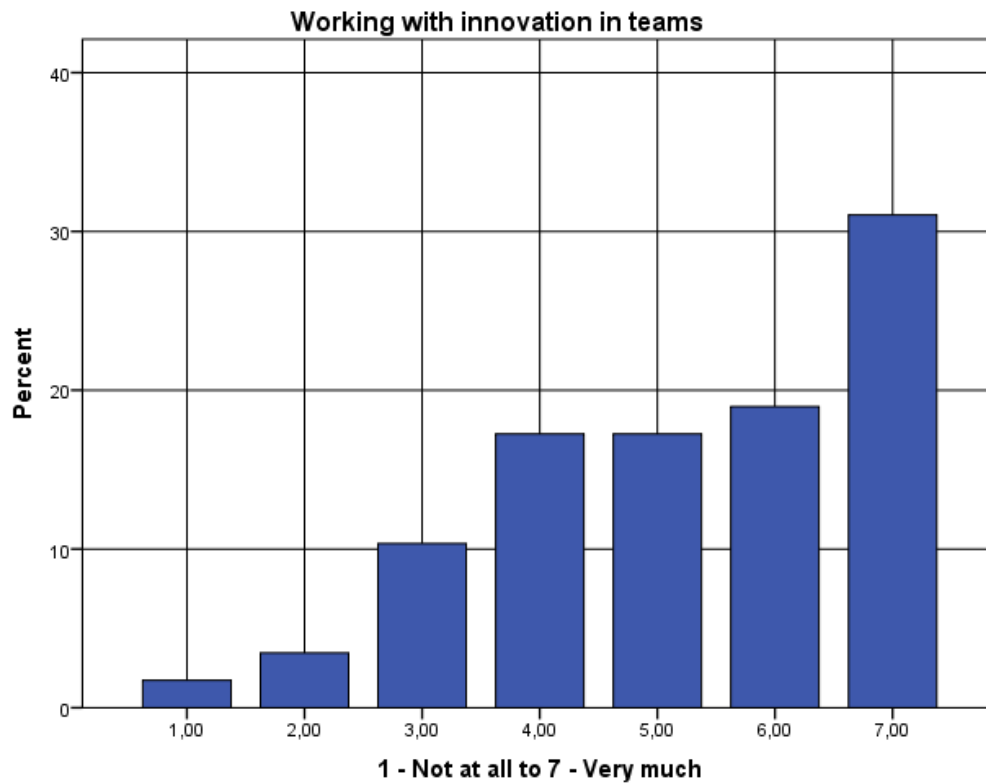


Figure 13 - Teamwork for Innovation

More precisely, Table 30 below breaks down the numbers.

Table 30 - Use of Team as Arena for Work on Innovation

Answer	Frequency	Percent	Percent	Use of Team for Innovation
1 – Not at all	1	1.6%	1.6%	None
2	2	3.3%	29.5%	Low degree/little
3	6	9.8%		Medium
4	10	16.4%		63.9%
5	10	16.4%	Very high degree	
6	11	18.0%		
7 – Very much	18	29.5%		

Answers 5 to 7, representing a high or very high degree of using teams as an arena for working with innovation, adds up to a whole of 63.9%. Including medium usage, the number rises to 80.3%. The mean value is 5.26 with a standard deviation of 1.60.

If divided into the three groups, group 1 have a mean of 5.19 (std. dev. 1.5152), group 2 of 4.67 (std. dev. 2.7325) and group 3 of 5.39 (std. dev. 1.4398). Thus, university program affiliation seems to have a slightly negative effect on usage of teamwork for innovation.

Furthermore, a correlation analysis between this and the other four innovation variables. Table 31. summarizes the results, which show positive correlations for all four innovation variables.

*Table 31 - Correlations of InnoTeam and the Other Innovation Variables*

	<b>InnoProdProc</b>	<b>InnoCompStrat</b>	<b>InnoHR</b>	<b>InnoLeadProc</b>
<i>InnoTeam</i>	0.505*	0.493*	0.441*	0.554*

*\*Significance level of 0.01*

When dividing the sample population in two, segment 1 with scores of 3.5 or lower and segment 2 of scores 4.5 or higher on InnoTeam, an interesting result emerged. A noteworthy difference in innovation capability between segment 1 and 2 could be observed, whereas there was only a small difference in firm performance and no substantial difference in team maturity. 9 entrepreneurship are grouped in Segment 1 and 39 entrepreneurship are grouped in segment 2. Table 32 summarizes the results.

*Table 32 - Detailed Analysis of InnoTeam's effect on team maturity, innovation capability, and firm performance*

<i>Segment</i>	<b>InnoTeam</b>	<b>Team</b>		<b>Innovation</b>		<b>Firm</b>	
	<b>Score</b>	<b>Maturity</b>		<b>Capability</b>		<b>Performance</b>	
		Mean	Std. dev.	Mean	St. dev.	Mean	Std. dev.
<i>Segment1</i>	0-4 (None-medium)	2.89	0.3333	4.64	0.5799	1.97	0.9957
<i>Segment 2</i>	5-7 (High – very high)	2.87	0.3387	5.83	0.4989	2.04	1.0031
<i>Difference (S2-S1)</i>		-0.02	-	1.19	-	0.07	-

In chapter 4.4 there is further analysis on whether there is a connection between the tendency of working in teams and other variables.

## 4.4 Firm Performance Results



In this chapter, the empirical findings for firm performance are presented. The methodology for assessing firm performance as developed for this study is presented in ch. 3.10 How to Assess Firm performance for Entrepreneurships.

A mean analysis, bootstrapping and at a 95 percentile confidence interval level, yields the following results for the financial ratio assessments (Table 33).

Table 33 - Financial Ratio Assessment Means

<b>Financial Ratio</b>	<b>Mean</b>	<b>Std. dev.</b>
<i>Liquidity</i>	2.07	1.2763
<i>Profitability</i>	1.48	1.3367
<i>Solidity</i>	2.39	1.4638
<i>Sales Growth</i>	2.11	1.4036

It is quite interesting that there is large variance in the results, as portrayed by the large standard deviation values. Note therefore that the averages for the financial ratios should be addressed with care. In studies of emergent topics in literature, or where a common method is not yet reached consensus upon, applying adjusted means or other ways of adjusting the raw data is often applied for increased comparability (Beauducel & Herzberg, 2006; Quackenbush, 2002). However, although this might apply for the financial performance construct of this study, we shall stick to the more robust method of the unaltered means and standard deviations.

A bivariate correlation analysis, Pearson's correlation coefficients and 95 percentile confidence interval confirmed that all financial ratios have significant correlations, as portrayed by Table 34.

Table 34 – Correlations for Financial Ratios

	<b>Liquidity</b>	<b>Profitability</b>	<b>Solidity</b>	<b>Sales Growth</b>
<i>Liquidity</i>	1	-0.67	-1.50	-0.10
<i>Profitability</i>	-0.67	1	0.68*	-0.46
<i>Solidity</i>	-0.15	0.68*	1	-0.30
<i>Sales Growth</i>	-0.10	-0.46	-0.30	1

\*significance level at 0.005

Quite surprisingly, there is no significant correlation between most of the financial ratios, except profitability and solidity. However, the sound theoretical foundation and long tradition of applying such financial ratios for firm performance assessment (Delen et al., 2013) allows for still applying these ratios for the firm performance analysis. Even if they do not all correlate, the financial ratios still reflect the firm performance of the entrepreneurship.

Table 35 shows the assessments of the financial ratios. Together, they form the construct that rates firm performance of each entrepreneurship by taking the average of the assessments of the four financial ratios. Note that this assessment is based on an evaluation with special consideration for that these ratios apply to entrepreneurships. For example, weak profitability judged less strictly than if this was a well-established company that were assessed. In total, the firm performance is enhanced by 25% for the entrepreneurships in the sample population that are in a pre-launch state, compared to the firm performances of the entrepreneurships that have reached launch. This is in order to outweigh the different effects of sales growth etc., which is naturally equal to 0 for pre-launch entrepreneurships.

*Table 35 - Firm Performance*

<b>ID tag</b>	<b>Liquidity assessment</b>	<b>Profitability assessment</b>	<b>Solidity assessment</b>	<b>Sales growth assessment</b>	<b>Firm Performance</b>
58106	2,00	3,00	4,00	2,00	3,00
58147	4,00	3,00	4,00	4,00	4,00
58354	2,00	1,00	3,00	1,00	2,00
58416	4,00	0,00	0,00	4,00	2,00
58091	4,00	1,00	1,00	1,00	2,00
58092	2,00	2,00	3,00	4,00	3,00
58099	0,00	1,00	1,00	1,00	1,00
58113	2,00	3,00	3,00	2,00	3,00
58115	2,00	0,00	1,00	3,00	2,00
58340	1,00	0,00	0,00	1,00	1,00
58414	3,00	4,00	4,00	4,00	4,00
58419	4,00	1,00	1,00	1,00	2,00
58527	2,00	1,00	2,00	1,00	2,00
58539	0,00	1,00	1,00	1,00	1,00
58842	4,00	4,00	4,00	1,00	3,00
58844	4,00	3,00	3,00	4,00	4,00
58848	0,00	0,00	1,00	1,00	1,00
58588	2,00	3,00	3,00	4,00	3,00
58595	2,00	3,00	4,00	3,00	3,00
58599	4,00	3,00	4,00	4,00	4,00
58620	1,00	1,00	1,00	1,00	2,00

58625	2,00	0,00	3,00	4,00	3,00
58682	4,00	0,00	0,00	4,00	2,00
58694	3,00	0,00	0,00	0,00	1,00
58704	1,00	0,00	0,00	1,00	1,00
58708	1,00	0,00	1,00	4,00	2,00
58725	1,00	0,00	3,00	1,00	2,00
58732	4,00	2,00	4,00	4,00	4,00
58738	3,00	4,00	4,00	4,00	4,00
58762	4,00	0,00	4,00	1,00	3,00
58785	3,00	1,00	4,00	1,00	3,00
58811	3,00	1,00	1,00	1,00	2,00
58671	1,00	1,00	4,00	1,00	2,00
58831	2,00	1,00	3,00	4,00	3,00
58833	1,00	0,00	4,00	1,00	2,00
58851	3,00	1,00	4,00	1,00	3,00
58856	1,00	1,00	4,00	2,00	2,00
58885	1,00	1,00	1,00	1,00	2,00
58891	4,00	4,00	4,00	3,00	4,00
58895	1,00	1,00	1,00	1,00	2,00
58898	3,00	0,00	4,00	0,00	2,00
58904	4,00	1,00	4,00	1,00	3,00
58907	1,00	1,00	4,00	1,00	2,00
58912	1,00	1,00	1,00	1,00	2,00
58913	1,00	4,00	1,00	1,00	2,00
58914	1,00	1,00	1,00	1,00	2,00
58915	1,00	1,00	1,00	1,00	2,00
58926	1,00	1,00	1,00	1,00	1,00
58931	2,00	3,00	3,00	2,00	3,00
58933	0,00	0,00	0,00	3,00	1,00
58934	2,00	3,00	3,00	2,00	3,00
58938	0,00	4,00	3,00	4,00	3,00
58941	1,00	1,00	1,00	1,00	1,00
58990	4,00	1,00	4,00	1,00	3,00
58993	2,00	4,00	3,00	4,00	3,00
59009	1,00	1,00	1,00	1,00	2,00
59032	2,00	2,00	3,00	4,00	3,00
59085	2,00	0,00	4,00	4,00	3,00
59101	2,00	3,00	3,00	4,00	3,00
59102	2,00	1,00	3,00	4,00	3,00
59592	1,00	1,00	1,00	1,00	2,00

The distribution of the firm performance levels is as follows (Table 36):

Table 36 - Frequencies of Firm Performance Levels

<b>Firm performance level</b>	<b>N</b>	<b>Percentage of sample population</b>
<i>0 – Poor</i>	0	0
<i>1 – Moderate</i>	9	14.8
<i>2 – Satisfactory</i>	24	39.3
<i>3 – Good</i>	21	34.4
<i>4 – Very good</i>	7	11.5

This yields an average value of firm performance for the sample population as a whole at 2.01, which is equal to a satisfactory level. Table 37 shows the mean value of firm performance for the whole sample population, group 1, 2, and 3.

Table 37 - Firm Performance Mean Values

	<b>Mean</b>	<b>Std. dev.</b>
<i>Whole sample population</i>	1.99	1.0654
<i>Group 1</i>	1.90	1.1783
<i>Group 2</i>	2.17	1.2065
<i>Group 3</i>	2.01	1.0217

All groups have been assessed to have satisfactory firm performance (~2). Standard deviations are all relatively high (~1.1).

4.5 Is There a Connection? The relationship between team maturity, innovation capability, and firm performance

In this section, there will be a description of the analyses that have been run in the pursuit of mapping out whether there is a relationship between team maturity, innovation capability and/or firm performance, and if so, what defines the qualities of these relationships.



#### 4.5.1 Correlation analysis

First of all, a summarizing table shows the mean scores for team maturity, innovation capability and firm performance. As Table 38 shows, there are very little difference across groups 1-3 for the overall level of team maturity, innovation capability, and firm performance.

Table 38 - Summarized results for team maturity, innovation capability, and firm performance

	Team Maturity		Innovation Capability		Firm Performance	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Group 1	2.94	0.2500	5.65	0.5953	1.90	1.1783
Group 2	3.00	0.0000	5.43	0.5949	2.17	1.2065
Group 3	2.79	0.4104	5.52	0.8136	2.01	1.0217
Whole sample population	2.77	0.2520	5.52	0.7134	1.99	1.0654

Despite running many variations of correlation tests, there has been found no significant correlation or other evident relationship between team dynamics, innovation capability, and firm performance with this method. Table 39 below displays the bivariate correlation analysis results for team maturity, innovation capability and firm performance. NB: As there is very little change in team maturity for group 1 previous versus current team maturity, there has only been taken consideration to current team maturity levels for these analyses. Separate correlation analyses on team maturity, innovation capability and firm performance for each of the groups 1-3 neither showed any significant correlations (sig.  $\leq$  0.05).

Table 39 - Correlation Analysis for Team Maturity, Innovation Capability, and Firm Performance

		Team Maturity	Innovation Capability	Firm Performance
Team Maturity	Pearson Correlation	1	0.136	-0.140
	Sig. (2-tailed)	-	0.305	0.290
Innovation Capability	Pearson Correlation	0.136	1	-0.010
	Sig. (2-tailed)	0.305	-	0.939
Firm Performance	Pearson Correlation	-0.140	-0.010	1
	Sig. (2-tailed)	0.290	0.939	-

#### 4.5.2 Cluster Analysis

Moreover, different variations of cluster analyses were also run, in order to address whether there existed subgroups in the data sample which were characterized by certain variables. Only a few cluster analyses resulted in distinct clusters. As the sample size of this study is relatively small, it is extra important to very aware that cluster analysis can be less purposeful. Although running a cluster analysis always gives a result, the result may not be of sufficient quality (Ketchen Jr & Shook, 1996). Although there is no generally accepted rule of thumb (Bryman, 2012; Mooi & Sarstedt, 2010), Formann (1984) recommend that a minimum sample size of  $2^m$  is applied, where  $m$  is the number of clustering variables. Meaning, with our sample size of  $N = 61$  entrepreneurship, a maximum of 6 variables should be applied for the clustering ( $2^6=48 < 61$ ).

Moreover, common sense must be applied in judging what clustering variables makes sense to include and what is a sensible sample size-clustering variable ratio (Mooi & Sarstedt, 2010). For example, the relative cluster sizes should also be evaluated. Eldridge, Ashby, and Kerry (2006) recommend relative cluster sizes  $< 0.65$  in general. For more precise evaluation, the coefficient of variation (SD/Mean) should also be considered when assessing an acceptable difference in cluster sizes (Hayes & Bennett, 1999). Relative cluster sizes were considered in evaluating the cluster quality.

Initially, a clustering based on team maturity and innovation capability as clustering variables was performed, and then run for ANOVA-analysis for the firm performance means of the clusters. However, this did not lead to good cluster quality. Probably, this is partly related to that there was little variance in both team maturity and innovation capability, which makes it

difficult to distinguish clusters of distinct qualities. All clustering variables relevant for the two research questions were attempted, i.e. team maturity, innovation capability, firm performance, and group number in different combinations.

There was performed two-step cluster analysis with Schwarz's Bayesian criterion for clustering. Two-step clustering was applied instead of K-means or other clustering methods, in consideration of the relatively small sample size. K-means clustering is a non-hierarchical clustering method which in some ways outperforms two-step clustering and other hierarchical methods, however the pre-definition of number of clusters of K-means clustering is problematic in this kind of exploratory study (Ketchen Jr & Shook, 1996). The one-way ANOVA analysis was run with polynomial contrasts, LSD, Bonferroni and Sidak post hoc tests, and bootstrapping with 95 percentile confidence intervals. Table 40 displays the results for these analyses. The left side of the table show what clustering variables are applied, and whether it lead to a good quality clustering. The right-hand side of the table show the ANOVA results for the clustering cases with adequate cluster quality.

There are few distinct differences that can be said to depict a clear pattern; for most constellations of clustering variables for the cluster formation, the ANOVA results remains in more or less the same. However, a few patterns emerge, as will be discussed in ch. 5.2.4.

Table 40 - Cluster Analysis and ANOVA Results

**Cluster analysis**

**One-way ANOVA and \*descriptive statistics of clusters**

	Cluster analysis			One-way ANOVA and *descriptive statistics of clusters											
	TM	IC	FP	Group No.	No of clusters	Cluster quality	Cluster no.	TM		IC		FP		Group No.	
								Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	St. dev.
1	X	-	-	-	2	Good	1	3.00*	0.0000*	5.57	0.6829	1.95	0.9575	2.29	0.7071
							2	2.00*	0.0000*	5.28	0.9661	2.34	0.94432	2.75	0.8860
2	X	X	-	-	1	-	-	-	-	-	-	-	-	-	-
3	X	X	X	-	1	-	-	-	-	-	-	-	-	-	-
4	-	X	-	-	1	-	-	-	-	-	-	-	-	-	-
5	-	X	X	X	1	-	-	-	-	-	-	-	-	-	-
6	-	-	X	-	2	Poor	-	-	-	-	-	-	-	-	-
7	-	X	X	-	1	-	-	-	-	-	-	-	-	-	-
8	-	-	X	X	2	Good	1	2.95	0.2132	5.59	0.5893	2.01*	1.0897*	1.27*	0.4558*
							2	2.81	0.3971	5.49	0.7991	2.01*	0.8848*	3.00*	0.0000*

9	-	-	-	X	3	Good	1	2.94	0.2500	5.65	0.5953	2.02	1.1272	3.00*	0.0000*
							2	3.00	0.0000	5.43	0.5949	2.00	1.0840	1.00*	0.0000*
							3	2.79	0.4104	5.52	0.8136	2.05	0.9020	2.00*	0.0000*
10	X	X	X	X	1	-	-	-	-	-	-	-	-	-	-
11	X	-	-	X	4	Good	1	3.00*	0.0000*	5.55	0.7431	1.96	0.8810	3.00*	0.0000*
							2	3.00*	0.0000*	5.66	0.6136	1.93	1.1159	1.00*	0.0000*
							3	2.00*	0.0000*	5.28	0.9661	2.34	0.9443	2.75*	0.7071*
							4	2.00*	0.0000*	5.43	0.5949	2.00	1.0840	2.00*	0.0000*
12	X	-	X	X	2	Good	1	2.95*	0.2132*	5.59	0.5893	2.01*	1.0897*	1.27*	0.4558*
							2	2.81*	0.3971*	5.49	0.7991	2.01*	0.8848*	3.00*	0.0000*
13	X	X	-	X	1	-	-	-	-	-	-	-	-	-	-
14	-	X	-	X	1	-	-	-	-	-	-	-	-	-	-
15	X	-	X	-	2	Good	1	2.95*	0.2132*	5.59	0.5893	2.01*	1.0897*	1.27	0.4558
							2	2.81*	0.3971*	5.49	0.7991	2.01*	0.8848*	3.00	0.0000

#### 4.5.3 Correlation Analysis between Elements of Team Maturity, Innovation Capability, and Firm Performance

It is surprising (and a bit frustrating) to not achieve the results which our hypotheses suggest. However, it is the researchers plight to accept it, and pursue the reasons behind the unexpected results. Further details were therefore added to the correlation analysis. As we have examined other descriptive statistics of the sample population, such as what type of operation the entrepreneurship focuses on (product, service etc.), these variables were analyzed as well.

Full results are displayed in Appendix 10 for brevity in the thesis text. Note that on average, there seems to be no connection between most of the data. However, some variables were found to have significant correlations. The following Table 41 portrays where significant correlations were found, as extracted from Appendix 10. Here we go deeper into details, assessing the underlying factors in each of the correlating variables.

Table 41 - Detailed Correlation Analysis

	2	6	8	9	10	11	12	13	14
2 Team Maturity (TM)	1	-	-	-	0.69*	-	-	-	-
6 Teamwork for Innovation	-	1	-	-	-	-	0.70*	-	0.75*
8 Profitability	-	-	1	0.68*	-	-	-	-	-
9 Solidity	-	-	0.68*	1	-	-	-	-	-
10 Growth Sales	0.61*	-	-	-	1	-	-	-	-
11 InnoProdProc	-	-	-	-	-	1	0.50*	0.50*	0.42*
12 InnoCompStrat	-	0.70*	-	-	-	0.50*	1	0.40*	0.38*
13 InnoHR	-	-	-	-	-	0.50*	0.40*	1	0.66*
14 InnoLeadProc	-	0.75*	-	-	-	0.42*	0.38*	0.66*	1

\*Significance level 0.05

Moreover, the innovation capability variables InnoCompStart and InnoLeadProc can be analyzed on a level further down still, to the very individual elements it is built upon. The correlation analysis between the underlying elements of each of these innovation capability variables and teamwork for innovation is summarized with significant correlations in Table 42 below.

Table 42 - Correlation Analysis of Elements in InnoCompStrat and InnoLeadProc with Teamwork for Innovation

	Q	TW	4	5	6	7	11	12	13	14	15
Teamwork (TW)	16	1	-	0.33 *	0.40 *	-	0.46 *	0.26 *	0.33 *	0.52 *	-
	4	-	1	0.57 *	0.32 *	-	0.33 *	0.30 *	0.30 *	-	-
InnoCompStrat	5	0.33 *	0.57 *	1	-	-	0.43 *	0.37 *	0.37 *	-	-
	6	0.40 *	-	0.32 *	1	-	-	-	-	-	-
	7	-	-	-	-	1	-	-	-	-	-
	11	0.46 *	0.33 *	0.43 *	-	-	1	0.33 *	0.56 *	0.37 *	-
InnoLeadProc	12	0.26 *	-	0.30 *	0.38 *	-	0.33 *	1	0.34 *	0.43 *	-
	13	0.33 *	0.30 *	0.37 *	-	-	0.56 *	0.34 *	1	0.37 *	-
	14	0.52 *	-	-	-	-	0.37 *	0.43 *	0.37 *	1	-
	15	-	-	-	-	-	-	-	-	-	1

\*Significance level 0.05

Table 43 explains which topic which is linked to each element of the innovation capability variables Q.

Table 43 - Explanation of Topics Represented by Code Q

Q	Topic
4	Technological competence
5	Individual knowledge and competence
6	Innovation strategy
7	External sources to innovation
11	Innovation leadership
12	Innovation Processes
13	Change management, risk willingness
14	Creativity
15	Operational performance indicators

## 4.6 Case Study



In addition to analyzing out full set of data on the sample population, we shall also devote some extra attention to our Case Study.

### 4.6.1 About the Case Study Entrepreneurship

The case study entrepreneurship is a business that have reached product launch a couple of years back. This makes it a young, yet somewhat established entrepreneurship. The entrepreneurship has worked up some regular clients, generated a steadier income, and achieved growth. It has grown both in terms of business and in terms of size and employees. The business is a product provider, operating in high tech industry. It targets mostly Nordic and European markets, but have clients elsewhere globally as well.

The entrepreneurship has achieved awards and credits for successful startup business, and is expected to prosper in the future as well. It is not affiliated to a University Master's Program for Entrepreneurship (Gr. 3), yet it has ties to the academic world. Furthermore, partnering and collaborating is an important part of the entrepreneurship's business strategy.

Simultaneously, the entrepreneurship is faced with several strong competitors. Furthermore, the market it operates in is in quick and extensive development, affected by many sorts of technology development. The entrepreneurship will therefore meet great pressure with regards to keeping up with both incremental and disruptive innovations, meaning it will have to stay innovative. Innovation capability is therefore very important for the case study entrepreneurship.



The case study is marked with the ID-tag 58106 throughout the paper. Two respondents, representing different parts of the business have answered the survey on behalf of the entrepreneurship. The scores are the average of the answers.

#### 4.6.2 Case Study Team Maturity



The table below shows a detailed analysis of the 12 SPGR vectors that are used for calculating Team Maturity.

Table 44 - Case Study Entrepreneurship SPGR Data 12 vectors

**58106**

Code	Typical behavior	Score
<i>S1 Engagement</i>	Energetic, inviting others to contribute	2.00
<i>S2 Empathy</i>	Supportive, showing interest for others	2.50
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	2.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	3.50
<i>O1 Criticism</i>	Critical, opposing	1.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	2.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	1.50
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	0.50
<i>N1 Caring</i>	Taking care of others, attentive to relations	1.50
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	0.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	1.50
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	3.00

Applying our method of analysis, the following results are yielded (Table 45):

Table 45 – Case Study Team Maturity

<i>Dimension/Vector</i>	<i>Value (rounded off)</i>	<i>Maturity level</i>
<i>N1-C1</i>	0	4
<i>N2-C2</i>	3	1
<i>O1-D1</i>	1	3
<i>O2-D2</i>	1.5	2
<i>W1</i>	1.5	3
<i>W2</i>	0.5	4
<i>S1</i>	2.00	2
<i>S2</i>	2.50	3
<b>Total Maturity level assessment</b>		<b>3</b>

From our analysis, we see that the case study entrepreneurship 58106 has high team maturity, equivalent to production in spin-theory (Sjøvold, 2006a, 2014).

#### 4.6.3 Case Study Innovation Capability



The case study entrepreneurship’s innovation capability is calculated from the following values of innovation variables (Table 46):

Table 46 - Case Study Innovation Capability

<i>InnoProdProc</i>	6.00
<i>InnoCompStrat</i>	5.00
<i>InnoHR</i>	5.67
<i>InnoLeadProc</i>	4.00
<b>Innovation Capability</b>	<b>5.17</b>

The innovation capability of the case study is very good, as are all the innovation variables except for InnoLeadProc, which is slightly inferior (good).

#### 4.6.4 Case Study Firm Performance



The firm performance of the case study is as explained by Table 47:

Table 47 - Case Study Firm Performance

<i>Liquidity</i>	2,00
<i>Profitability</i>	3,00
<i>Solidity</i>	4,00
<i>Sales growth</i>	2,00
<b><i>Firm Performance</i></b>	<b>3,00</b>

Here, the financial ratios behind the final firm performance vary more. Ranging from 2 (satisfactory) in terms of liquidity and sales growth, to 4 (very good) in terms of solidity. This lands the overall firm performance at 3 (good).

#### 4.6.5 Case Study Interviews

Qualitative data about the product development and team work in the case company was gathered through interviews. Two main interviews were performed, with both a technical point of view and a business point of view. The most interesting statements are presented below.

##### Technical interviewee:

The technical interview was one of the first employees in the case business, and have thus deep insight in the (technical) development of the case company.

The case company is working with clear and defined goals and a vision for what it shall be: "At the point that I started, it was already decided that the company should operate as an X business." Moreover, the CEO and founder has an active and firm participation in the development and implementation of strategy and goals.

The team works closely, with frequent meetings on strategy and technical development. The team still depends on initiative and creativity of the individual team member. As the interviewee said about an example where the team was stuck and didn't see how to proceed:

“It ended up with me making the proof of concept over a weekend, finding a way to solve the issue.”

The entrepreneurship collaborates closely with other similar businesses, and benefits from being co-located. The interviewee informs that among other things, it eased communication which allowed for sharing competence for developing innovative solutions. As the interviewee said: “Their competence on X was probably quite decisive for us being able to put together a proof of concept in the beginning.” Furthermore, it also had positive effect on recruiting.

Partnering up with strategic alliance have been part of the economic success of the company. “After we turned around to having (partner) delivering (part of solution) (...), there were more customers and the time from pilot to completion went down.”

From the beginning, limited resources have been a challenge in the case company. One example was when the concept of a major new feature was drawn up, and the technical solution had to be made: “I had to sit alone and build the system for a new solution, which took 100% of my time. I could only work briefly on other cases, which almost lost us an important client.” Other times, it leads to projects being shut down: “Such projects had to be shut down at a certain time because of the lack of resources.”

Furthermore, the lack of resources took a toll on motivation: “When we didn’t have time to work on the core operation of the company and the products didn’t work as well as they should, it affected our motivation.”

#### Business interviewee:

It is clear that innovation has been and is still important for the case company, although the focus of the business has changed from the very start to day’s date: “In the beginning, we worked on developing a whole product solution, whereas now we are focusing on specialization.” However, as the interviewee stated about product development: “Innovation is important for cash flow!” Moreover, internal process innovations are also valued: “Innovations makes the workday easier.”

Moreover, the modest size of the company allows for valuable informal collaboration and collective innovativeness: “As the company is small, there is little structure. This allows for a flowing communication between business and technical development. It is a benefit of being small.”

The company also has the benefit of being agile: “Strategic plans are typically laid down for half-year cycles, however they are continuously open for modification.” The interviewee adds: “Meetings are frequent, close and informal.” Ideas are generated internally in the team across specializations or work domains, however external input from clients and partners is a valuable contribution to the innovations and product development of the company.

Another interesting point is that the employees feel ownership to the products they participate in developing. “There is an inner motivation for doing well and creating a good product.” Furthermore, it is added: “There’s a culture for ideas.” The case company depends heavily on its human capital: “Optimistic people who are positive to ideas is important.”

The interviewee points to the same as the technical interviewee, that it has taken a toll on motivation when resource limitations have restricted extent and quality of projects. “We have unlimited with ideas but limited resources, which forces us to prioritize. This is difficult.”

An interesting side note is that neither of the interviewees recognized their work in the case company as innovation work. The concept was clearly not applied in context of their work, although as seen from the outside the case company delivers innovative solutions by combining known technology in new ways. Furthermore, the technical solutions are all developed in-house, which means the team continuously works on developing new and better coding and technology for their products. Part of the technology and solutions is still not in use on a commercial or large scale, especially not in the context that the case company offers.

## 5. Discussion

In this section, the empirical findings will be analyzed in light of the theoretical foundation of the study. First, a separate analysis of each of the three topics, team maturity, innovation capability, and firm performance, will be presented. In this part, we will both increase the understanding of each of the three topics, and also investigate whether the hypotheses for RQ2, H4, H5 and H6, holds. Secondly, all three main topics will be combined in an analysis of the connection between the three, through which we shall investigate RQ 1 and hypotheses H1, H2, and H3 of the study. Finally, a comprehensive analysis of the case study entrepreneurship will follow, where further understanding of RQ1 will be gained.

### 5.1 Team Maturity



As seen by the results, summarized in Table 22 and Table 23, the levels of team maturity were quite even over all of the sample population entrepreneurs. All teams were assessed to a maturity level of either 2 (team spirit) or 3 (production). The mean team maturity was found to be 2.77 (including only new measurements in group 1), with a relatively low standard deviation of 0.25. This was different from the expected result, which was to find a wider dispersion of maturity levels with an overweight of level 4 (innovation) team maturity. The

implications of team spirit and production team maturity will be explained in the two initial subchapters following next.

Assessing team maturity entails analysis of a complex combination of flexibility and responsiveness in role patterns and the four basic group functions (Sjøvold, 2006a, 2006b, 2007, 2014), as explained in chapter 2.2 Team Dynamics: Team maturity in entrepreneurial teams. Therefore, we know that assessing a team's team maturity is tricky business. Note therefore, that we can only deduct the most *likely* maturity level of each entrepreneurial team. However, without additional direct observation of the team in *modus operandi*, we cannot state that this is unquestionably and without a doubt the maturity level of said teams. Also, team maturity levels can change over time (Sjøvold, 2006a, 2006b, 2014), whereas our data is mostly a snapshot of the group in a certain period of the entrepreneurial team's existence. Lastly, the quantification of team maturity into four distinct levels eases understanding and analyzing the concept, whereas in real-world-teams, maturity is more of an ability to master more or less advanced team dynamics.

Nevertheless, we base our assessment of the entrepreneurial teams on sound theoretical foundations and the well-tested and extensively applied SPGR method and spin-theory, and therefore deem that that our analysis is correct to a sufficient degree for the purpose in this study.

Quite interestingly, there was no significant correlation between the tendency on working in teams and the team maturity of the entrepreneurial teams. This was opposite of what was expected, as working on innovations in teams implies that the team is able to collaborate closely on complex tasks which entails a higher team maturity level. Furthermore, through working on innovations together in the team, the team also experiences practical team building, which have been found by Sjøvold (2006b, 2007) to be a means to increase and consolidate team maturity.

#### *5.1.1 Team Maturity Levels: Team Spirit*

Eight entrepreneurial teams were found to have team maturity equivalent to level 2, team spirit. This is equivalent to 10.5% of the total sample population. A team maturity level of team spirit means that these entrepreneurial teams experience strong cohesion with a distinct sense of "us" and "others". Strict rules and procedures defines the dynamics of the team (Sjøvold, 2007, 2014).

Team spirit maturity mean that the team can handle low efficiency, low complexity tasks with a high need for cooperation (Sjøvold, 2006a, 2007, 2014). This is in contrast with innovative work, which typically involves solving wicked problems and close collaboration across specialized knowledge fields on a high level (Castellacci et al., 2005). Recall that it has been found that team dynamics is especially important for the overall level of innovation in a team (Scholten et al., 2007; West & Anderson, 1996). Meaning, it is unlikely that the entrepreneurial

teams that have a team maturity of team spirit are capable of producing truly innovative work. Thus, these entrepreneurial teams are likely to score low on innovation capability, from what theory indicates.

Furthermore, a disruptively changing context will demand more than incremental innovation from a team to be successful (Benner & Tushman, 2003). A team spirit team maturity will therefore entail that the entrepreneurial team will not be able to handle anything other than a stable context. For most entrepreneurs, the context of the business is unpredictable and may be disruptively changing from innovations of competitors. Thus, the theoretical foundation implies that the entrepreneurial teams of the study that fall under the team maturity category team spirit will probably score low on firm performance.

#### *5.1.2 Team Maturity Levels: Production*

The clear majority of the sample population was found to have a team maturity equivalent to production. 68 entrepreneurial teams, equal to 89.5% of the population had this team maturity level. Note that both old and new measurements of group 1 is included as individual measurements. The production maturity level entails that the entrepreneurial team is able to collaborate on a high level, also accessing external resources. The group obtains cohesion through long term contributions and commitment of the team members (Sjøvold, 2006a, 2007, 2014).

The entrepreneurial teams with a team maturity of production are able to handle tasks of higher complexity (Sjøvold, 2006a, 2006b, 2007). This implies that these entrepreneurs should be able to produce innovative work. However, the disruptiveness of the innovation might be more or less limited. More incremental innovations however, should be well within the range of these teams. Thus, we expect the innovation capability level of these entrepreneurial teams to be higher than the team spirit maturity level teams, yet still not in the positive extremity of the scale.

On the other hand, the production team maturity level also entails that the entrepreneurial teams are not able to handle complex and disruptively changing contexts. The production maturity level can handle only small, incremental changes in context (Sjøvold, 2007). Meaning, if the competitors of the entrepreneurship are changing the market by issuing radical innovations, the entrepreneurship will not be able to keep up with the competition. Thus, the degree of disruptive change in the context of the entrepreneurial team will likely decide whether or not the entrepreneurship will have a high firm performance.

Drawing a parallel to the team maturity level that was expected to occur most often in the sample population, innovation, the difference from production is that at this team maturity the team can handle both complex tasks and a disruptively changing context. Meaning, the team would then be able to both produce and compete with radical innovations, implying excellent levels of both innovation capability and firm performance. Curiously, no firms in the

sample population were found to have a team maturity level of Innovation. Two potential underlying causes come to mind: Either, the assessment criteria of team maturity are set too strict, or the results reflect the true maturity level of the entrepreneurial teams. As the assessment of team maturity is based on well-established SPGR methodology and spin-theory, it is assumed that the results of the study are viable without significant methodological error. Thus, it seems that innovation level team maturity is extremely rare among Norwegian entrepreneurial teams.

#### *5.1.3 University Program Influence on Team Maturity*

Hypothesis 4 formulate the expectance of a positive relationship between an affiliation with a University program for entrepreneurship and the team maturity level of the entrepreneurship. When testing the average team maturity levels of the three groups, group 1 had a current team maturity of 2.73, group 2 of 2.69, and group 3 of 2.73. The standard deviations were relatively low, at 0.23, 0.15, and 0.28 respectively for group 1 through 3. This means that rounded off, all three groups had an average team maturity level of 3 – production.

Thus, it has been found that although group 1 and 2 have an affiliation with a university entrepreneurship program, they do not outperform group 3 which has no such affiliation. Meaning, the hypothesis H4 has in part been rejected, as the means analysis has found no pattern linking affiliation to entrepreneurship university program to team maturity.

#### *5.1.4 University Program Influence: Longitudinal Analysis of Group 1*



Furthermore, it is expected that the team maturity of the entrepreneurial team can change over time as a result of being in a context of the university program for entrepreneurship. This is based on the team development theory that practical teamwork happens through the team working together in situations similar to those it will have to face later on (Sjøvold, 2006b). The entrepreneurship program focuses on just this, forming teams that practice on practical situations and issues they will face as registered businesses after graduation.

The study shows that the average team maturity of entrepreneurial teams in group 1 was previously 2.95, and is now on average 2.73. The standard deviations also stayed stable, at 0.15 and 0.23, respectively for the old and new measurement. Note that the change in average team maturity is within the standard deviation of the new measurement, and not far above the standard deviation of the old measurement. The small change in team maturity over the two measurements means the overall level of maturity is still assessed to production, entailing no greater change. Thus, we can derive that the university program has had no such developing effect of significance on the entrepreneurial teams' team maturity.



Moreover, it is interesting that the slight change is negative (-0.22). Rather, it would have been expected for the entrepreneurial teams to increase their team maturity levels through teambuilding that prepare them for operating in a competitive and innovative market. If methodological and measurement error is disregarded as a potential cause, this might imply that the entrepreneurial university program is suboptimal with regards to team maturity. Another potential cause might be that a maturity level of production simply enough is sufficient for a satisfactory level of successfulness for the entrepreneurships. We will return to this topic in a broader perspective in ch. 5.4 and 5.5, discussing team maturity in link with innovation capability and firm performance. For now, we can deduce that no support has been found in support of hypothesis H4.

## 5.2 Innovation Capability



Similarly to the team maturity results, the innovation capability levels of the entrepreneurships of the sample population were on a relatively even level. The innovation capability scores were on a higher overall level. This applied to both the innovation capability construct score as a whole, and when the score was broken down to the four underlying innovation variables InnoProdProc, InnoCompStrat, InnoHR and InnoLeadProc.

### 5.2.1 Innovation Capability Levels

Six entrepreneurships, equal to 9.84% of the sample population, were measured to have an innovation capability of 4 on a scale from 1 to 7, which is a good innovation capability. 20 entrepreneurships (32.8%) had an innovation capability of 5, and 34 entrepreneurships (55.7%) had an innovation capability of 6. Thus, a whole of 54 entrepreneurships, 88.50% of the sample population, had been assessed to have a very good innovation capability (5 and 6). One entrepreneurship was found to have extremely good (7) innovation capability. This means there is an overall high level of innovation capability among the sample population. This is very interesting considering that we have found that the entrepreneurships on average does not have a team maturity level that is high enough to confront the challenges posed by radically innovative work. Or perhaps this indicates that production is a sufficient team maturity level for the average entrepreneurship? We shall return on this point in ch. 5.4.

On average, the innovation capability was 5.52. The standard deviation is relatively moderate at 0.71. This equals a high innovation capability level. Such a high innovation capability level entails that all the entrepreneurial teams in the sample population have a high ability to create innovations, through their overall high abilities linked to each of the four innovation variables. Following our hypothesis H2, we then expect to see high firm performance among the entrepreneurships as well. In ch. 5.4, we return on this point.

As for H1, the means analysis suggests initial support for this hypothesis. Both high team maturity and high innovation capability is found on average, suggesting that these two variables are connected. Note however, that the average level of innovation capability is slightly higher than the average team maturity level.

As an interesting side note, the standard deviation of innovation capability is somewhat higher than what was found for team maturity, meaning the variation is higher in innovation capability than in team maturity. However, as the scale for the innovation capability has a wider span (7 levels) than team maturity (4 levels), this can in part explain the relative difference. Nevertheless, a standard deviation of almost a full level means that there is some variation in the entrepreneurs' capabilities.

For now, it might be useful to break the innovation capability construct further down to its more basic elements in order to deepen the detail level of the analysis. Revisit table 3 to recall the five perspectives on innovation, of which I to IV are included in the innovation capability construct. All innovation variables I-IV were found to contribute evenly to the construct, and all the innovation variables I-V correlated internally with each other. So, what do the scores of each of the five variables representing one of the five perspectives entail for the capabilities of the entrepreneurship? Revisit table 12 for a visual summary of the link between theoretical perspectives, survey questions, and innovation variables.

Another point that is worth making, is that the observed importance of measuring innovation capability as a construct of many elements is evident, as all four perspectives have been found to correlate significantly with high correlation coefficients of 0.38 to 0.66. This supports findings in other papers, which have pointed out a research gap where studies have only applied a single-element measurement of innovation capability (Vicente et al., 2015). This is also expected by that theory describe many of the innovation capability variables as interdependent.

### *5.2.2 Innovation Dimensions*

Perspective I: Innovation dimensions, is represented by innovation variable InnoProdProc. The variable measures the entrepreneurship's innovation capability with regards to product- or service innovations and process- or organization innovations. The average score of this variable was found to be 5.69 with a standard deviation of 0.98. Such a high average level entails that the entrepreneurs are performing well at generating both internal and external innovations. The assessment of the innovation capability linked to this perspective is basically a measure of how innovative the entrepreneurship is at its core business and how well the company adapts to perform well in its core business. Meaning, the high score indicates that the entrepreneurs are innovative with regards to their core business and how they work with their core business.

Recall also that there has been found a positive feedback effect between innovation capability linked to internal innovations, and the ability to generate external innovations (Hogan & Coote, 2014). Part of the key to obtaining this, is to consider the context of innovation and adapt innovation strategy and management to this (Hogan & Coote, 2014). The findings confirm this relationship, as it has been found a high level of both internal and external innovation capability in the analysis.

In summary, it has been found that that the entrepreneurships are innovative with regards to their core business and how they work with their core business, transmitted via both internal and external innovations.

### *5.2.3 Strategic Resource Based View: Competence and Technology*

Perspective II: SRB view competence and technology is represented by the innovation variable *InnoCompStrat*. The variable measures the overall level of internal resources (i.e. technology and competence), and how well the entrepreneurships facilitates for the contribution to innovation from both internal and external resources via its innovation strategy. The average score of this variable was found to be 5.51 with a standard deviation of 0.98.

Such a high average level entails that the entrepreneurship holds internal resources in the form of competence and technology which is valuable, rare and difficult to substitute or imitate. This can give the entrepreneurship a competitive advantage through enabling it to create innovative solutions that the competition cannot (Barney, 2001; Peteraf, 1993; Vicente et al., 2015). Moreover, perspective II also considers the ability to incorporate and apply external resources. Nurturing such external relations and improving on nurturing them, can be an important positive influence on the firm's innovation capability (Iddris, 2016; Samson & Gloet, 2013). Thus, the entrepreneurships are found to be good at exploring and exploiting external resources.

Furthermore, an innovation strategy that facilitates the contribution of these resources to innovation is part of making the internal resources actually contributing to innovation capability. For instance, technological competence can contribute to both internal and external innovations (Atalay et al., 2013), thus linking Perspective I and II. This corresponds well with the results of this study, which found that perspective I and II correlate positively with 0.497 and both have high mean scores.

In summary, the high score of this perspective on innovation capability tells us that overall, the entrepreneurships of the sample population have valuable internal resources, and are capable of handling both internal and external resources well with regards to innovation.

### *5.2.4 Strategic Resource Based View: Human Capital*

Perspective III: SRB view human capital is represented by the innovation variable *InnoHR*. The variable measures the overall level of the innovation capability that is embedded in the human

capital of the entrepreneurship, and how well the entrepreneurship facilitates for this resource to come to use. The average score of this variable was found to be 5.84 with a standard deviation of 0.97. This is the highest mean score of the four innovation variables, which suggests that human capital is the most important driver for innovation capability in Norwegian entrepreneurships.

Such a high average level entails that the entrepreneurships have valuable internal resources linked to human capital, and that these resources are applied well to contribute to innovation. This is in part facilitated through generating a supportive organizational culture and managing human resources (Hogan & Coote, 2014). This is based on a solid theoretical foundation on the importance of psychological safety for creativity and innovativeness to thrive (Edmondson, 2012, 2013; Saunila & Ukko, 2014). Perhaps, the typically non-hierarchical and high educational level of Norway is part in making human capital bloom as a valuable resource in Norwegian entrepreneurships?

The internal resources linked to the two SRB view based perspectives on innovation capability are - naturally - connected. Technology and competence is often individual and tacit, linked to the individual (Saunila & Ukko, 2014). Meaning, the innovation capability linked to perspective II is moderated through perspective III. The competence only comes to use if each individual is enabled to contribute with his/her share of it. Otherwise, the resource would lay latent and not contribute to innovation. This corresponds to the results of this study, where perspective II and III correlated positively with 0.39 and both had high mean levels. Note that Perspective III also has an especially high positive correlation with perspective IV, this will be addressed in detail in the following subchapter.

Summarized, we have found that the entrepreneurships of the sample population have valuable human capital for innovation, and that the entrepreneurships manage these resources well. Human capital is found to be the most important driver for innovation capability in the entrepreneurships.

#### *5.2.5 Management and Internal Processes*

Perspective IV: Management and Internal Processes is represented by innovation variable *InnoLeadProc*. The variable measures how well management and internal processes in the entrepreneurship facilitate for innovation. The average score of this variable was found to be 5.12 with a standard deviation of 0.79. This innovation capability variable has a slightly lower mean than the other three variables in the construct. This is mainly due to an overall slightly lower score on question 15 on the application of operational performance indicators. Perhaps operational performance indicators are used less in a less formalized, non-hierarchical Norwegian business culture? Or perhaps entrepreneurships, small in size, are less prone to use these indicators as it is not necessary in order for the team to keep track of the performance.

Such a high average level entails that the management of the entrepreneurship is well adapted for promoting innovation, via for example contributing to create a positive climate for innovation (Samson & Gloet, 2013; Saunila & Ukko, 2014). Furthermore, the entrepreneurs show that they have adapted internal processes such as idea management (Iddris, 2016), creativity and other soft skills (Robinson & Stubberud, 2014) to contribute to innovation. Finally, although the score on application of operational performance indicators (survey question 15) was slightly lower than the overall scores of the other questions, yet still the overall level was high. This facilitates innovation capability as well as moderating the positive effect of innovation capability on firm performance (Atalay et al., 2013; Blanco-Mesa et al., 2016; Saunila, Pekkola, et al., 2014).

As mentioned in the previous subchapter, a specifically strong positive correlation was found between the innovation variables for perspective III and IV. All the other innovation variables had significant, positive correlations of coefficients of ca 0.4 to 0.5. Perspective III and IV correlate with 0.66, meaning that the exploitation of human capital is heavily dependent on proper management and internal processes in order to contribute to the overall innovation capability of the firm. This might seem obvious, however it is an important finding with managerial implications.

In summary, it has been found that the entrepreneurs of the sample population exert suitable management and internal processes that promote a high innovation capability. Additionally, management and internal processes are especially influential on human capital.

#### *5.2.6 Innovation and Teamwork*

Finally, Perspective V: Innovation and teamwork is measured as a separate variable that is not incorporated in the innovation capability construct. The variable measures to what degree teamwork is used as an arena for work related to innovation. The average score of this variable was found to be 5.26 with a standard deviation of 1.6. Thus, the mean for usage of team as the arena for innovation is high. Note however, that the rather large standard deviation tells us there is more variance in the data for this innovation variable than what have been seen for the other four innovation variables (or for team maturity, for that sake.) Nevertheless, a cumulative percentage of 63.9% report high or very high degree of teamwork for innovation. When including medium, the cumulative percentage rises to 80.3%. Meaning, the bulk of the sample population actively use the team as an arena for innovation.

It has been found that the team is a natural arena for innovation (Edmondson, 2013), and that the team outperforms an individual on innovativeness (Nijstad & De Dreu, 2002). This is partly due to the accumulation of cognitive capabilities (West, 2007). Thus, it is natural to assume that the teams that have a high score on InnoTeam also should have higher scores of innovation capability. When analyzing the data, segment 1 of the sample population, that report none or a low degree of teamwork as an arena for innovation in their entrepreneurship, had an average innovation capability that was 1.19 lower than that of segment 2. Segment 2,

reporting a high or very high usage of teamwork for innovation, is thus found to outperform segment 1 on innovation capability. Meaning, we have found data supporting the theoretical foundation covering this topic, that the entrepreneurial team outperforms the individual entrepreneur in innovation capability.

However, the innovation capability of the team has been found to be strongly moderated by the team dynamics of the team (Dackert et al., 2004; West, 2007). Is there support for this as well in this study? InnoTeam cannot measure team dynamics, it can only measure the degree to which teamwork is applied. Recall however, that according to the theory on team building in practical situations (Sjøvold, 2006a, 2006b, 2007), teams that report a high usage of teamwork for innovation should also have higher team maturity as this should be a suitable teambuilding arena for increasing the entrepreneurial team's team maturity. If we assume that this apply for our data, and that team maturity is a satisfactory measure for team dynamics, we can assess whether there is an effect between the team dynamics and innovation capability as presented in previous literature.

Opposite to the expectations, segment 2 was found to have a very slightly lower team maturity than segment 1! Although the difference of -0.02 is well within the standard deviations (~0.33), and so very slight it is hardly any difference at all, it means that we have not found proof supporting (Sjøvold, 2006a, 2006b, 2007) or West (2007). If disregarding potential errors of method or analysis, this might mean that the entrepreneurial team is affected by other variables which overrule the effect of practical teambuilding for team maturity. Another possibility is that the positive effect of teamwork on innovation that have been found on innovation capability, is affected by other variables than team maturity. Furthermore, a third potential cause is that the UEM might function sub-optimally with regards to team maturity and innovation capability.

When assessing the effect on firm performance, segment 2 slightly outperforms segment 1 by 0.07. Meaning, have been found only a slight increase in firm performance connected with a high application of teamwork for innovation, despite finding that it has a noticeable positive affect on innovation capability. Nonetheless, actively structuring work in teams seems to affect both innovation capability and firm performance positively.

We shall return to the topic of the relationships between team maturity, innovation capability and firm performance in chapter 5.4. For now, note that there has been found significant support for the positive relationship between the team as an arena for innovation and innovation capability.

#### *5.2.7 University Program Influence on Innovation Capability*

Finally, the effect of a University Master's program for Entrepreneurship on the Innovation Capability of the entrepreneurs was measured. Theory has established that such a program should increase the entrepreneurship's innovation capability, through



network effects (Castellacci et al., 2005; Guo & Zhou, 2016; Iddris, 2016; Samson & Gloet, 2013) and other factors such as providing creativity-inducing conditions (Blanco-Mesa et al., 2016).

Table 29 shows that group 1 and 2 had an average of 5.54, ever so slightly outperforming group 3's score of 5.51 by 0.03. However, when looking further into group 1 and 2, group 2 have a lower innovation capability than group 3, as it scores 5.43. Meaning, there was not found any significant differences in innovation capability between the three groups.

Interestingly, the use of teamwork for innovation was slightly lower for the entrepreneurs with university program affiliation (group 1 and 2) than those without which. The first two groups had an average of 5.05, whereas group 3 had a mean score of 5.39. As we have found that InnoTeam affects innovation capability significantly, perhaps InnoTeam overshadows the effect of UEM affiliation on innovation capability.

All in all, the teams that were affiliated to a university master's program did not use the team as an arena for innovation as much as teams without such an affiliation, and there was not found any difference in innovation capability between the three groups. Judging from the results in the previous section, we would expect group 3 to slightly outperform group 1 and 2 in innovation capability, given that group 3 apply teamwork for innovation in a larger degree than the other groups. So far, it can be deduced that no support has been found for hypothesis H5 from the mean analysis.

### 5.3 Firm Performance



Recall that firm performance is measured on five levels, on a scale from 0 (poor) to 4 (very good). The results on firm performance were more varied than those of team maturity and innovation capability, spanning almost the entire scale. With regards to the four financial ratios liquidity, profitability, solidity, and sales growth, there were quite a lot of variation in the data. Especially, there was a distinction between the firms that are in a pre-launch phase, and those who have gained some momentum in sales. As one Marketing Director (ID no. 59592) said: "It is hard for us to put down these numbers, as we have not been in ordinary mode of operation for a year yet." Or as a CEO of another firm (ID no. 58831) put it: "Most Startups have little sales the first few years. The last questions (ed.: questions on firm performance) are therefore difficult to answer." Naturally, this has impact on the ratios, most obviously so sales growth and profitability. Note however that this was adjusted for by adding a factor for the prelaunch state in the results.

Furthermore, depending on area of business, the degree of leverage could also vary, which affects liquidity and solidity. For instance, in a few cases, newly launched web-based entrepreneurs reported that they did not have any debt as their business had not yet

required this. Like one CEO (ID no. 58539) put it: “The company has no turnover, and no short-term debt. We also had a negative result last year.”

All in all, it has been made evident why measuring firm performance is widely considered a tricky business (Atalay et al., 2013; Delen et al., 2013). Although a solid theoretical foundation has been applied to make the construct, according to the suggestions of authors like Murphy et al. (1996), there is no guarantee that this is the best way to measure firm performance in this study or elsewhere. Quite contrary, it has been found that the much-applied method of financial ratios (Delen et al., 2013) might be less purposeful for measuring firm performance in the special case of entrepreneurships as they might not have generated current assets and/or fixed assets in the same way that a more established firm would have.

For instance, the one entrepreneurship that scored 7 - excellent - on innovation capability, is in a pre-launch phase with no current of fixed assets, which gives it only a moderate firm performance, even when adjusted for pre-launch state. Is this score a robust and unquestionable measure of the actual performance of this firm? Perhaps not. Other factors such as the context and market conditions can affect the entrepreneurship firm performance and how it should be assessed relatively to its competitors (Zahra, 1993). In a pre-launch state there is yet uncertainty about the viability of the entrepreneurship’s business plan, and it is a classical investor’s dilemma to assess the (future) performance of the firm (Hellmann & Puri, 2002). Thus, each case needs to be assessed with consideration of all factors which should weigh in on the overall performance evaluation of the firm.

However, although the firm performance data therefore should be assessed with care, it gives us grounds for comparison between the different firms of the sample population. As the four financial ratios gives measures that are distinct, yet related through common factors of current and/or fixed assets, or through relationships where one factor naturally will affect another (e.g. sales growth on profitability), the build-up of the construct should give a comprehensive measure of the firm performance. Furthermore, the inclusion of several indicators should increase the robustness of the construct (Murphy et al., 1996; Vicente et al., 2015). We shall therefore consider the results as applicable for this purpose, and will consider the matter in the limitations of the study later on.

### *5.2.1 Overall Firm Performance Levels*

Out of all the entrepreneurships in the sample population, 9 (14.8%) have the firm performance of 1 – moderate. 24 entrepreneurships (39.3%) had a firm performance of 2 – satisfactory, 21 (34.4%) had 3 – good, and 7 (11.5%) had 4 – very good. Thus, the bulk of the sample population are centered around a satisfactory – good firm performance.

The mean of the whole sample population is ~2, which is equal to a satisfactory level. Considering that these are in fact entrepreneurships more or less in a start-up phase, this is a good result. It is not to expect that young firms have generated large incomes, and many are



heavily dependent on venture capital. Thus, we can derive that most of the entrepreneurships in this study are able to generate income, and quite a few also profits. Furthermore, the level of leverage is evaluated to be at a healthy level, seen as an overall assessment.

Thus, we can derive that most of the entrepreneurships seems to be doing well and are likely to continue to do well in the foreseeable future. This indicates some initial support for H3 as there has been found high team maturity (innovation capability) and firm performance. Next, we shall dive deeper into the different elements of the firm performance construct, and what they each mean.

### *5.2.2 Liquidity*

Liquidity is a measure of how well the business is capable to meet its financial obligations in the short term (Berk & DeMarzo, 2014). Meaning, a high score on this ratio indicates that the entrepreneurship has a healthy relationship between the current assets it holds, to the short-term debt it is obliged to fulfill. The mean score of liquidity was 2.07, a satisfactory level. Thus, in average, the entrepreneurships seem capable to meet their financial obligations.

Although, a standard deviation of 1.28 tells us that there is quite a lot variance in the data, mostly driven by the two reasons mentioned above, pre-launch mode or not and business area differences in leverage. The entrepreneurships which measure below satisfactory on this ratio, are in larger danger of financial distress or even bankruptcy by not being able to meet their financial obligations in the short term. Furthermore, they also are restrained from doing investments that might have helped the business out of financial distress (Cerqueiro & Penas, 2016; Foreman, 2003). This makes liquidity an important indicator of both current and potential future performance of the firm.

### *5.2.3 Profitability*

Profitability is perhaps the most popular firm performance financial ratio. It measures the profit-generating ability of the firm, which indicates whether or not the firm is actually making any money on the business (Murphy et al., 1996). Simply explained, it can be seen as a measure of the entrepreneurships' efficiency (Covin et al., 2006). The mean of profitability was found to be 1.48, with a standard deviation of 1.34. Thus, the mean of this ratio is moderate.

This might be alarming at first sight, as insufficient profitability has been found to be in large degree explanatory of financial distress (Foreman, 2003). However, recall that entrepreneurships are in a special situation. The average profitability will be heavily affected by the entrepreneurships in the sample population that are in a pre-launch phase, with more or less no income. It is also to expect that entrepreneurships have lower sales and profitability than established firms. This is in part explained by the growth-profitability tradeoff, where the

need for growth induce investments and asset expenditure that will lead to lower overall profitability (Zahra, 1993).

All in all, the poor profitability of pre-launch entrepreneurships is not seen as a red flag, as it is a natural state and is likely to change for the positive in the near future. However, the entrepreneurship being heavily leveraged and not succeeding in generating is the typical reason behind many entrepreneurships ending up in financial distress and failing (Foreman, 2003). Thus, for the entrepreneurships in our sample population that are heavily leveraged, obtaining sufficient profitability is extra important. This is also a managerial implication to observe.

#### *5.2.4 Solidity*

Solidity portrays the level of leverage used to finance the firm, which gives an indication of the resilience of the firm (Berk & DeMarzo, 2014; Delen et al., 2013). The mean value for solidity of the sample population is 2.39 (satisfactory), with a standard deviation of 1.46. Notice that this firm performance variable had the best overall score of all four. Meaning, Norwegian entrepreneurships seem to be dependent on leverage to a small degree.

Entrepreneurships are typically limited by restrictions in equity, which necessitates leverage (Dees, 1998). However, as mentioned, certain of the entrepreneurships operate in areas of business that does not require much leverage. This is likely part of the reason why this ratio has obtained a better score, as low leverage is beneficial for the solidity or the entrepreneurship.

All in all, the average then implies that the bulk of the entrepreneurships have a solidity that is satisfactory or better, and are likely to withstand economic losses and fulfill financial obligations in the long term. For the minority of entrepreneurships that have a sub-satisfactory solidity, there is increased risk of financial distress in the long term. Consequently, the pressure for obtaining profitability is increased for these entrepreneurships.

Interestingly enough, the only significant correlation found between the firm performance variables, was between profitability and solidity. The correlation was high and positive, at 0.68. however, as some of the basic elements of the ratios are similar, this makes sense. Looking at the mathematical formulas (1.2 and 1.3), both profitability and solidity have debt in the denominator. Also, the profits incorporated in profitability are different from the equity incorporated in solidity, however the two affect each other and thus may explain some of the correlation. From a logical point of view, one might expect to find a correlation between liquidity and solidity for similar reasons, however the differences in leverage and assets independently of each other of the entrepreneurships might be the reason for why this correlation is not found.

### 5.2.5 Sales Growth

The sales growth indicator gives an indication of how the sales of the firm may develop in the future, judging from the recent development (Murphy et al., 1996). Meaning, it might indicate future revenue and thus have meaning for profitability and overall level of current assets. The mean value for sales growth is 2.11, with a standard deviation of 1.40. Thus, the overall level for sales growth is satisfactory, meaning that most of the entrepreneurships are inducing the growth they may need to sustain and increase profits in the future. This also confirms our initial suspicion of how the growth-profitability dilemma might be part of the reason the mean score of profitability is moderate.

The sales growth can be seen as a measure of the effectiveness of the entrepreneurship (Covin et al., 2006). Thus, by assessing both profitability and sales growth, we have a measure of both efficiency and effectiveness of the entrepreneurship. As the entrepreneurships of the population sample typically have moderate profitability, yet also satisfactory growth, the overall firm performance level from these two performance variables are assessed as satisfactory, based on the profitability-growth dilemma. This also indicates that entrepreneurships are more effective than efficient.

### 5.2.6 University Program Influence on Firm Performance



When assessing the mean firm performance level for the three groups, group 1 has a firm performance of 1.90, group 2 of 2.17, and group 3 of 2.01. All three groups have relatively high standard deviations of approximately 1.1. Group 1 and 2, the entrepreneurships which have an affiliation to a university master's program for entrepreneurship, would then have an average of 2.04. This is slightly higher than group three, yet the difference is not substantial enough to claim there is found evidence that supports out hypothesis H6 that such an affiliation increases firm performance. Moreover, in observing all groups separately, group 1 even has a slightly lower score than group 3.

Nevertheless, all groups are assessed to an average level of satisfactory firm performance. Meaning, there have not been found evidence for that an affiliation to a university Master's program for entrepreneurship affects the firm performance of the entrepreneurship, i.e. no support has been found for H6. Quite interestingly, this is in line with several previous studies that have evaluated university entrepreneurship programs which have found that these programs have not lead to increased entrepreneurial performance (Oosterbeek, Van Praag, & Ijsselstein, 2010; Rideout & Gray, 2013). Other studies find more mixed results (Von Graevenitz, Harhoff, & Weber, 2010), and it is evident that there is a need for more systematic evaluation of the outcome of such entrepreneurship education programs (Duval-Couetil, 2013).

All in all, the means analysis has shown some initial support for H1, H2, and H3, yet no support for RQ2. Table 48 summarizes this.

Table 48 - Results from Mean Analysis

<b>Research Question</b>	<b>Hypothesis</b>	<b>Support</b>
RQ1	H1, H2, H3	Yes
RQ2	H4, H5, H6	No

5.4 Is there a Connection? The relationship between team maturity, innovation capability, and firm performance

So far, we have explored the results on team maturity, innovation capability, and firm performance separately. We have constructed an understanding of each of these elements, and the hypotheses H4, H5, and H6 connected to research question RQ2 has been addressed. Some initial support for H1, H2 and H3 has been identified. Now, the relationship between the three variables shall be addressed in further detail.

5.4.1 Correlation Analysis with a Mini-Case Study

As the empirical findings of chapter 5.4.1 shows, there was not found any significant correlation between team maturity, innovation capability, and firm performance. Thus, at first glimpse, our hypotheses H1-H3 and RQ1 seems to be debunked. No correlation was found for group number either, also refuting H4-H6 and RQ2. The difference in team maturity, innovation capability, and firm performance might be driven by other variables, but not by a relationship internally between themselves according to this method.

This is counterintuitive when considering the results of the means analysis, which indicated support for H1-H3. Moreover, it is counterintuitive also when considering the theoretical foundation of the study. For example, the teams that have a team maturity of production, which is a higher team maturity than team spirit, were expected to have higher problem-solving skills and team dynamics, which would render the team better equipped to work innovatively. However, perhaps since neither production or team spirit are team maturity levels where the team is able to face a disruptively changing context (Sjøvold, 2006a, 2007, 2014), none of the entrepreneurial teams have the team dynamics necessary for being truly innovative? Recall that the innovation capability level of the entrepreneurial teams were for the most part on a high level, however almost none were at an excellent level. How about the one team that was?

ID number 58539 obtained a 7 – the highest score – for innovation capabilities, as the only one. Both operating as a product and service company, the entrepreneurship is still in a pre-launch phase, currently focusing on technology development according to the CEO. As the entrepreneurship is pre-launch without substantial debt or income, it is hard to assess the firm performance based on (partly intangible) assets only. The CEO informed that the firm is mainly funded by venture capital from Innovation Norway, and private equity. However, what about the team maturity? The entrepreneurship has reported that teamwork is extremely important for their innovative work, and is very much applied as an arena for innovation. The team maturity of the team however, was assessed to production. Meaning, although the team is actively working with innovation in the team, which provides practical team building (Sjøvold, 2006a, 2007, 2014), the team does not have the highest team maturity, innovation which one might had expected it to have. Nonetheless, not having the highest team maturity still allows for the team to have great innovation capability.

Perhaps is this linked with the entrepreneurship being pre-launch? By having a team maturity of production the entrepreneurial team is able to solve complex tasks, which is a central element for innovation capability (Ancona & Bresman, 2006; Castellacci et al., 2005). However, it is not able to meet a disruptively changing context, which means it has limited abilities in this direction which would likely limit its innovativeness. Nevertheless, as the entrepreneurship has not yet launched in the market, perhaps it has not yet had to face its context in full, and thus this has not been hindered the team. To study the credibility of these theories, one would have had to follow the entrepreneurship in a longitudinal study following them into a launch phase and as the company matured over time.

On another note, although external partners and customer and market feedback is deemed extremely important for the business and how innovative the entrepreneurship must be, there is little feedback that directly contributes to the innovation itself (CEO). The team is part of group 1, meaning that it has affiliation to a University Master's program for entrepreneurship. This is very interesting to note, as it might offer an explanation as to why H5 was debunked. Meaning, although it is valued by the entrepreneurship to be in such a network, as literature has found too (Castellacci et al., 2005; Lechner & Leyronas, 2009), it might not have a direct effect on the innovativeness of the entrepreneurship. Likely, other variables are at play that have larger impact on the innovativeness of the team than the impact from the network.

Thus, the mini-case of the interesting entrepreneurship who single-handedly have scored the highest level of innovation capability, might have helped us understand in part why H5, and in extent RQ2, was debunked. However, little hand fast other than theories can be derived to understand the causes of why RQ1 had been refuted. Based on the combination of previous theory, we expected higher team maturity to lead to higher innovation capabilities (Dackert et al., 2004; West & Anderson, 1996), higher innovation capability to lead to higher firm performance (Audretsch, 2012; Castellacci et al., 2005; Fagerberg & Verspagen, 2009; Galindo & Méndez-Picazo, 2013; Galindo & Méndez, 2014), and higher team maturity to lead to higher

firm performance through better entrepreneurial team performance (Sjøvold, 2006a, 2007, 2014), moderated via innovation capability. The correlation analysis has not found any support for this, in contrast to what the mean analysis indicated (see Table 49). How about the cluster analysis?

*Table 49 - Results of Correlation Analysis*

<b>Research question</b>	<b>Hypotheses</b>	<b>Support</b>
RQ1	H1, H2, H3	No
RQ2	H4, H5, H6	No

#### *5.4.2 Cluster Analysis*

By running a cluster analysis, the hope was to find whether there existed subgroups in the data set which had distinct qualities with regards to team maturity, innovation capability, and firm performance. A clustering variable was also included for groups 1 to 3 to see if the affiliation to a University Master’s program for entrepreneurship would have any impact in this type of analysis, to “waterproof” or contest our initial refute of RQ2.

There were six cluster analyses which produced clusters of good quality (no. 1, 8, 9, 11, 12, and 15 in Table 40). Our initial refute of RQ2 based on the correlation analysis is supported by the cluster analysis too, as no effect was found for group number on team maturity, innovation capability, nor firm performances. Moreover, the ANOVA analyses of these six different cluster groupings lead to very similar results; only minor differences in mean team maturity, innovation capability, and/or firm performance were identified. Nevertheless, to a certain degree, some support of H1 of RQ1 was found.

The exception for H1 found support in the ANOVA-results from two of the clusterings. To explore this in detail, a detailed discussion of the results and implications of the results is presented for each of the six clustering. Then, to derive the main deductions, a more higher level-discussion of the implications of the findings of the cluster analyses is presented.

In clustering number 1, based only on team maturity as a clustering variable, produced a cluster of entrepreneurships with team maturity 3 – production, and one cluster of team maturity 2 – team spirit. For the first cluster, the innovation capability rounded off gives it an innovation capability of 6 – very good. Whereas the second cluster, slightly below cluster one, gives one level lower in innovation capability, 5 – very good. Meaning, here we find (slight) support for hypothesis H1, that higher team maturity leads to higher innovation capability. Both clusters are evaluated to very good innovation capability, however there is a difference of a whole innovation capability level when rounded off. Note that no difference in firm performance level was found between the two clusters, both clusters being assessed to 2 – satisfactory firm performance. Interestingly, cluster one had mostly entrepreneurships

belonging to group 1 or 2 in it, whereas cluster two had mostly entrepreneurship from group 3. Meaning, to some extent our hypotheses H4 and H5 are here refuted, as the tendency therefore is that having an affiliation to the University Master's program for entrepreneurship actually lowers team maturity and innovation capability. For now, caution is exerted and instead of stating we have found a new relationship we simply observe that support has been found for H1 in RQ1, and slight support have been found to refute H4 and H5 in RQ2. No support is found for H2, H3 or H6.

Clustering number 8 was based on the clustering variables firm performance and group number. Two clusters were produced, cluster 1 was comprised of mostly entrepreneurship of group 1, cluster 2 entirely from group 3. Both clusters had identical firm performances, satisfactory. They also had the same team maturity level, team spirit. The same difference in innovation capability was observed between the clusters as in clustering 1: cluster 1 had very good innovation capability, and cluster 2 had good innovation capability. This is interesting – it shows support for H5, that an affiliation to an UEM increases innovation capability. However, considering the potential weaknesses of the cluster analysis with a small sample population (Ketchen Jr & Shook, 1996; Mooi & Sarstedt, 2010), we consider the support with frugality and only hold it for slight support of H5.

Clustering number 9 was based on the clustering variable group number, which produced three clusters for each of the three groups, quite logically. As we have found before, this gave no impact on neither team maturity nor firm performance, contributing to the refuting of H4 and H6. However, there was a slight difference in innovation capability, where cluster 1 and 3 (group 3 and 2) had very good innovation capability whereas cluster 2 (group 1) had good innovation capability. This offers no support for RQ2 however, as the results on innovation capability seem unrelated to the affiliation to an UEM as group 3 and 2 have the same innovation capability result. Thus again, we find further support for refuting H5 of RQ2, and no support for H4 and H6.

Clustering number 11 uses the clustering variables team maturity and group number. There were four clusters produced. Cluster number 1 and 2 had a team maturity level of production, cluster number 3 and 4 of team spirit. The production clusters had very good innovation capabilities, and the team spirit clusters had good innovation capability. Meaning, similarly to clustering number 1, there is found slight support for H1, that higher team maturity leads to higher innovation capability. Group number effect vary without a pattern for team maturity and innovation capability levels, here group 1 and 3 have higher results on team maturity and innovation capability than group 2. There is not found support for H2, H3, or any of the hypotheses of RQ2.

Clustering number 12 uses team maturity, firm performance, and group number as clustering variables. Two clusters are produced. Both clusters have team maturity level team spirit and satisfactory firm performance. Cluster 1 is comprised mostly of entrepreneurship in group 1, cluster 2 in whole of entrepreneurship from group 3. Both clusters have team maturity

production and satisfactory firm performance. Cluster 1 has slightly higher innovation capability (very good) than cluster 2 (good). This is interesting as it in contrast to clustering 1 and 11 it does not show any support for H1. Meaning RQ1 is not supported. H5 in RQ 2 however, find slight support, just like in clustering number 8.

The final clustering with good cluster quality, number 15, was based on the clustering variables team maturity and firm performance. Two clusters were produced. Both clusters had a mean team maturity level of production, and satisfactory firm performance. Cluster 1 is comprised of mostly entrepreneurships from group 1, cluster 2 in whole from group 3 – just like the clusters in clustering 8 and 12. And just like clustering 1, 8, and 12, the same difference in innovation capability is found. Cluster 1 has very good innovation capability, whereas cluster 2 has good innovation capability. Meaning, no support is found for RQ1. However, the same pattern as in clustering 8 and 12 is found, i.e. slight support for H5.

Table 50 summarizes the deductions drawn from the cluster analysis.

*Table 50 – Summarized Findings from Cluster Analysis*

<b>Clustering</b>	<b>RQ1</b>	<b>RQ2</b>
1	Slight support for H1. No support for H2 or H3.	Slight support for refutation of H4 and H5. No support for H6.
8	No support	Slight support for H5. No support for H4 or H6.
9	No support	Slight support for refutation of H5. No support for H4 or H6.
11	Slight support for H1. No support for H2 or H3.	Slight support for refutation of H5. No support for H4 or H6.
12	No support.	Slight support for H5. No support for H4 or H6.
15	No support	Slight support for H5. No support for H4 or H6.

Overall, we see that the results found in the cluster analyses are partly in accord with the previous analysis and discussion. There has not been found any support for hypotheses H2, H3, H4, or H6. However, when it comes to hypothesis H5, the findings are more mixed. The results of the cluster analysis are contradictory, offering both support for and against H5, three clusterings supporting H5 and three clusterings contradicting H5. In sum, the results from the



cluster analysis for H5 are considered too contradictory to be trustworthy. This is an excellent example of why caution must be exerted when applying cluster analysis. As for H1, both clustering 1 and clustering 11 supports it. Meaning, in accord with the mean analysis and in contrast to the correlation analysis, the cluster analysis has to a certain degree produced support for H1. Table 51 summarizes the findings from the cluster analysis.

*Table 51 - Results of Cluster Analysis*

<b>Research question</b>	<b>Hypotheses</b>	<b>Support</b>
<i>RQ1</i>	H1	Yes
	H2, H3	No
<i>RQ2</i>	H4, H5, H6	No

It is obvious that all the desired results are not produced from analyzing the team maturity, innovation capability and firm performance variables as whole entities. The cluster analysis has shown that there might be patterns that the rough correlation analysis between team maturity, innovation capability, and firm performance cannot detect. Therefore, it is necessary to go into further detail in the analysis to derive useful information. Although we might have to refute most of the original hypotheses, we might find elements of the variables that are interesting to consider.

*5.4.3 Correlation Analysis between Elements of Team Maturity, Innovation Capability, and Firm Performance*

A detailed correlation analysis of the individual elements behind each of the three variables team maturity, innovation capability, and firm performance, as well as group number, area of operation, and teamwork for innovation was performed. See Appendix 10 for the whole analysis, Table 41 for the significant correlations. Each of the underlying innovation variables and firm performance variables that is incorporated in the constructs for innovation capability and firm performance were analyzed separately. As team maturity is one single variable, it was included as it has been used before.

Interesting patterns emerge immediately. Although most of the variables have no significant correlation, several do. In specific, 9 significantly correlating relationships were found, 4 of which supporting part of RQ1 to varying degree. See Table 52 for a summarizing visualization of the correlations. These correlating relationships will be discussed in detail in the two subsequent subchapters. No support for RQ2 was found, as there were found no significant correlations with group number. The 5 remaining correlations are internally between

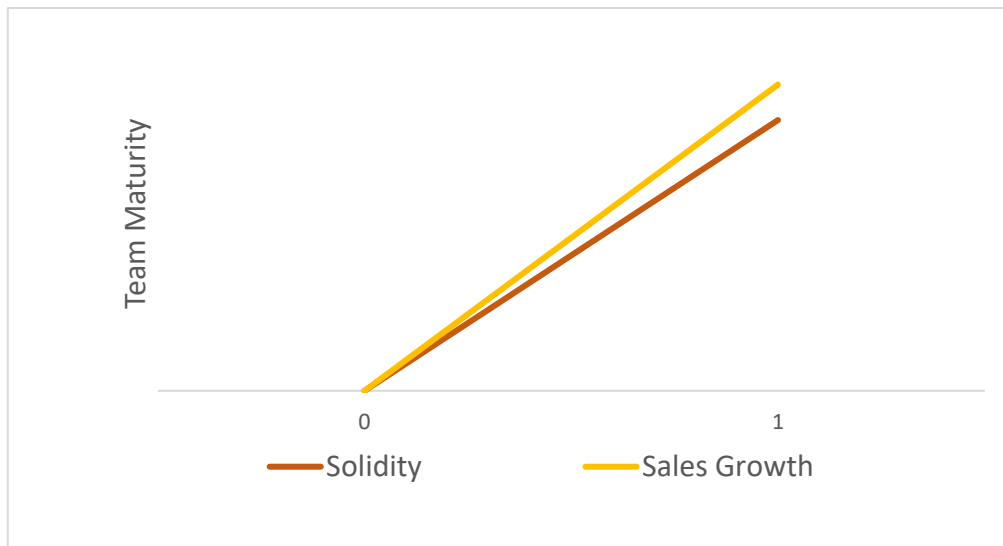
innovation capability variables or firm performance variables, respectively, and have already been discussed in ch. 5.2 and 5.3 and will therefore not be discussed further.

Table 52 - Detailed Correlation Analysis

<b>Variable</b>	<b>Correlates with variable/Q</b>	<b>Q is part of Variable</b>
<i>Team Maturity</i>	Solidity	-
	Sales Growth	-
<i>Teamwork for Innovation</i>	Individual competence and knowledge	InnoCompStrat
	Innovation strategy	
	Innovation leadership	InnoLeadProc
	Innovation processes	
	Change management and risk willingness	
	Creativity	

5.3.4 Correlations between Team Maturity and Solidity and Sales Growth

First, team maturity correlates positively with solidity by 0.61 and with sales growth by 0.69. See Figure 14 for a visualization of the correlations. Thus, in part, hypothesis H3 is supported. I.e. a link between team maturity and certain indicators of firm performance has been found. It does not fully support our hypothesis, but offers support for that there is something in the hypothesis that holds. Furthermore, that there has also been found a correlation between innovation capability variables and teamwork for innovation, suggests that the triad team maturity, innovation capability, and firm performance might hold several forms of relationships somewhat similar to the ones this study has addressed. That these two specific firm performance indicators (and not the other two that take part in the construct) correlate with team maturity can seem somewhat random. Recall that solidity reflects an indication of resilience, and sales growth future developments for the entrepreneurship. Why exactly these two indicators?



*Figure 14 - Team maturity - Solidity/Sales Growth Correlations*

Sales growth can be very high even if sales in absolute numbers are moderate, given that the starting point can have been very low in sales, which probably explains for some of the correlation there. High sales growth is typical during a product growth phase (Vernon, 1979). Furthermore, high sales do not equal profits, especially in an early phase where sale prices might be moderate and product/service development might be costly. This is why sales growth might correlate whereas profitability does not.

Solidity might seem tougher to try to understand. Recall that a high solidity means that the degree of leverage is moderate. As many of the entrepreneurs might have invested private equity in their entrepreneurship this might explain some of the correlation. Higher degree of private equity in the entrepreneurship's capital structure means lower degree of leverage, i.e. higher solidity. Recall that this is for example what the CEO of our mini-case study (ID number 58539) said: "Private equity is one of two main sources of funding for the entrepreneurship". In fact, the financial structure being dominated by private equity is quite typical in an early stage for many startups (Scherr, Sugrue, & Ward, 1993). Moreover, if the team maturity is high, both trust in, and sense of belonging to the team increases (Sjøvold, 2006a, 2007, 2014). This is likely to increase the members of the entrepreneurial team's faith in the entrepreneurship, thus increasing the willingness to invest private equity. Perhaps is therefore solidity in the context of this study a measure of faith in the entrepreneurship, driven by high team maturity?

Probably, the same relationship is not found for liquidity and profitability simply because many of the entrepreneurship have not yet started to accumulate substantial assets and/or equity. There can also be other, external forces at play that control these financial ratios that overrules the effect of the performance of the team on the firm performance. Considering the four stages of product life-cycle theory, as first introduced by Vernon (1979), the product will typically not generate (substantial) profits in the introduction and growth-phase. Most of the

entrepreneurships in the survey are in one of these two phases, and several have not even reached introduction as they are still pre-launch. This suggests that the cause for no correlation with profitability might be caused by the simple fact that the entrepreneurship is in an introduction or growth phase.

Moreover, as we have found that the entrepreneurships are typically funded in large degree by private equity, it is very interesting to note that there has been found a positive relationship between physical assets and leverage (Mann & Sanyal, 2010). Meaning, the fact that many of the entrepreneurships have a low degree of leverage (high solidity), might also mean that they have less assets, explaining why no correlation was found for liquidity. Thus, following these lines of thought, several potential causes to why the same correlation is not found for profitability and liquidity are identified.

With these considerations in mind, this detailed correlation provides support for hypothesis H3, that high team maturity leads to high firm performance.

5.3.5 Correlations between Teamwork for Innovation and InnoCompStrat and InnoLeadProc

Secondly, teamwork for innovation correlates positively with InnoCompStrat by 0.70 and with InnoLeadProc by 0.75. See Figure 15 for a visualization of the correlations. Although this is not directly linked specifically to team maturity and thus cannot be said to provide support to H1 per se, this finding does support the importance of teamwork for innovation. The finding supports the supposition that H1 is built upon, that (well-functioning) teams outperforms individuals on innovation capability. Based on theory, it seems quite logical that these correlations are found, as previous literature draw lines between teamwork and increased innovativeness (Edmondson, 2013; West & Anderson, 1996). Now, what exactly is it that drives these correlations?

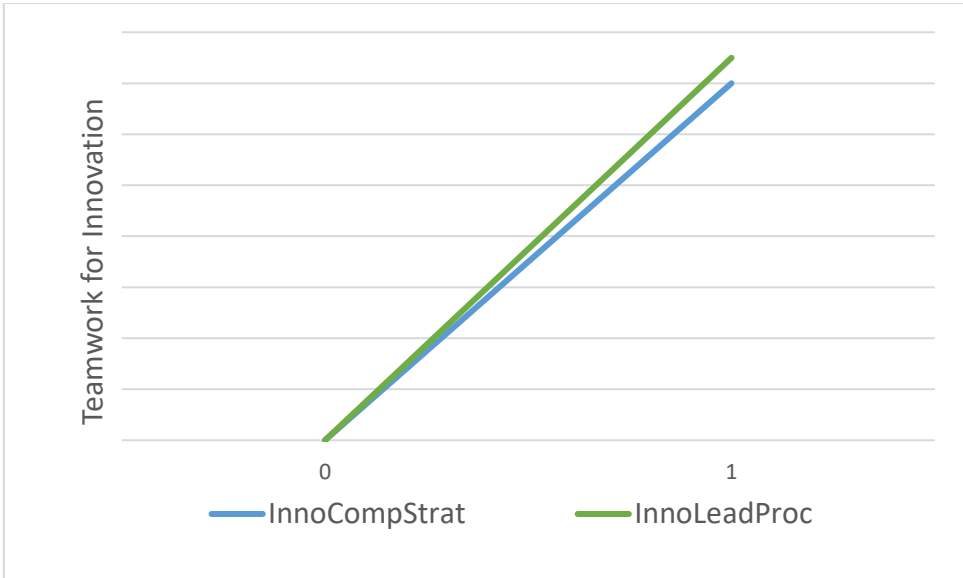


Figure 15 - Correlations between Teamwork for Innovation and InnoCompStrat/InnoLeadProc

When examining the underlying elements of InnoCompStrat, two elements have a significant correlation with teamwork for innovation. Figure 16 presents a visualization of this, notice the color scheme from previous figure 15 representing InnoCompStrat in blue is continued.

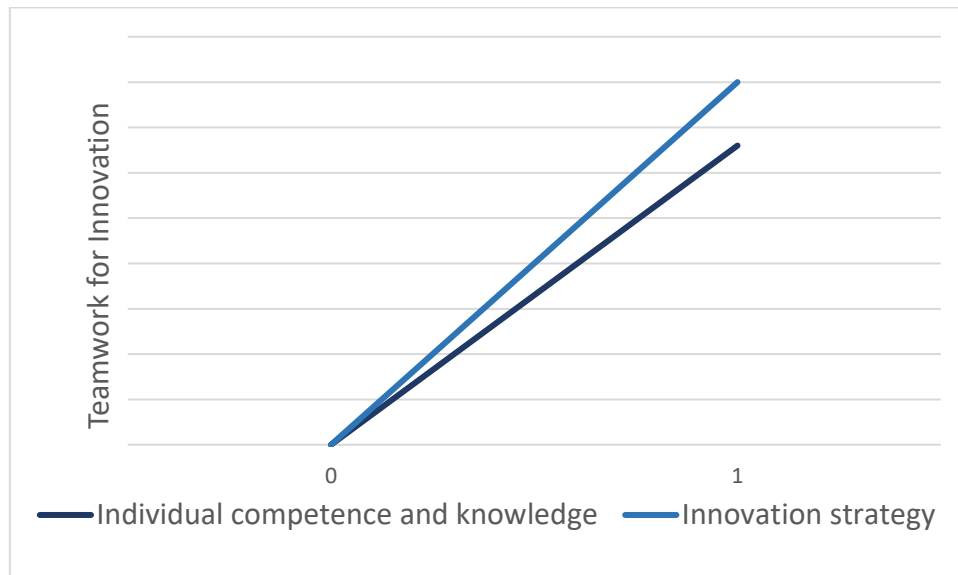


Figure 16 - Correlations between Teamwork for Innovation and Elements of InnoCompStrat

Firstly, Q 5 Individual knowledge and competence correlate positively with InnoCompStrat by 0.33. Meaning, it seems that the entrepreneurs that actively work in teams on innovation also have higher levels of valuable individual knowledge and competence in the entrepreneurship. Determining causality is here a chicken and egg-problem, for which the answer may vary for each separate entrepreneurial team. However, it can seem likely that teaming up also boosts the sharing of competence and knowledge, thus increasing the overall competence level in the team. This corresponds well with previous studies, finding that teams are an arena that facilitates learning (Dackert et al., 2004; Edmondson, 2012, 2013), e.g. increase in competence and knowledge.

Secondly, Q6 Innovation strategy correlates positively with teamwork for innovation by 0.40. Thus, it is found that entrepreneurs that use teaming actively also score well on strategies that promote innovation. Perhaps, there is a connection via that part of such a strategy is managing creativity- and idea generating processes (Hogan & Coote, 2014), and that it has been found that the team is an excellent arena for exactly creativity and idea generation which boosts innovation capability (Chen, 2007). Meaning, that the connection between teaming up and innovation capability with regards to innovation strategy that has been found in this study might be explained by that such strategy, when focusing on creativity and idea-generation, will boost the use of teamwork. This is an excellent example of the ambiguousness of causality in much social research: which factor effects which? In which order and direction? In this case,

although teaming up helps innovation capability, it might as well be a good innovation capability at work boosting the use of teamwork. Thus, there might be feedback effect behind the correlation between teamwork for innovation and innovation strategy.

When examining the underlying elements Q of InnoLeadProc, four underlying elements correlate positively with teamwork for innovation: Q11 Innovation leadership by 0.46, Q12 Innovation processes by 0.26, Q13 Change management and risk willingness by 0.33, and finally Q14 Creativity by 0.52. See figure 17 for a visualization of the correlations, notice the green color theme being continued from Figure 15 for InnoLeadProc.

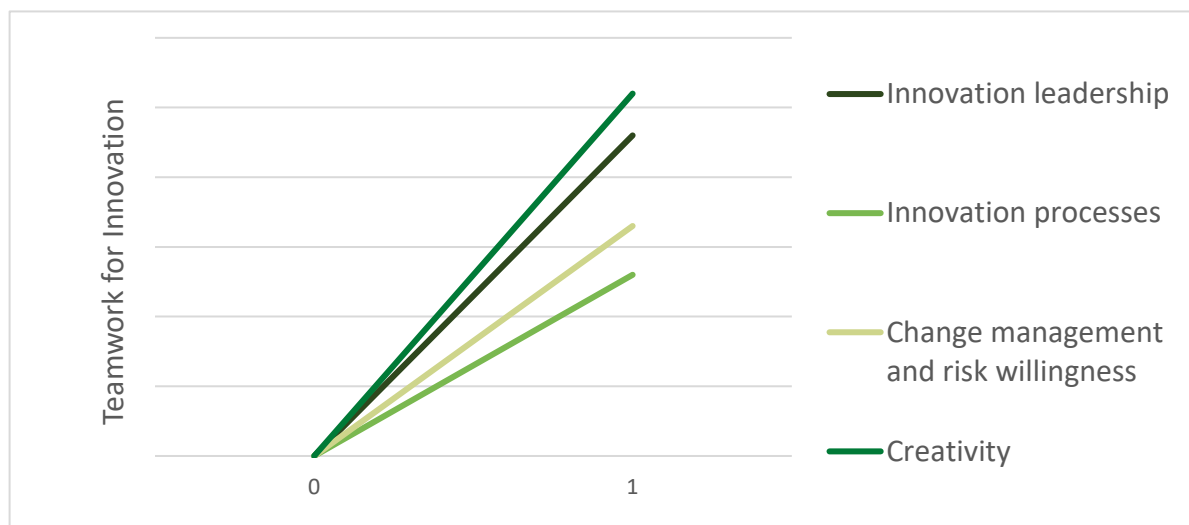


Figure 17 - Correlations between Teamwork for Innovation and Elements of InnoLeadProc

Creativity is already discussed by that it can likely be explained by the logic explained in the paragraph covering innovation strategy. Good leadership is identified as one of the central drivers of innovation (Saunila, Ukko, et al., 2014), and it has found that for innovation, leadership is best exerted as incorporated in a team (Bel, 2010; Dackert et al., 2004). Thus, it seems logical that the entrepreneurships that work the most in teams also score high on leadership-driven innovation capability, as it is more likely that leadership is incorporated in the entrepreneurial teams in these entrepreneurships.

Innovation processes is also shortly mentioned above. Part of important processes for innovation capability is managing creativity and idea-generation (Saunila & Ukko, 2014). And we have determined that the team is a natural venue for creativity (Chen, 2007). Thus, creativity might be the link between teamwork for innovation and innovation processes in the entrepreneurships.

Finally, change management and risk willingness is extremely important to entrepreneurships as most operate in a changing context that pose high demands on innovation capability (Iddris, 2016). The entrepreneurships that score high on teamwork for innovation probably also do so

for change management and risk willingness, which theory has found is central for innovation capability (Assink, 2006; Tushman, 1997). Moreover, reducing risk-adversity through creating an environment of trial-and-error can be obtained through a team where the members share high psychological safety (Altman et al., 2014; Edmondson, 2013; Saunila & Ukko, 2014). Thus, this implies that teamwork might be correlating with change management and risk willingness because the team is a purposeful tool for just this purpose.

Table 53 shows the summarized results of the detailed correlation analysis.

*Table 53 - Results of Detailed Correlation Analysis*

<b>Research question</b>	<b>Hypotheses</b>	<b>Support</b>
RQ1	H1	No/indirectly via InnoTeam
	H2	No
	H3	Yes
RQ2	H4, H5, H6	No

## 5.5 Case Study



We have discussed a mini-case in ch. 5.4.1 in connection with looking further into the details of the interesting single entrepreneurship which was found to have excellent innovation capabilities. Now, we shall discuss the main case study of this thesis. The ample material we have on the details of the case study will hopefully help in gaining better insight in several of the matters that have come up previously in the discussion, which can benefit from further analysis.

### 5.5.1 Case Study Team Maturity



The case study entrepreneurship has a production team maturity level. This means that the maturity level is high enough to tackle complex tasks, yet only incremental changes in context (Sjøvold, 2006a, 2006b, 2007). The assessment of this maturity level is based on the results on dimensions and vectors N1 to S2, based on the SPGR-algorithm. Perhaps looking into the individual dimensions and vectors can explain more about the entrepreneurship? It is especially interesting to direct our attention to the outlier scores.

In the positive end of the scale, the N1-C1 dimension and the W2 vector scored both a maximum (4) contribution to team maturity. Meaning, N1-C1 has a difference of 0, which means there is a very balanced relationship between N1 caring and C1 ruling. This corresponds well with theory, which underlines the importance of psychological safety in teams for

performance (Edmondson, 2012), and it is simultaneously important to have structure through leadership and procedures in order to be productive (Crumpton, 2012; Dackert et al., 2004; Samson & Gloet, 2013). At this point in specific, the entrepreneurship seems very capable. Secondly, the W2 vector is very low, meaning the perceived degree of “self-sacrifice” with passive and reluctant behavior is very low. Naturally, this is a positive contribution to the team’s performance as it indicates an active participation and shared commitment in the team. This also corresponds well with what the technical interviewee expressed, that individual initiative in the team was important for the entrepreneurship.

In the negative end of the scale, the N2-C2 dimension scores very low, actually the minimum (1). This means there is an imbalance between N2 creativity and C2 task orientation. In specific, there is an overweight of task orientation, whereas creativity is scarce. This might lead to productivity but take a toll on idea-generation and product development. The team might be efficient this way; however, it is also in danger of becoming creatively static and will most likely struggle to perform on a high level over time. In fact, the low score on creativity is a very interesting point, as innovation literature again and again underlines the critical importance of creativity as one of the fundamental sources of innovation (Ancona & Bresman, 2006; De Dreu, 2006; Thompson & Choi, 2006). Meaning, the low level of creativity should affect both team maturity and innovation capability negatively.

### 5.5.2 Case Study Innovation Capability



Continuing that line of thought, what did the entrepreneurship score on creativity for innovation? The overall score was three out of seven. This is the element which also causes the innovation capability variable InnoLeadProc to pull the average innovation capability down. Meaning, creativity is assessed to a quite low level also in the context of innovation capability. Thus, there is consistency between the data. It is very interesting to note that innovativeness and idea generation is underlined as essential for the entrepreneurship in the interview with the business interviewee. However, recall that neither of the interviewees characterized their work as especially innovative. Perhaps there is a connection here?

As the entrepreneurship obtains an innovation capability score of 5.12 – meaning that they have a very good innovation capability, it seems evident that innovation is key for the firm to do well and that it has the required prerequisites to generate the necessary innovation. So why do they not think of themselves as neither especially creative or as producing innovations?

Either the employees are underestimating the true innovation capability of the entrepreneurship, or the measured innovation capability does not represent how innovative the entrepreneurship truly is. Given that we assume the measured innovation capability, based on literature and carefully composed, reflects the true innovation capability for the entrepreneurship, what can the potential causes be? Although a common belief is that individuals tends to overestimate own performance in self-assessments, it is actually found



that the opposite is more common (Moore & Cain, 2007). However, this often depends on the level of performance. The novice and underperformer often overestimates own performance, whereas the expert tends to be much more aware of own limitations (Boud & Falchikov, 1989; Kruger & Dunning, 1999). In fact, top performers typically underestimate own performance (Schlösser, Dunning, Johnson, & Kruger, 2013). Thus, as the case study entrepreneurship is over average and a “top performer” compared to the whole sample population, it seems that an underestimation of own innovativeness might be the cause of the gap in the interviewee evaluation and the quantitative evaluation of innovation capability.

The innovation capability variable InnoCompStrat is also slightly below the overall innovation capability score for the entrepreneurship. There is only a slight difference, however it is driven by one very different response on one element in InnoCompStrat; innovation strategy. Here, the reported levels vary greatly between the respondents. This might indicate under-communication of the entrepreneurship strategy. After interviews and observations, there is an impression that the strategy is developed mainly centrally in the entrepreneurship. Meaning, not all of the entrepreneurship’s employees might be fully onboard on or even aware of the complete content of the strategy. In fact, it has been found that this is an extremely normal phenomenon; that strategy is under-communicated to all areas of a firm (Sull, Homkes, & Sull, 2015).

Thus, this might be a sub-optimal situation, yet perhaps not affect the actual performance of the entrepreneurship in large degree. For instance, the interviewees both expressed the ability of the entrepreneurship to operate in an agile way and adapt their strategy in response of contextual changes. Sull et al. (2015) recommend a redefinition of strategy in terms of seizing strategically important opportunities after an extensive, longitudinal study that debunked many myths on strategy. Notice the similarity to definitions of innovation as opportunity exploration and exploitation (Ancona & Bresman, 2006; Castellacci et al., 2005; Fagerberg, 2006b). Thus, the ability of the entrepreneurship to seize important strategic opportunities might be more beneficial compared to a strongly communicated, yet inflexible strategy in terms of innovation capability.

On the other hand, InnoProdProc and InnoHR are both pulling the average up, having very good scores. Meaning, the entrepreneurship has very good innovation capability in connection to their main business area, and internal processes. Furthermore, it has valuable internal resources in terms of human capital, which is well managed so that it can contribute to innovation.

All in all, high levels of both team maturity and innovation capability are so far suggesting support for H1.

### 5.5.3 Case Study Firm Performance



The firm performance is higher than the average of the sample population, being assessed to a good level (3). If assuming that the sample population is a representative selection for Norwegian entrepreneurship in general, the case study entrepreneurship is a top performer entrepreneurship. This is in accord with diverse acknowledgements that the entrepreneurship has received for excellence, and the high hopes many holds for the future of the firm.

To go further into detail on the firm performance, solidity is very good (4), meaning the entrepreneurship is resilient by having a low degree of leverage. This is partly related to that the business area it operates in does not require substantial investments in fixed assets, the need for leverage has been limited. Moreover, as the entrepreneurship has been in business with sales for a handful of years now, its products have grown and might be getting nearer to a mature stage. Furthermore, its wide acknowledgement builds investor trust and interest. This means that the firm has increased accessibility to accumulate equity, lowering the need for leverage.

Profitability is evaluated to a good level (3). Recall that profitability is generated by the relationship between income and costs, adjusted for capital costs. It might in part be explained by what is stated above, that its core business products are approaching maturity, which is when profitability typically is obtained in a product life cycle (Vernon, 1979). Furthermore, a certain extent of a customer base has been founded, with big-project, long-term customers. These two factors are contributing to profitability through income. What about costs? Firstly, the establishment of a more mature product base means that development costs to these products can be reduced or near eliminated. Furthermore, the business area the entrepreneurship operates in does not generate large fixed costs as e.g. the necessity of fixed assets is moderate. Finally, the entrepreneurship has been very active in partnering up with resourceful partners. Recall that the absorption and exploitation of external resources has been found imperative for the performance of innovative entrepreneurships (Franco & Haase, 2013; Iddris, 2016; Stam & Elfring, 2008). Here, the partners offer strategic alliances that spare the entrepreneurship for expenses for (part-solution) product development and certain costs connected with customer support.

On the other hand, liquidity and sales growth are both pulling down the overall firm performance, being only satisfactory (2). Why is this? First of all, it is important not to confuse a slightly lower score relative to the other firm performance indicators with a *bad* score. The firm performance of these indicators is at a very acceptable level, being satisfactory. Nevertheless, the slightly lower score on liquidity might be explained by that rather than accumulating current assets which would increase liquidity, free resources are rather poured back into the business. For instance, development of new add-ons, expansions to current products, or entirely new products, might be such a purpose. Furthermore, the business is in growth in terms of size, which also requires resource allocation.

Talking of growth, sales growth might be satisfactory as the firm has more mature products, who might be in a less active part of the growth-phase in the product life-cycle, or even in a transition phase towards product maturity. Furthermore, the entrepreneurship is in a phase exploring potential new markets and other opportunities, meaning that they have not currently a newly launched product which would be likely to generate an increase in growth.

In summary, the overall performance level of the entrepreneurship is good, making it a top performer among its peers. The main reasons that are identified behind this is partly that the entrepreneurship has established a product base and customer base which generate profits and make a relatively solid foundation for an entrepreneurship. Furthermore, the business plan is designed in a way which allows for moderate capital costs and other costs. Thirdly, an agile way of operation, while exploring and exploiting internal and external resources also contribute to maintain high performance over time.

Summarized, the findings so far indicate support for H2 and H3, as team maturity, innovation capability, and firm performance levels have all been found to be high.

#### *5.5.4 Case Study support for RQ1 and RQ2*

Now, how do the findings regarding the case study relate to the research questions? Overall, RQ1 Seems to be supported by the findings in the case study with regards to all three hypotheses H1-H3.

H1 is supported by that high team maturity is observed in company with a very good innovation capability. Several elements are contributing to high team maturity, which also boost innovation capability. For example, a balanced relationship between intra-team trust and structured leadership and processes was found, in addition to high involvement and shared accountability. The balanced relationship between intra-team trust and structured leadership and processes, in combination with high involvement and shared mutual accountability are factors which both boosts team maturity, but also is found to be important for innovation capability by several authors such as Edmondson (2013) (trust/psychological safety), Saunila and Ukko (2014) (structured leadership and processes), Schjoedt and Kraus (2009) (involvement), and Mendibil and MacBryde (2005) (mutual accountability).

Furthermore, H2 is also supported, as both very good innovation capabilities and good firm performance is observed. The firm performance is in large part driven by innovativeness, which is expressed as fundamental for the competitiveness and success of the firm by in the qualitative interviews. The innovation capabilities of the firm form the foundation from which its unique product base has been developed in-house, which is what currently generates profits for the firm. Furthermore, the innovative capabilities of the firm extend to exploring and exploiting external resources and taking advantage of strategic opportunities, which helps maintain the good firm performance. Thus, there are identified several elements that suggest support for H2 from the case study.

Regarding H3, it seems to have found support from the case study as well. H3 is here supported in that both high team maturity and good firm performance is observed. For the case study is seems confirmed that the well-functioning entrepreneurial team is in large degree the foundation for the entrepreneurship’s top tier-performance. Furthermore, we have seen that innovation capability is extremely important for the performance of the firm. The team maturity is valuable for the firm in large part because it boosts valuable innovation capability. Thus, the team maturity is to a large degree positively contributing to firm performance by the degree it can boost innovation capability. Therefore, we argue that support has been found for H3, that high team maturity increases firm performance, and that this relationship is moderated by innovation capability.

As to RQ2, this is harder to assess. Recall that the case study entrepreneurship has an affiliation to University academia, however it is not issued from a University Entrepreneurship Master’s program. Therefore, it is hard to interpret the results as fully representative for either group as there exists some form for ties to the University. However, with careful consideration, it might seem that the case study findings contest the hypotheses H4-H5 linked to RQ2. In specific, the entrepreneurship does, strictly speaking, not have affiliation to an UEM yet still have high team maturity, innovation capability, and firm performance which refutes H4, H5 and H6, respectively.

In summary, the analysis of the case study supports hypotheses H1, H2, and H3 and thus RQ1 in full, yet it has not been found support for RQ2. Table 54 summarizes this below.

*Table 54 - Case Study Results*

		<b>Support</b>
<i>RQ1</i>	H1	Yes
	H2	Yes
	H3	Yes
<i>RQ2</i>	H4	NA
	H5	NA
	H6	NA

## 6. Conclusion

In this thesis, a study on team maturity, innovation capability, and firm performance in Norwegian entrepreneurship has been performed. The study has contributed with new insight in this area, as well as identifying several interesting elements for further research. Two research questions have guided the study: RQ 1: Is there an effect on firm performance from team maturity and innovation capability in entrepreneurship? And RQ 2: Is there an effect from University Master's programs in entrepreneurship on team maturity, innovation capability and/or firm performance in entrepreneurship? Six hypotheses were developed based on the theoretical foundation of the study, three for each of the research questions.

Through multiple-method data collection, both current and longitudinal data was obtained on the team maturity, innovation capability, and firm performance of each entrepreneurship. The sample population was comprised of three subgroups, two of which of entrepreneurship with an affiliation to a University Master's program for entrepreneurship, and one group without such an affiliation. A construct was developed for measuring innovation capability and firm performance, based on the literature review for the study. The results were analyzed according to the research questions and hypotheses, with multiple methods as results were somewhat unexpected and in some cases contradictory. Means analysis, correlation analysis and cluster analysis were the main methods that were applied. The following conclusions were reached through the discussion of the results:

The means analysis showed high levels of team maturity, innovation capability, and firm performance, thus supporting hypotheses H1, H2 and H3 of RQ1. However, there was not found higher team maturity, innovation capability or firm performance for the entrepreneurship that have an affiliation to a University Master's program for entrepreneurship, which refutes H4, H5, and H6 of RQ2. Moreover, two interesting findings on the use of teamwork for innovation was observed: First, that there is a positive relationship between the use of teamwork for innovation and innovation capability. Secondly, entrepreneurship with an affiliation to a University Master's program for entrepreneurship tends to use teamwork for innovation less than teams without such an affiliation.

The correlation analysis showed no significant correlation between team maturity, innovation capability, or firm performance. Meaning, no support for H1, H2, and H3 of RQ1 was identified from this method. Moreover, no correlation was found for group number, meaning that H4, H5, and H6 of RQ2 was also refuted by the correlation analysis. However, when performing a more detailed correlation analysis, there was found some support for H3, showing a positive correlation between team maturity and two elements of firm performance, namely solidity and sales growth. Moreover, there was found a positive relationship between actively using teamwork for innovation and two main elements of innovation capability; i.e. competence and strategy, and management and processes for innovation.

Furthermore, cluster analysis showed support for H1, that higher team maturity leads to higher innovation capability. No support was found for the other hypotheses.

Finally, a detailed case study found support for all hypotheses H1, H2, and H3 in RQ1, namely that high team maturity leads to high innovation capability, high innovation capability leads to high firm performance, and that high team maturity also leads to high firm performance moderated by innovation capability.

In sum, consistent support was found for H1 for all methods except the overall correlation analysis. This suggests that high team maturity in entrepreneurial teams leads to high innovation capability for the entrepreneurship. As for H2 and H3, more diverse results show some support for that high innovation capability leads to high firm performance in entrepreneurships (H2) and that high team maturity leads to high firm performance moderated by innovation capability in entrepreneurships (H3). However, as the results are somewhat varied, further investigation of these relationships in other studies is recommended before any absolute conclusions can be drawn.

As for RQ2, the results consistently did not support either H4, H5, or H6. This means that this study has not found any positive effect on team maturity, innovation capability, or firm performance from the affiliation to a University Master's program for entrepreneurship.

## 6.1 Limitations of the Study

First of all, there has been used self-reporting for the primary data in this study, which is widely regarded as a potential source to biased data in research (Deshpandé & Farley, 2004; Stone & Shiffman, 2002). This can have affected the results in some degree, however it is necessary for this type of study and has been found suitable for this type of research where comparisons across a sample of numerous objects is performed (Bhandari & Wagner, 2006; Deshpandé & Farley, 2004).

Another limitation of the study worth mentioning is that both innovation capability and firm performance lack a normative definition in research (Atalay et al., 2013; Iddris, 2016; Murphy et al., 1996; Samson & Gloet, 2013; Saunila, Pekkola, et al., 2014), which makes comparisons across studies challenging. Furthermore, measuring firm performance in entrepreneurships can be especially difficult, as many entrepreneurships have not produced income or profits (of significance) and may not have any debt. It is then very challenging to assess the firm performance using traditional methods such as financial ratios.

Finally, the data sample population includes only Norwegian entrepreneurships, thus the results may be restricted to a Nordic or Western business culture and other factors which may weigh in on the results. Moreover, the effect of a University Master's program for

entrepreneurship is measured by assessing only one such program, and the findings may vary for other such programs.

## 6.2 Implications and Further Research

The findings of this study have several implications for entrepreneurships, and in extent, innovative teams in general. A team maturity equal to production (as described by spin-theory) seems to offer adequate team dynamics that facilitate high innovation capability, which has been found to be a fundamental element of entrepreneurships (Brouwer, 1991; Galindo & Méndez, 2014). Thus, for entrepreneurship and other teams that strive to be innovative, it seems that training and consolidating a team maturity equal to production will lead the team dynamics of the team to facilitate for innovation.

Moreover, it has been found that using the team as an arena for innovation has a significant positive relationship with the innovation capability of the entrepreneurship. Thus, this finding implies that entrepreneurships should actively use the entrepreneurial team as an arena for innovation rather than that the leader or founder, or other individuals take on the task of product development, idea generation and other innovative work alone.

In accord with the findings of this study, there are especially two central areas which call for further research. First, it should be looked further into the firm performance for entrepreneurships, and how this can best be assessed with an accurate and comparable method. It is especially important to consider that traditional methods for assessing firm performance via financial ratios may not be as practical and accurate for entrepreneurships as for more mature firms. The effect of team maturity and innovation capability on firm performance can then be studied with larger probability for obtaining robust and unambiguous results.

Secondly, the method for assessing the effect of a University Master's program for entrepreneurship (and similar entrepreneurship courses and education) on team maturity, innovation capability, and firm performance should be studied in further detail. This is in line with other studies that arrive to the same conclusion (Duval-Couetil, 2013; Von Graevenitz et al., 2010), which indicate that there is a lack of understanding of the actual effect of these types of programs for entrepreneurship even though their popularity is growing increasingly (Duval-Couetil, 2013; Rideout & Gray, 2013).

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## Appendices

All appendices are enclosed in the original version (as instructed by IØT, NTNU). As Norwegian firms were the respondents of both the interviews and survey, Norwegian language was used in the data collection. Therefore, the interview guide is in Norwegian and the survey is partly in Norwegian.

### Appendix 1: Interview Guide, Case Study Entrepreneurship

The interview guide was used in semi-structured interviews.

#### **Intervjuguide: Åpent intervju om innovasjon**

1. (på hvilken måte) Er innovasjon viktig i deres bedrift?
2. Hvordan jobbes det med innovasjon i bedriften?
3. Hvordan samarbeides det i denne sammenheng?
4. Motivasjon – Hvordan skapes/opprettholdes motivasjon for/i arbeid med innovasjon?
5. Hvordan var arbeidet med innovasjon i bedriften ved oppstart/tidligere?
6. Beskriv utviklingen til bedriften, med hensyn til hvordan det arbeides med innovasjon?
7. Hva har endret seg (mtp. hvordan det arbeides med innovasjon)?
8. Hva er linken mellom arbeid med innovasjon og suksessen/lønnsomheten til bedriften?
9. Hva har vært de største utfordringene/hindringene for arbeidet deres med innovasjon?
10. Hva har fungert veldig bra/hjulpet arbeidet med innovasjon?
11. Hvorfor har det vært slik?
12. Annet som gjelder innovasjon?



## Appendix 2: Survey Questions: Team Maturity, Innovation Capability, and Firm Performance

The table below portrays the survey questions and the theoretical foundation of which, which was used to collect current data on team maturity, innovation capability and firm performance in the selected population of entrepreneurship.

The survey was developed through thoroughly assessing relevant literature in each of the fields of team dynamics, innovation capability and firm performance. Then, each question in the survey was consciously structured from a direct link to literature that was deemed fitting in the specific scope of this study. Furthermore, in order to develop exhaustive constructs, it is ensured that several perspectives are represented, as portrayed in the rightmost column.

The question formulations are in their original form, i.e. in Norwegian, as recipients of the survey were all Norwegian native speakers. As for the answer alternatives, a Likert scale 1-7 as defined by (Bryman, 2012) is applied for most questions for consistency in the dataset.

No.	Question	Reference	What reference says about something connected to this question (reason for including this question/topic)	Theoretical Perspective
<b>INNOVATION CAPABILITY</b>				
1	<b>Hva er selskapets hovedvirksomhet? (produkt, tjeneste, begge, annet med tekstboks)</b>	(Samson & Gloet, 2013)	«In manufacturing, innovation is often a structured, rigid and formalised process.» “In contrast, service sector organisations require less formalised approaches to innovation for successful outcomes.” “Moreover, it is likely that the ways in which intangible assets contribute to innovation differ across the two sectors.”	Ch. 2.2.3 Innovation Dimensions
		(Hogan et al., 2011)	Innovation capability dimension: Service/product	Produkt- eller serviceinnovasjon (Fagerberg, 2006a; Hogan et al., 2011)

2	<b>Hvordan vurderer du selskapets innovasjonsevne med hensyn til deres hovedvirksomhet? (skala 1-7)</b>	(Vicente et al., 2015)	“Innovation capability is a higher-order construct composed of innovativeness, technological capabilities, innovation strategy and new product development capability dimensions that should be assessed at the individual level.”	Ch. 2.2.3 Innovation Dimensions  Produkt- eller serviceinnovasjon versus prosess- eller organisasjonsinnovasjon (Brouwer, 1991; Castellacci et al., 2005; Fagerberg, 2006a; Hogan et al., 2011).
		(Guo & Zhou, 2016)	Innovation capability: product development	
3	<b>Hvordan vurderer du selskapets innovasjonsevne med hensyn til interne prosesser og organisasjonen? (skala 1-7)</b>	(Vicente et al., 2015)	“Innovation capability is a higher-order construct composed of innovativeness, technological capabilities, innovation strategy and new product development capability dimensions that should be assessed at the individual level.”	
		(Hogan et al., 2011)	Innovation capability dimension: Operational process	
4	<b>Hvordan vurderer du selskapets teknologiske kompetanse? (skala 1-7)</b>	(Vicente et al., 2015)	“Innovation capability is a higher-order construct composed of innovativeness, technological capabilities, innovation strategy and new product development capability dimensions that should be assessed at the individual level.”	Ch. 2.2.4 Strategic Resource Based View: Competence and Technology
		(Hogan et al., 2011)	Innovation capability dimension: Technology	
5	<b>Hvordan vurderer du den individuelle kunnskapen og kompetansen som finnes i bedriften? (skala 1-7)</b>	(Saunila & Ukko, 2014)	«Innovation capability is defined as the drivers of innovation; i.e., the aspects that influence a firm’s ability to manage innovation. According to the literature, these aspects include support culture, employees’ skills and innovativeness, employees’ welfare, leadership practices, processes and tools for managing ideas, development of individual knowledge, and links to strategic goals.”	Kompetanse og teknologi (Strategic resource-based view (Samson & Gloet, 2013))

	(Castellacci et al., 2005)	Knowledge-driven innovation is often linked to tacit knowledge in individuals.	
6	<b>Hvordan vurderer du selskapets innovasjonsstrategi? (skala 1-7, et alternativ må være finnes ikke el.)</b>	(Vicente et al., 2015)	“Innovation capability is a higher-order construct composed of innovativeness, technological capabilities, innovation strategy and new product development capability dimensions that should be assessed at the individual level.”
		(Saunila & Ukko, 2014)	«Innovation capability is defined as the drivers of innovation; i.e., the aspects that influence a firm’s ability to manage innovation. According to the literature, these aspects include support culture, employees’ skills and innovativeness, employees’ welfare, leadership practices, processes and tools for managing ideas, development of individual knowledge, and links to strategic goals.”
		(Samson & Gloet, 2013)	“(…) innovation drivers such as communication, learning and knowledge all flow more easily in goal-directed communities where managers develop strategic objectives and contexts.”
		(Iddris, 2016)	Dimensions of innovation capability: Innovation strategy
		(Hogan et al., 2011)	Innovation capability dimension: Strategy
7	<b>I hvilken grad er eksterne partnere, kunder osv. kilde til nyskapning og</b>	(Samson & Gloet, 2013)	«However, networks of partners, ‘imported’ knowledge, joint ventures in ideas and creativity together with almost every form of learning and ‘new-stream’ activity now crosscuts organizational boundaries. »

	<b>innovasjon for ditt selskap? (skala 1-7)</b>	(Iddris, 2016)	Dimensions of innovation capability: Organizational learning (from partners and customers)	
		(Hogan et al., 2011)	Innovation capability dimension: Client-solution	
		(Guo & Zhou, 2016)	Innovation capability: strategic alliances	
		(Castellacci et al., 2005)	Small firms benefit the most (with regards to innovation) from collaborating in interorganizational networks.	
		(Fagerberg, 2006a)	The user is the most important source of innovation for the firm.	
8	<b>I hvilken grad vurderer du arbeidsklimaet i selskapet til å være støttende? (skala 1-7)</b>	(Saunila & Ukko, 2014)	«Innovation capability is defined as the drivers of innovation; i.e., the aspects that influence a firm’s ability to manage innovation. According to the literature, these aspects include support culture, employees’ skills and innovativeness, employees’ welfare, leadership practices, processes and tools for managing ideas, development of individual knowledge, and links to strategic goals.”	Ch. 2.2.5 Strategic Resource Based View: Human Capital
		(Edmondson, 2013)	Innovation (and teaming) prerequisites psychological safety	HR/menneskelige faktorer og ledelse (Strategic resource-based view (Samson & Gloet, 2013))
9	<b>Hvordan vurderer du selskapets ansatte sin innovasjonsevne? (skala 1-7)</b>	(Saunila & Ukko, 2014)	«Innovation capability is defined as the drivers of innovation; i.e., the aspects that influence a firm’s ability to manage innovation. According to the literature, these aspects include support culture, employees’ skills and innovativeness, employees’ welfare, leadership practices, processes and tools for	

		managing ideas, development of individual knowledge, and links to strategic goals.”	
	(Hogan et al., 2011)	Innovation capability dimension: Behavioral	
10	<b>Hvordan vurderer du selskapets ansatte sin trivsel på jobb? (skala 1-7)</b>	(Saunila & Ukko, 2014) «Innovation capability is defined as the drivers of innovation; i.e., the aspects that influence a firm’s ability to manage innovation. According to the literature, these aspects include support culture, employees’ skills and innovativeness, employees’ welfare, leadership practices, processes and tools for managing ideas, development of individual knowledge, and links to strategic goals.”	
	(Samson & Gloet, 2013)	“Sustainable development factors, such as waste reduction, staff well-being and environmental output improvement go hand-in-hand with innovation.”	
	(Iddris, 2016)	Dimensions of innovation capability: Organization culture	

11	<b>Hvordan vurderer du lederskapet i selskapet med hensyn til innovasjon og klima for innovasjon? (skala 1-7)</b>	(Saunila & Ukko, 2014)	«Innovation capability is defined as the drivers of innovation; i.e., the aspects that influence a firm’s ability to manage innovation. According to the literature, these aspects include support culture, employees’ skills and innovativeness, employees’ welfare, leadership practices, processes and tools for managing ideas, development of individual knowledge, and links to strategic goals.”	
		(Samson & Gloet, 2013)	“Strong, determined, energetic, dynamic leadership is a prerequisite to sustained innovation capability.”	
		(Iddris, 2016)	Dimensions of innovation capability: leadership	
		(Crumpton, 2012)	Leadership is crucial for innovation.	
12	<b>Hvordan vurderer du selskapets prosesser og verktøy for å håndtere nye ideer? (skala 1-7)</b>	(Saunila & Ukko, 2014)	«Innovation capability is defined as the drivers of innovation; i.e., the aspects that influence a firm’s ability to manage innovation. According to the literature, these aspects include support culture, employees’ skills and innovativeness, employees’ welfare, leadership practices, processes and tools for managing ideas, development of individual knowledge, and links to strategic goals.”	
		(Iddris, 2016)	Dimensions of innovation capability: Idea Management	

13	<b>Hvordan vurderer du endringsvilligheten og risikovilligheten i selskapet? (skala 1-7)</b>	(Samson & Gloet, 2013)	“A willingness to embrace change supports sustained innovation capability. Innovation means taking risk, so managing risk prudently, along with costs and benefits, is a core capability. Innovation involves managing and implementing change.”	
		(Iddris, 2016)	Dimensions of innovation capability: creativity (allowing for mistakes)	
14	<b>I hvilken grad jobbes det målrettet med kreativitet i selskapet? (Skala 1-7)</b>	Robinson and Stubberud (2014)	Soft skills such as creativity, critical thinking, recognition of opportunities, and working efficiently in teams is imperatively important to master for entrepreneurs. Creativity is a prerequisite for innovation.	
		(Blanco-Mesa et al., 2016)	The importance of an environment that foster creativity and innovation for entrepreneurs is major.	
		(Castellacci et al., 2005)	Evolutionary innovation scholars have pointed out several characteristics of knowledge that is highly relevant for innovation: For example, knowledge is not static but evolves over time, driven by influences such as creativity and interactions with others.	
15	<b>Benyttes det målingssystemer for innovasjonsevne og/eller innovasjoner i selskapet? (Ja – is stor grad til ikke i det hele tatt)</b>	(Blanco-Mesa et al., 2016)	“Performance measurement can thus be used as a tool for improving SME performance through innovation capability.”	
		(Saunila, Pekkola, et al., 2014)	“Beyond providing empirical support for the innovation capability-firm performance relationship, this study confirms the role of performance measurement as an important moderating link.”	Ledelse og styringssystemer

			Management and Internal Processes (Atalay et al., 2013; Natarjan Venkatraman & Ramanujam, 1986)
<b>TEAM</b>			
16	<b>I hvilken grad arbeides det med innovasjon i team i selskapet? (Skala 1-7)</b>	Nijstad and De Dreu (2002)	Although individuals may be more creative, groups are typically more innovative than individuals.
		(Edmondson, 2012, 2013)	A team (or teaming) is the natural venue for innovation, as it allows for dynamic activity and learning.
		(West & Anderson, 1996)	Group processes and characteristic social processes in the team were found to be especially important to the overall level of group innovation.
17	<b>Legge SPGR-skjema inn i spørreundersøkelse</b>	(Sjøvold, 2002, 2006a, 2006b, 2014; Sjøvold and Park, 2007)	Management and Internal Processes (Atalay et al., 2013; Natarjan Venkatraman & Ramanujam, 1986)
<b>FIRM PERFORMANCE</b>			
18	<b>Hva er selskapets likviditetsgrad? Likviditetsgrad = sum omløpsmidler / sum kortsiktig gjeld (angi i tall med to desimaler)</b>	(Delen et al., 2013)	Liquidity ratio. "Ratio analysis can help stakeholders analyze the financial health of a company. Using these financial ratios, comparisons can be made across companies within an industry, between industries, or within a firm itself."
		Murphy et al., 1996	Liquidity is one of the most commonly used firm performance indicators.
			Performance indicators: financial data (Atalay et al., 2013; Natarjan Venkatraman & Ramanujam, 1986) from



19	<b>Hva er selskapets lønnsomhet? Lønnsomhet = (ordinært resultat før skatt + finanskostnader)*100 / ((sum egenkapital og gjeld i år x-1 + sum egenkapital og gjeld i år x)/2) (angi i %)</b>	(Delen et al., 2013)	Profitability ratio. "Ratio analysis can help stakeholders analyze the financial health of a company. Using these financial ratios, comparisons can be made across companies within an industry, between industries, or within a firm itself."	a first-hand data source (Murphy et al., 1996)
		(Murphy et al., 1996)	Profitability is one of the most commonly used firm performance indicators.	
20	<b>Hva er selskapets soliditet? Soliditet = sum egenkapital *100/sum egenkapital og gjeld (angi i %)</b>	(Delen et al., 2013)	Solvency ratio. "Ratio analysis can help stakeholders analyze the financial health of a company. Using these financial ratios, comparisons can be made across companies within an industry, between industries, or within a firm itself."	
		(Murphy et al., 1996)	Success/failure and leverage is one of the most commonly used firm performance indicators. (similar basic factors as solvency)	
21	<b>Hva er selskapets vekst i salg for forrige regnskapsår? (angi i %)</b>	(Delen et al., 2013)	Growth has been found to be the most important financial ratio.	
		(Murphy et al., 1996)	Growth, especially sales and profitability growth, is one of the most commonly used firm performance indicators.	

### Appendix 3: SPGR Data Table - Raw Data and Spin-Theory Vector Data

Below is inserted a table containing the SPGR raw data that was collected via the survey, and the processed team dynamics dimensions data. The processing method is according to SPGR-algorithm (Sjøvold, 2002, 2006a, 2014).

**Table of SPGR raw data (LHS of table) and processed data (12 vectors) (RHS of table)**

N = 61

L = Master's, longitudinal

M = Master's, non-longitudinal

Elemt.	1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	X	Y	Z	S	D	N	N	O	W	W	O	C	C	D	S	S	W	C	N	O	D	E							
										0	1	2	3	4	5	6	7	8	9	0	1	2	3	4			2	2	1	2	1	1	2	2	1	2	1	1															
58106	1	2	1	0	1	0	1	1	2	0	1	2	0	0	0	1	1	1	1	2	0	0	0	1	1	3	0	2	3	1	0	1	2	1	2	2	3	1	1	3	3	5	1	3	4	0							
58147	2	1	1	1	1	1	2	1	0	1	0	2	2	0	0	2	0	1	2	2	1	0	0	2	13	2	1	4	4	3	1	1	1	0	1	1	3	2	4	8	1	4	4	2	6	7							
L																																																					
58354	2	1	0	1	1	2	2	2	1	1	0	0	2	1	0	2	0	2	1	1	1	1	0	2	9	5	-	3	2	3	2	0	1	0	2	2	3	4	4	7	1	5	5	2	6	6							
L																											1																										
58416	1	1	2	0	1	1	1	2	0	1	0	1	2	2	1	1	0	1	2	2	1	0	0	1	4	5	6	3	2	1	1	3	1	0	1	3	4	2	3	6	1	7	2	4	4	5							
L																																																					
58091	1	2	0	0	0	1	1	1	2	0	0	2	2	1	0	1	1	2	2	2	1	0	0	1	5	9	2	3	3	1	0	0	1	0	3	3	3	3	3	6	1	6	1	3	6	5							
L																																																					
58092	2	2	0	1	0	2	1	2	1	0	0	2	2	0	0	2	0	2	2	2	1	0	0	2	12	10	0	3	4	3	0	0	0	0	2	2	4	4	4	7	0	6	3	2	8	7							
L																																																					
58099	1	1	2	2	0	2	1	2	1	0	0	2	2	1	0	2	0	1	2	1	2	2	1	2	9	2	3	3	4	4	2	2	0	1	3	2	3	3	3	6	1	5	6	5	7	5							
L																																																					

58113	1	2	0	1	1	2	1	2	2	0	0	2	1	1	0	1	0	0	2	2	1	1	1	1	2	6	2	3	3	2	1	0	1	1	3	3	4	2	2	5	2	7	3	3	5	3	
<i>L</i>																																															
58115	2	0	2	1	0	2	2	1	0	0	0	2	2	1	0	2	0	1	2	2	1	0	0	2	14	4	4	4	4	3	0	2	0	0	1	1	3	3	4	8	0	4	3	3	7	8	
<i>L</i>																																															
58116	2	1	1	1	1	2	1	1	0	0	0	2	1	0	0	1	0	1	2	2	0	0	0	2	11	5	0	3	4	2	0	1	1	0	0	1	3	3	3	6	1	4	2	1	7	5	
<i>L</i>																																															
58340	2	0	1	1	0	1	1	2	0	0	0	1	1	1	0	2	0	1	2	1	1	1	0	1	10	3	5	3	2	3	1	1	0	0	1	1	3	2	3	6	0	4	4	2	4	6	
<i>L</i>																																															
58414	2	1	1	2	1	1	2	2	1	0	0	2	2	1	0	2	0	1	2	2	0	0	0	2	13	4	3	4	4	4	0	1	1	0	1	2	4	2	4	8	1	6	4	2	6	7	
<i>L</i>																																															
58419	2	0	0	2	0	1	1	2	0	1	0	1	1	2	0	1	0	1	2	2	1	0	0	1	9	6	5	3	2	3	1	0	0	0	1	2	4	2	3	6	0	6	4	1	4	6	
<i>L</i>																																															
58527	2	1	0	2	0	1	1	1	2	0	0	2	2	0	2	2	0	2	1	2	0	0	0	2	11	4	0	2	4	4	0	2	0	0	2	1	3	3	4	6	0	4	4	4	7	6	
<i>L</i>																																															
58539	2	2	1	2	0	2	2	2	1	0	0	2	2	1	0	2	0	2	2	2	2	0	0	2	12	8	4	4	4	4	0	1	0	0	3	3	4	4	4	8	0	7	4	4	8	8	
<i>L</i>																																															
58842	2	0	2	2	0	2	2	2	1	0	0	2	2	0	0	2	0	2	2	2	0	0	0	2	17	4	2	4	4	4	0	2	0	0	1	0	4	4	4	8	0	4	4	3	8	8	
<i>L</i>																																															
58844	2	1	1	2	0	1	2	1	1	0	1	2	2	1	0	2	1	2	1	1	0	0	0	2	12	4	0	3	4	4	0	1	1	1	1	2	2	3	4	7	2	4	4	2	7	5	
<i>L</i>																																															
58848	2	0	1	2	0	2	2	0	0	0	0	2	2	0	0	2	0	1	2	1	0	2	0	2	17	-1	0	4	4	4	2	1	0	0	0	0	1	3	4	8	0	1	6	1	7	8	
<i>L</i>																																															
58588	2	1	1	1	0	1	1	2	0	0	0	1	2	2	0	2	0	2	2	2	2	0	0	1	9	9	6	3	2	3	0	1	0	0	2	3	4	3	4	7	0	7	3	3	5	7	
58595	2	1	0	2	0	1	2	2	0	0	0	2	2	0	0	2	0	2	2	2	0	0	0	2	17	6	1	4	4	4	0	0	0	0	0	1	4	3	4	8	0	5	4	0	7	8	
58599	2	0	1	1	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2	2	1	1	0	1	8	4	5	2	2	1	1	1	0	0	1	0	3	1	3	5	0	3	2	2	3	5	
58620	2	2	1	2	0	1	1	2	2	0	0	2	2	1	0	1	0	1	2	2	1	0	0	2	9	8	5	3	4	3	0	1	0	0	3	3	4	2	4	7	0	7	3	4	6	7	



58898	2	2	1	1	0	1	0	2	0	0	0	0	0	0	1	0	0	1	2	2	0	0	1	2	6	5	1	1	2	0	1	0	0	2	2	4	1	2	3	0	6	2	3	2	3		
58904	2	0	1	1	0	1	1	2	2	1	0	2	2	1	0	1	0	1	1	0	1	0	2	10	4	2	2	4	2	2	1	0	0	2	1	3	2	4	6	0	4	4	3	6	6		
58907	2	0	1	2	2	1	2	2	1	0	0	2	2	0	0	2	0	1	2	1	1	1	0	2	13	-1	2	4	4	4	1	1	2	0	2	0	3	2	4	8	2	3	5	3	6	6	
58912	1	2	1	1	1	1	0	2	2	2	1	1	0	1	1	1	1	1	1	1	1	1	1	1	-4	1	-	1	2	2	3	2	2	2	3	3	3	2	1	2	4	6	5	5	4	-	2
58913	2	2	2	2	0	1	2	2	0	1	0	2	2	0	0	2	0	2	2	1	1	0	0	2	15	3	3	4	4	4	1	2	0	0	1	2	3	3	4	8	0	5	5	3	7	8	
58914	1	1	1	1	0	1	1	1	1	0	0	1	1	0	0	1	0	0	2	1	0	0	0	1	7	2	3	3	2	2	0	1	0	0	1	1	2	1	2	5	0	3	2	2	3	5	
58915	2	0	1	2	0	0	2	2	0	0	0	2	2	1	0	1	0	1	2	1	1	1	1	1	12	2	7	4	3	3	1	1	0	1	1	1	3	1	4	8	1	4	4	2	4	7	
58926	2	1	1	1	0	2	2	2	1	0	0	1	1	1	0	2	0	1	1	1	2	0	0	2	8	5	4	3	3	3	0	1	0	0	3	2	3	3	3	6	0	5	3	4	6	6	
58931	1	0	1	1	0	1	1	1	0	0	0	2	2	0	0	1	0	0	1	2	1	1	0	2	10	2	2	2	4	2	1	1	0	0	1	0	3	1	3	5	0	3	3	2	5	5	
58933	1	1	2	1	0	1	2	1	1	1	1	1	1	1	1	0	2	1	1	2	1	0	1	4	1	4	3	2	2	2	3	0	1	3	2	2	3	2	5	1	4	4	6	5	4		
58934	1	2	1	1	0	1	1	1	1	1	2	1	1	0	1	1	2	1	2	1	2	1	1	1	-1	1	1	3	2	2	2	2	2	3	3	2	2	2	2	5	5	4	4	5	4	0	
58938	2	1	1	1	0	2	1	2	1	0	0	2	2	1	0	2	0	2	2	2	1	0	0	2	12	9	2	3	4	3	0	1	0	0	2	2	4	4	4	7	0	6	3	3	8	7	
58941	2	0	1	2	0	2	2	2	0	0	0	2	2	0	0	2	0	2	2	2	1	0	0	2	17	5	2	4	4	4	0	1	0	0	1	0	4	4	4	8	0	4	4	2	8	8	
58990	2	1	2	1	0	1	2	2	0	0	0	2	2	1	0	2	0	1	2	2	1	1	0	1	12	4	7	4	3	3	1	2	0	0	1	2	4	2	4	8	0	6	4	3	5	8	
59032	2	1	1	1	2	2	2	2	1	0	0	1	1	1	0	2	0	1	2	2	2	0	0	2	7	4	3	4	3	3	0	1	2	0	3	2	4	3	3	7	2	6	3	4	6	5	
59085	2	1	1	1	0	0	0	2	0	0	1	1	1	1	0	2	0	2	1	2	2	0	0	2	8	7	3	1	3	3	0	1	0	0	2	2	4	2	3	4	0	6	3	3	5	4	
59101	2	1	0	1	0	2	2	2	1	1	0	2	2	1	0	1	0	2	1	1	1	1	0	1	10	7	2	3	3	2	2	0	0	0	2	2	3	4	4	7	0	5	4	2	7	7	
59102	2	1	1	2	0	1	2	2	0	1	0	1	2	0	0	2	0	1	2	2	0	0	0	2	15	3	2	4	3	4	1	1	0	0	0	1	4	2	4	8	0	5	5	1	5	8	
59592	2	0	2	2	0	1	2	2	0	0	0	2	1	0	0	2	0	0	1	1	1	0	0	2	13	-1	5	3	4	4	0	2	0	0	1	0	3	1	3	6	0	3	4	3	5	6	

## Appendix 4: SPGR Data Table - Longitudinal and Current Processed Data 12 Vectors

The following tables portrays the processed data that have been analyzed into the 12 SPGR vectors for all entrepreneurial teams taking part in the sample population for this study.

The first tables portrays the longitudinal and current data for entrepreneurial teams of group 1, marked with L in appendix 3. Then, current data on group 2 and 3 is portrayed. Group 2 is marked with M after the 5 digit ID tag.

**SPGR data Entrepreneurship Master's longitudinal study**

Code	Typical behavior	58092		58844		58113		58527	
Year of measurement		2013	2017	2013	2017	2013	2017	2014	2017
<i>S1 Engagement</i>	Energetic, inviting others to contribute	3.69	4.00	3.78	4.00	3.75	2.00	3.33	4.00
<i>S2 Empathy</i>	Supportive, showing interest for others	3.31	3.00	3.56	3.00	3.44	3.00	2.83	2.00
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	2.5	4.00	3.33	3.00	3.56	2.00	3.17	3.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	3.44	4.00	3.89	4.00	3.75	3.00	3.33	4.00
<i>O1 Criticism</i>	Critical, opposing	1.19	0.00	1.00	1.00	1.31	0.00	0.50	2.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	1.19	2.00	1.44	1.00	1.75	3.00	0.83	2.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	0.38	0.00	0.11	1.00	0.75	1.00	0.67	0.00
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	0.50	0.00	0.11	1.00	0.56	1.00	0.67	0.00
<i>N1 Caring</i>	Taking care of others, attentive to relations	3.38	3.00	3.11	4.00	3.50	2.00	3.00	4.00
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	0.69	0.00	1.11	0.00	0.88	1.00	0.50	0.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	1.88	2.00	1.56	2.00	2.25	3.00	1.33	1.00
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	3.38	4.00	2.89	2.00	2.94	4.00	3.50	3.00

**SPGR data Entrepreneurship Master's longitudinal study**

Code	Typical behavior	58848		58354		58099		58842	
Year of measurement		2014	2017	2014	2017	2015	2017	2016	2017
<i>S1 Engagement</i>	Energetic, inviting others to contribute	3.50	4.00	3.25	4.00	3.44	3.00	3.56	4.00
<i>S2 Empathy</i>	Supportive, showing interest for others	3.56	4.00	2.54	3.00	2.67	3.00	3.16	4.00
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	3.39	3.00	3.54	4.00	2.72	3.00	2.92	4.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	3.44	4.00	3.29	2.00	3.22	4.00	3.20	4.00
<i>O1 Criticism</i>	Critical, opposing	0.61	1.00	0.42	0.00	1.06	2.00	0.92	2.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	0.39	0.00	1.04	2.00	1.83	3.00	1.28	1.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	0.44	0.00	0.46	1.00	0.89	0.00	0.64	0.00
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	0.39	0.00	0.25	0.00	0.50	1.00	0.36	0.00
<i>N1 Caring</i>	Taking care of others, attentive to relations	3.33	4.00	2.46	3.00	2.78	4.00	3.28	4.00
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	1.22	2.00	0.50	2.00	0.83	2.00	0.48	0.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	1.50	0.00	1.83	2.00	2.33	2.00	2.16	0.00
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	2.83	1.00	2.46	3.00	3.22	3.00	3.28	4.00



**SPGR data Entrepreneurship Master's longitudinal study**

<i>Code</i>	<b>Typical behavior</b>	58539		58091		58416		58147	
<i>Year of measurement</i>		2016	2017	2016	2017	2012	2017	2013	2017
<i>S1 Engagement</i>	Energetic, inviting others to contribute	2.92	4.00	3.04	3.00	3.41	3.00	3.25	4.00
<i>S2 Empathy</i>	Supportive, showing interest for others	3.08	4.00	2.91	3.00	3.25	2.00	3.28	4.00
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	2.44	4.00	2.61	3.00	3.22	2.00	3.22	2.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	3.00	4.00	3.04	3.00	3.09	2.00	3.41	4.00
<i>O1 Criticism</i>	Critical, opposing	1.36	1.00	1.09	0.00	1.28	3.00	0.81	1.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	1.52	3.00	1.96	3.00	1.66	1.00	0.94	1.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	0.80	0.00	1.70	1.00	0.53	1.00	0.69	1.00
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	0.72	0.00	1.13	0.00	0.63	0.00	0.38	0.00
<i>N1 Caring</i>	Taking care of others, attentive to relations	3.04	4.00	2.78	1.00	2.91	1.00	3.19	3.00
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	1.32	0.00	1.17	0.00	1.00	1.00	0.72	1.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	2.12	3.00	1.70	3.00	2.91	3.00	1.72	1.00
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	2.48	4.00	2.43	3.00	3.03	4.00	2.66	3.00

**SPGR data Entrepreneurship Master's longitudinal study**

<i>Code</i>	<b>Typical behavior</b>	58340		58419		58115		58414	
<i>Year of measurement</i>		2016	2017	2016	2017	2015	2017	2015	2017
<i>S1 Engagement</i>	Energetic, inviting others to contribute	3.63	3.00	2.75	3.00	3.53	4.00	3.75	4.00
<i>S2 Empathy</i>	Supportive, showing interest for others	3.63	3.00	2.75	3.00	3.38	4.00	3.63	4.00
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	2.88	2.00	3.00	2.00	3.12	3.00	3.13	2.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	3.75	2.00	3.50	2.00	3.59	4.00	3.56	4.00
<i>O1 Criticism</i>	Critical, opposing	0.88	1.00	1.25	0.00	1.29	2.00	1.06	1.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	1.00	1.00	1.25	1.00	1.50	1.00	1.88	1.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	0.56	0.00	1.00	0.00	0.56	0.00	0.38	1.00
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	0.31	0.00	0.75	0.00	0.59	0.00	0.13	0.00
<i>N1 Caring</i>	Taking care of others, attentive to relations	3.31	3.00	3.50	3.00	3.35	3.00	3.38	4.00
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	0.56	1.00	1.75	1.00	0.85	0.00	1.06	0.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	1.50	1.00	1.25	2.00	1.71	1.00	2.19	2.00
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	3.13	3.00	2.50	4.00	2.74	3.00	3.44	4.00

**SPGR data 2017 Other firms (M = Issued from entrepreneurial Master's)**

<i>Code</i>	<b>Typical behavior</b>	58106	58588	58595	58599	58620	58625
<i>S1 Engagement</i>	Energetic, inviting others to contribute	2.00	4.00	4.00	3.00	4.00	4.00
<i>S2 Empathy</i>	Supportive, showing interest for others	2.50	3.00	4.00	2.00	3.00	4.00
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	2.00	3.00	3.00	1.00	2.00	3.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	3.50	2.00	4.00	2.00	4.00	4.00
<i>O1 Criticism</i>	Critical, opposing	1.00	1.00	0.00	1.00	1.00	1.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	2.00	2.00	0.00	1.00	3.00	1.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	1.50	0.00	0.00	0.00	0.00	0.00
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	0.50	0.00	0.00	0.00	0.00	0.00
<i>N1 Caring</i>	Taking care of others, attentive to relations	1.50	3.00	4.00	1.00	3.00	4.00
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	0.00	0.00	0.00	1.00	0.00	0.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	1.50	3.00	1.00	0.00	3.00	1.00
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	3.00	4.00	4.00	3.00	4.00	4.00

**SPGR data 2017 Other firms (M = Issued from entrepreneurial Master's)**

<i>Code</i>	<b>Typical behavior</b>	58682	58694	58704M	58708M	58725	58732
<i>S1 Engagement</i>	Energetic, inviting others to contribute	4.00	3.00	4.00	1.00	4.00	0.00
<i>S2 Empathy</i>	Supportive, showing interest for others	4.00	1.00	4.00	3.00	3.00	0.00
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	4.00	1.00	4.00	3.00	3.00	0.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	3.00	2.00	4.00	3.00	4.00	0.00
<i>O1 Criticism</i>	Critical, opposing	1.00	1.00	0.00	0.00	2.00	2.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	2.00	1.00	0.00	1.00	2.00	2.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	0.00	0.00	0.00	1.00	0.00	2.00
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	0.00	0.00	0.00	1.00	0.00	0.00
<i>N1 Caring</i>	Taking care of others, attentive to relations	4.00	3.00	4.00	4.00	2.00	0.00
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	0.00	0.00	1.00	2.00	1.00	0.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	1.00	1.00	0.00	0.00	3.00	4.00
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	4.00	4.00	2.00	2.00	4.00	4.00

**SPGR data 2017 Other firms (M = Issued from entrepreneurial Master's)**

<i>Code</i>	<b>Typical behavior</b>	58738M	58762	58785	58811	58671M	58831M
<i>S1 Engagement</i>	Energetic, inviting others to contribute	4.00	4.00	4.00	4.00	4.00	4.00
<i>S2 Empathy</i>	Supportive, showing interest for others	4.00	4.00	4.00	4.00	4.00	3.00
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	2.00	2.00	2.00	2.00	2.00	2.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	4.00	4.00	4.00	3.00	4.00	4.00
<i>O1 Criticism</i>	Critical, opposing	0.00	3.00	1.00	1.00	2.00	3.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	0.00	2.00	1.00	2.00	0.00	1.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	0.00	0.00	0.00	0.00	0.00	0.00
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	0.00	0.00	0.00	0.00	0.00	0.00
<i>N1 Caring</i>	Taking care of others, attentive to relations	3.00	4.00	4.00	3.00	4.00	4.00
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	0.00	1.00	0.00	1.00	0.00	0.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	0.00	2.00	1.00	1.00	2.00	1.00
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	2.00	4.00	4.00	3.00	2.00	3.00

**SPGR data 2017 Other firms (M = Issued from entrepreneurial Master's)**

Code	Typical behavior	58833	58851	58856M	58895	58891	58898
<i>S1 Engagement</i>	Energetic, inviting others to contribute	4.00	4.00	3.00	3.00	3.00	2.00
<i>S2 Empathy</i>	Supportive, showing interest for others	3.00	3.00	3.00	4.00	3.00	1.00
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	3.00	0.00	4.00	3.00	2.00	1.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	3.00	3.00	2.00	2.00	2.00	1.00
<i>O1 Criticism</i>	Critical, opposing	1.00	1.00	2.00	1.00	2.00	1.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	2.00	1.00	1.00	2.00	2.00	2.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	0.00	0.00	1.00	0.00	0.00	0.00
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	1.00	0.00	1.00	0.00	1.00	0.00
<i>N1 Caring</i>	Taking care of others, attentive to relations	4.00	2.00	3.00	3.00	2.00	2.00
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	0.00	0.00	1.00	0.00	1.00	0.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	1.00	1.00	2.00	1.00	2.00	2.00
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	3.00	3.00	4.00	3.00	1.00	4.00

**SPGR data 2017 Other firms (M = Issued from entrepreneurial Master's)**

<i>Code</i>	<b>Typical behavior</b>	58904	58907	58912	58913	58914	58915
<i>S1 Engagement</i>	Energetic, inviting others to contribute	4.00	4.00	1.00	4.00	2.00	4.00
<i>S2 Empathy</i>	Supportive, showing interest for others	2.00	4.00	1.00	4.00	3.00	4.00
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	2.00	2.00	2.00	3.00	1.00	1.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	4.00	4.00	2.00	4.00	2.00	3.00
<i>O1 Criticism</i>	Critical, opposing	1.00	1.00	2.00	2.00	1.00	1.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	2.00	2.00	3.00	1.00	1.00	1.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	0.00	2.00	2.00	0.00	0.00	0.00
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	0.00	0.00	2.00	0.00	0.00	1.00
<i>N1 Caring</i>	Taking care of others, attentive to relations	2.00	4.00	2.00	4.00	2.00	3.00
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	2.00	1.00	3.00	1.00	0.00	1.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	1.00	0.00	3.00	2.00	1.00	1.00
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	3.00	3.00	3.00	3.00	2.00	3.00

**SPGR data 2017 Other firms (M = Issued from entrepreneurial Master's)**

<i>Code</i>	<b>Typical behavior</b>	58926	58931	58933	58934	59102	58938
<i>S1 Engagement</i>	Energetic, inviting others to contribute	3.00	3.00	2.00	2.00	4.00	4.00
<i>S2 Empathy</i>	Supportive, showing interest for others	3.00	2.00	3.00	3.00	4.00	3.00
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	3.00	1.00	3.00	2.00	2.00	4.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	3.00	4.00	2.00	2.00	3.00	4.00
<i>O1 Criticism</i>	Critical, opposing	1.00	1.00	3.00	2.00	1.00	1.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	3.00	1.00	3.00	3.00	0.00	2.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	0.00	0.00	0.00	2.00	0.00	0.00
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	0.00	0.00	1.00	3.00	0.00	0.00
<i>N1 Caring</i>	Taking care of others, attentive to relations	3.00	3.00	2.00	2.00	4.00	3.00
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	0.00	0.00	2.00	2.00	1.00	0.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	2.00	0.00	2.00	2.00	1.00	2.00
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	3.00	3.00	2.00	2.00	4.00	4.00



**SPGR data 2017 Other firms (M = Issued from entrepreneurial Master's)**

Code	Typical behavior	58941	59032	58990	59085	59101	59592
<i>S1 Engagement</i>	Energetic, inviting others to contribute	4.00	3.00	4.00	3.00	4.00	3.00
<i>S2 Empathy</i>	Supportive, showing interest for others	4.00	4.00	4.00	1.00	3.00	3.00
<i>D1 Loyalty</i>	Obedient, accept tasks, dutiful	4.00	3.00	2.00	2.00	4.00	1.00
<i>D2 Acceptance</i>	Cautious, show acceptance of the group	4.00	3.00	3.00	3.00	3.00	4.00
<i>O1 Criticism</i>	Critical, opposing	1.00	1.00	2.00	1.00	0.00	2.00
<i>O2 Assertiveness</i>	Assertive, self-promoting	1.00	3.00	1.00	2.00	2.00	1.00
<i>W1 Resignation</i>	Sad appearance, showing low self-confidence	0.00	2.00	0.00	0.00	0.00	0.00
<i>W2 Self-sacrifice</i>	Passive, reluctant to contribute	0.00	0.00	0.00	0.00	0.00	0.00
<i>N1 Caring</i>	Taking care of others, attentive to relations	4.00	3.00	3.00	3.00	2.00	4.00
<i>N2 Creativity</i>	Spontaneous, entertaining, derailing	0.00	0.00	1.00	0.00	2.00	0.00
<i>C1 Ruling</i>	Controlling, attentive to rules and procedures	0.00	2.00	2.00	2.00	2.00	0.00
<i>C2 Task-orientation</i>	Analytical, task-oriented, conforming	4.00	4.00	4.00	4.00	3.00	3.00

## Appendix 5: N-C, O-D and W-S Dimensions Team Maturity Analysis

The following table shows the team maturity analysis. Each dimension is evaluated to a team maturity level contribution  $m$ , and the average of the sum of  $m$  equals the overall team maturity of the entrepreneurial team.

<b>ID tag</b>	<b>N1-C1</b>	<b>m1</b>	<b>N2-C2</b>	<b>m2</b>	<b>O1-D1</b>	<b>m3</b>	<b>O2-D2</b>	<b>m4</b>	<b>W1</b>	<b>m5</b>	<b>W2</b>	<b>m6</b>	<b>S1</b>	<b>m7</b>	<b>S2</b>	<b>m8</b>	<b>M=<math>\sum m/7</math></b>	<b>M</b>	<b><math>\Delta M</math></b>
<i>L = old measurement (from Longitudinal study)</i>																			
58106	0	4	3	1	1	3	1,5	2	1,5	3	0,5	4	2	2	1	1	2,5	3	NA
58147	2	2	2	2	1	3	3	1	1	4	0	4	4	4	1	1	2,625	3	0,375
58147L	1,47	3	1,94	2	2,41	2	2,47	2	0,69	4	0,38	4	3,25	4	2,41	3	3	3	0
58354	1	3	1	3	4	1	0	4	1	4	0	4	4	4	4	4	3,375	3	-0,25
58354L	0,63	4	1,96	2	3,12	1	2,25	2	0,46	4	0,25	4	3,25	4	3,12	4	3,125	3	0
58416	2	3	3	1	1	3	1	3	1	4	0	4	3	3	1	1	2,75	3	0,375
58416L	0	4	2,03	2	1,94	2	1,43	3	0,53	4	0,63	4	3,41	4	1,94	2	3,125	3	0
58091	2	3	3	1	3	1	0	4	1	4	0	4	3	3	3	3	2,875	3	0
58091L	1,08	3	1,26	3	1,52	2	1,08	3	1,7	3	1,13	3	3,04	4	1,52	2	2,875	3	0
58092	1	3	4	1	4	1	2	2	0	4	0	4	4	4	4	4	2,875	3	0
58092L	1,5	2	2,69	2	1,31	3	2,25	2	0,38	4	0,5	4	3,69	4	1,31	2	2,875	3	0
58099	2	2	1	3	1	3	1	3	0	4	1	4	3	3	1	1	2,875	3	0,25

58115	2	2	3	1	1	3	3	1	0	4	0	4	4	4	1	1	2,5	3	0,25
<i>ID tag</i>	<b>N1-C1</b>	<b>m1</b>	<b>N2-C2</b>	<b>m2</b>	<b>O1-D1</b>	<b>m3</b>	<b>O2-D2</b>	<b>m4</b>	<b>W1</b>	<b>m5</b>	<b>W2</b>	<b>m6</b>	<b>S1</b>	<b>m7</b>	<b>S2</b>	<b>m8</b>	<b>M=Σm/7</b>	<b>M</b>	<b>ΔM</b>
58099L	0,45	4	2,39	2	1,66	2	1,39	3	0,89	4	0,5	4	3,44	4	1,66	2	3,125	3	0
<i>ID tag</i>	<b>N1-C1</b>	<b>m1</b>	<b>N2-C2</b>	<b>m2</b>	<b>O1-D1</b>	<b>m3</b>	<b>O2-D2</b>	<b>m4</b>	<b>W1</b>	<b>m5</b>	<b>W2</b>	<b>m6</b>	<b>S1</b>	<b>m7</b>	<b>S2</b>	<b>m8</b>	<b>M=Σm/7</b>	<b>M</b>	<b>ΔM</b>
58113	1	3	3	1	2	2	0	4	1	4	1	4	2	2	2	2	2,75	3	0,25
58113L	1,25	3	2,06	2	2,25	2	2	2	0,75	4	0,56	4	3,75	4	2,25	3	3	3	0
58115L	1,64	2	1,89	2	1,83	2	2,09	2	0,56	4	0,59	4	3,53	4	1,83	2	2,75	3	0
58116	1	3	3	1	2	2	4	1	1	4	0	4	3	3	2	2	2,5	3	NA
58340	2	2	2	2	1	3	1	3	0	4	0	4	3	3	1	1	2,75	3	0,125
58340L	1,81	2	2,57	2	2,87	2	2,75	2	0,56	4	0,31	4	3,63	4	2,87	3	2,875	3	0
58414	2	2	4	1	1	3	3	1	1	4	0	4	4	4	1	1	2,5	3	0,5
58414L	1,19	3	2,38	2	2,07	2	1,68	2	0,38	4	0,13	4	3,75	4	2,07	3	3	3	0
58419	1	3	3	1	2	2	1	3	0	4	0	4	3	3	2	2	2,75	3	0,125
58419L	2,25	2	0,75	4	1,75	2	2,25	2	1	4	0,75	4	2,75	3	1,75	2	2,875	3	0
58527	3	1	3	1	1	3	2	2	0	4	0	4	4	4	1	1	2,5	3	0,25
58527L	1,67	2	3	1	2,67	2	2,5	2	0,67	4	0,67	4	3,33	4	2,67	3	2,75	3	0
58539	1	3	4	1	3	1	1	3	0	4	0	4	4	4	3	3	2,875	3	0,375
58539L	0,92	4	1,16	3	1,08	3	1,48	3	0,8	4	0,72	4	2,92	3	1,08	2	3,25	3	0
58842	4	1	4	1	2	2	3	1	0	4	0	4	4	4	2	2	2,375	2	0,625

58842L	1,12	3	2,8	2	2	2	1,92	2	0,6 4	4	0,36	4	3,56	4	2		3	3	1
<b>ID tag</b>	<b>N1-C1</b>	<b>m1</b>	<b>N2-C2</b>	<b>m2</b>	<b>O1-D1</b>	<b>m3</b>	<b>O2-D2</b>	<b>m4</b>	<b>W1</b>	<b>m5</b>	<b>W2</b>	<b>m6</b>	<b>S1</b>	<b>m7</b>	<b>S2</b>	<b>m8</b>	<b>M=Σm/7</b>	<b>M</b>	<b>ΔM</b>
58844	2	2	2	2	2	2	3	1	1	4	1	4	4	4	2	2	2,625	3	0,25
58844L	1,55	2	1,78	2	2,33	2	2,45	2	0,1 1	4	0,11	4	3,78	4	2,33	3	2,875	3	0
58848	4	1	1	3	2	2	4	1	0	4	0	4	4	4	2	2	2,625	3	0,125
58848L	1,83	2	1,61	2	2,78	2	3,05	1	0,4 4	4	0,39	4	3,5	4	2,78	3	2,75	3	0
58588	0	4	4	1	2	2	0	4	0	4	0	4	4	4	2	2	3,125	3	NA
58595	3	1	4	1	3	1	4	1	0	4	0	4	4	4	3	3	2,375	2	NA
58599	1	3	2	2	0	4	1	3	0	4	0	4	3	3	0	1	3	3	NA
58620	0	4	4	1	1	3	1	3	0	4	0	4	4	4	1	1	3	3	NA
58625	3	1	4	1	2	2	3	1	0	4	0	4	4	4	2	2	2,375	2	NA
58682	3	1	4	1	3	1	1	3	0	4	0	4	4	4	3	3	2,625	3	NA
58694	2	2	4	1	0	4	1	3	0	4	0	4	3	3	0	1	2,75	3	NA
58704	4	1	1	3	4	1	4	1	0	4	0	4	4	4	4	4	2,75	3	NA
58708	4	1	0	4	3	1	2	2	1	4	1	4	1	1	3	3	2,5	3	NA
58725	1	3	3	1	1	3	2	2	0	4	0	4	4	4	1	1	2,75	3	NA
58732	4	1	4	1	2	2	2	2	2	3	0	4	0	1	2	2	2	2	NA
58738	3	1	2	2	2	2	4	1	0	4	0	4	4	4	2	2	2,5	3	NA
58762	2	2	3	1	1	3	2	2	0	4	0	4	4	4	1	1	2,625	3	NA
58785	3	1	4	1	1	3	3	1	0	4	0	4	4	4	1	1	2,375	2	NA
58811	2	2	2	2	1	3	1	3	0	4	0	4	4	4	1	1	2,875	3	NA
58816	2	2	2	2	0	4	4	1	0	4	0	4	4	4	0	1	2,75	3	NA

58831	2	2	0	4	1	3	3	1	0	4	0	4	4	4	1	1	2,875	3	NA
58833	3	1	3	1	2	2	1	3	0	4	1	4	4	4	2	2	2,625	3	NA
58851	1	3	3	1	1	3	2	2	0	4	0	4	4	4	1	1	2,75	3	NA
<b>ID tag</b>	<b>N1-C1</b>	<b>m1</b>	<b>N2-C2</b>	<b>m2</b>	<b>O1-D1</b>	<b>m3</b>	<b>O2-D2</b>	<b>m4</b>	<b>W1</b>	<b>m5</b>	<b>W2</b>	<b>m6</b>	<b>S1</b>	<b>m7</b>	<b>S2</b>	<b>m8</b>	<b>M=Σm/7</b>	<b>M</b>	<b>ΔM</b>
58856	1	3	3	1	2	2	1	3	1	4	1	4	3	3	2	2	2,75	3	NA
58885	2	2	3	1	2	2	0	4	0	4	0	4	3	3	2	2	2,75	3	NA
58891	1	3	3	1	0	4	0	4	0	4	1	4	3	3	0	1	3	3	NA
58895	0	4	4	1	1	3	2	2	1	4	0	4	4	4	1	1	2,875	3	NA
58898	0	4	4	1	0	4	1	3	0	4	0	4	2	2	0	1	2,875	3	NA
58904	1	3	1	3	1	3	2	2	0	4	0	4	4	4	1	1	3	3	NA
58907	4	1	2	2	1	3	2	2	2	3	0	4	4	4	1	1	2,5	3	NA
58912	1	3	0	4	0	4	1	3	2	4	2	3	1	1	0	1	2,875	3	NA
58913	2	2	2	2	1	3	3	1	0	4	0	4	4	4	1	1	2,625	3	NA
58914	1	3	2	2	0	4	1	3	0	4	0	4	2	2	0	1	2,875	3	NA
58915	2	2	2	2	0	4	2	2	0	4	1	4	4	4	0	1	2,875	3	NA
58926	1	3	3	1	2	2	0	4	0	4	0	4	3	3	2	2	2,875	3	NA
58931	2	2	2	2	0	4	3	1	0	4	0	4	3	3	0	1	2,625	3	NA
58933	0	4	0	4	0	4	1	3	0	4	1	4	2	2	0	1	3,25	3	NA
58934	0	4	0	4	0	4	1	3	2	3	3	1	2	2	0	1	2,75	3	NA
58938	1	3	4	1	3	1	2	2	0	4	0	4	4	4	3	3	2,75	3	NA
58941	4	1	4	1	3	1	3	1	0	4	0	4	4	4	3	3	2,375	2	NA
58990	1	3	3	1	0	4	2	2	0	4	0	4	4	4	0	1	2,875	3	NA
59032	1	3	4	1	2	2	0	4	2	3	0	4	3	3	2	2	2,75	3	NA
59085	1	3	4	1	1	3	1	3	0	4	0	4	3	3	1	1	2,75	3	NA
59101	0	4	1	3	4	1	1	3	0	4	0	4	4	4	4	4	3,375	3	NA

59102	3	1	3	1	1	3	3	1	0	4	0	4	4	4	1	1	2,375	2	NA
59592	4	1	3	1	0	4	3	1	0	4	0	4	3	3	0	1	2,375	2	NA

## Appendix 6: ICT Tools Applied in Study

The table below portrays the digital tools that were applied in the work on this Master's thesis.

<b>Digital tool</b>	<b>Purpose</b>
<i>Microsoft Word</i>	Text editing
<i>End Note</i>	Reference tool
<i>Oria</i>	Literature search
<i>Google Scholar</i>	Literature search
<i>Excel</i>	Data processing and analysis
<i>SPSS</i>	Data analysis
<i>Select Survey</i>	Data collection
<i>Gmail</i>	Distribution of survey

## Appendix 7: List of Interviews

<b>Name/ Title/Affiliation</b>	<b>Date</b>	<b>Type</b>	<b>Topic</b>
<i>Business employee, Case Study entrepreneurship</i>	9 <sup>th</sup> February 2017	Semi-structured Interview	Case study, Innovation in team in an entrepreneurship – management view
<i>Founder and professor at University Program for Entrepreneurship</i>	20 <sup>th</sup> February 2017	Unstructured Interview	University program for Entrepreneurship
<i>Technical employee, Case Study entrepreneurship</i>	21 <sup>st</sup> February 2017	Semi-structured Interview	Case study, Innovation in team in an entrepreneurship – technical view
<i>Joseph Samuel Schultz, Ph.D. Candidate Innovation Strategy and Innovation Management, NTNU</i>	17 <sup>th</sup> February 2017	Semi-structured Interview	Innovation research, development of methodology and approaches to data collection
<i>Employee, sample population entrepreneurship 1</i>	10 <sup>th</sup> March 2017	Unstructured Interview	Comments on the survey responses, additional information on the entrepreneurship
<i>Employee, sample population entrepreneurship 2</i>	13 <sup>th</sup> March 2017	Unstructured Interview	Comments on the survey responses, additional information on the entrepreneurship
<i>Employee, sample population entrepreneurship 3</i>	14 <sup>th</sup> March 2017	Unstructured Interview	Comments on the survey responses, additional information on the entrepreneurship



<i>Employee, sample population entrepreneurship 4</i>	15 <sup>th</sup> March 2017	Unstructured Interview	Comments on the survey responses, additional information on the entrepreneurship
<i>Employee, sample population entrepreneurship 5</i>	15 <sup>th</sup> March 2017	Unstructured Interview	Comments on the survey responses, additional information on the entrepreneurship
<i>Employee, non-sample population entrepreneurship 1</i>	23 <sup>rd</sup> March 2017	Unstructured interview	Measuring firm performance in entrepreneurships
<i>Employee, non-sample population entrepreneurship 2</i>	3 <sup>rd</sup> April 2017, 8 <sup>th</sup> May 2017	Unstructured interview	Measuring firm performance in entrepreneurships, measuring innovation capability
<i>Employee, sample population entrepreneurship 6</i>	4 <sup>th</sup> April 2017	Unstructured Interview	Comments on the survey responses, additional information on the entrepreneurship
<i>Employee, sample population entrepreneurship 7</i>	4 <sup>th</sup> April 2017	Unstructured Interview	Comments on the survey responses, additional information on the entrepreneurship

## Appendix 8: Firm Performance Raw Data

<i>ID tag</i>	<b>Liquidity. Primary data</b>	<b>Liquidity. Secondary data</b>	<b>Profitabilit y. Primary data</b>	<b>Profitabilit y. Secondary data</b>	<b>Solidity. Primary data</b>	<b>Solidity. Secondary data</b>	<b>Sales growth. primary data</b>	<b>Sales growth. secondary data</b>	<b>Pre launch Yes/No</b>
58106	1.00	1.88	10.00	12.30	10.00	51.60	10.00		N
58147	1000000.0 0	14.81	0.00	14.00	100.00	93.20	100.00		N
58354		1.48		0.00		38.30		0.00	Y
58416	6.00	5.70	44.00	-44.20	18.00		1000.00		N
58091	700000.00		0.00		0.00		0.00		Y
58092	28126.00	1.54	35.00	6.10	47.00	27.60	59.00		N
58099	0.00			0		1		0.00	Y
58113	1.00	1.63	10.00	30.60	10.00	14.60	10.00		N
58115	42795.00	1.03	0.00	-14.10	3.00	3.50	15.00		N
58340	1.00	0.92	0.00	-16.70	0.00	-8.50	0.00		N
58414	168.00		94.00		71.00		50.00		N
58419	150.00		0.00		0.00		0.00		Y

<i>ID tag</i>	<b>Liquidity. Primary data</b>	<b>Liquidity. Secondary data</b>	<b>Profitabilit y. Primary data</b>	<b>Profitabilit y. Secondary data</b>	<b>Solidity. Primary data</b>	<b>Solidity. Secondary data</b>	<b>Sales growth. primary data</b>	<b>Sales growth. secondary data</b>	<b>Pre launch Yes/No</b>
58527	1.10	-	0.00	-	10.00	-	0.00	-	Y
58539	0.00	-	0.00	-	0.00	-	0.00	-	Y
58842	20.00	-	100.0	-	90.0	-	0.00	-	N
58844	32509.00	-	38.0	-	49.0	-	100.00	-	N
58848	-	1	-	0	-	1	-	0.00	Y
58588	-	1	2.79	34.10	1.00	45.00	400.00	-	N
58595	27760.00	1.76	42841.00	16.40	51.7	51.70	0.50	-	N
58599	50.00	2.44	30.00	15.70	-	59.30	60.00	-	N
58620	-	1	-	0	1.00	-	-	0.00	Y
58625	-	1	-	-51.70	-	46.40	-	200.00	Y
58682	79	-	-12.35	-	0.00	-	109.46	-	N
58694	2.29	-	-0.13	-	-66.80	-	-	-1.00	N
58704	0.43	-	-4.83	-	-1.33	-	1.00	-	N
58708	0.07	-	-	0	3.30	-	420	-	N

<i>ID tag</i>	Liquidity. Primary data	Liquidity. Secondary data	Profitabilit y. Primary data	Profitabilit y. Secondary data	Solidity. Primary data	Solidity. Secondary data	Sales growth. primary data	Sales growth. secondary data	Pre launch Yes/No
58725	-	1	-	0	15	-	-	0.00	Y
58732	6.6	-	429.00	-	82.00	-	-	800.00	N
58738	2.38	-	61.80	-	57.90	-	-	58.00	N
58762	28185.00	-	-49.14	-	88.56	-	1.00	-	Y
58785	3.75	-	0.72	-	0.75	-	-	0.00	Y
58811	2.30	-	-	0	3	-	-	0.00	Y
58671	-	1	-	0	100.00	-	-	0.00	Y
58831	400000.00	1.25	0	3.10	400.00	20.50	-	200.00	Y
58833	-	1.00	-	-33.30	-	53.30	-	0.00	Y
58851	3.33	-	-	0	0.73	-	-	0.00	Y
58856	0.58	-	0.14	-	0.59	-	0.08	-	N
58885	-	1	-	0		1	-	0.00	Y
58891	-	1	75	-	95	-	-	20.00	N
58895	-	1	-	0	-	-	-	0.00	Y

<i>ID tag</i>	Liquidity. Primary data	Liquidity. Secondary data	Profitabilit y. Primary data	Profitabilit y. Secondary data	Solidity. Primary data	Solidity. Secondary data	Sales growth. primary data	Sales growth. secondary data	Pre launch Yes/No
58898	-	4.68	-	-128.30	-	79.00	-	-10.00	N
58904	-	19.47	-	-35.70	-	94.80	-	0.00	Y
58907	-	1	-	0	-	1	-	0.00	N
58912	-	1	-	0	100	-	-	0.00	Y
58913	-	1	66	-	-	1	-	0.00	Y
58914	-	1	-	0	-	1	-	0.00	Y
58915	-	1	-	0	-	1	-	0.00	Y
58926	-	1	-	0	-	1	-	0.00	N
58931	-	1.92	-	34.90	-	48.00	-	10.00	N
58933	0.25	-	-95.80	-	-250.70	1	0.19	-	N
58934	200000.00	1.78	0.00	47.90	-	43.90	-	10.00	Y
58938	-	0.48	-	78.60	-	35.20	400	-	Y
58990	-	0.0	-	0	90	1	-	0.00	Y
58993	-	1.41	-	73.40	-	41.00	-	100.00	N

<i>ID tag</i>	<b>Liquidity. Primary data</b>	<b>Liquidity. Secondary data</b>	<b>Profitabilit y. Primary data</b>	<b>Profitabilit y. Secondary data</b>	<b>Solidity. Primary data</b>	<b>Solidity. Secondary data</b>	<b>Sales growth. primary data</b>	<b>Sales growth. secondary data</b>	<b>Pre launch Yes/No</b>
59009	-	0	-	0	-	1	-	0.00	Y
59032	-	1.13	-	8.30	-	12.30	-	100.00	N
59085	3	0	-	0	62.00	1	-	300.00	Y
59101	34335.00	1.94	32.8	32.80	48.4	48.40	-	300.00	N
59102	44593.00	1.05	0.16	3.30	3.8	40.90	-	100.00	N
59592	-	1	-	0	1.00	-	-	1.00	Y

## Appendix 9: Innovation Capability Raw Data

The following data was collected via the survey and used as basis for the Innovation capability analysis.

<i>ID tag</i>	Survey Question													
	2	3	4	5	6	7	8	9	10	11	12	13	14	15
58106	6	6	5	6	4	5	5	6	6	6	2	7	2	3
58147	6	6	5	5	6	6	6	5	5	6	5	7	5	2
58354	7	4	6	6	7	3	6	6	6	7	7	6	5	2
58416	7	6	7	7	7	6	2	6	6	6	5	7	5	1
58091	5	4	7	7	4	3	4	5	5	4	5	5	4	1
58092	7	7	7	7	6	7	6	6	7	7	7	6	6	3
58099	6	6	5	7	5	7	5	7	5	6	5	7	5	3
58113	7	4	5	5	6	4	4	5	5	3	4	3	4	2
58115	7	6	6	5	7	7	6	6	7	6	6	7	7	1
58340	6	3	4	4	5	5	5	5	6	6	6	6	7	2
58414	7	6	6	6	7	5	6	6	7	6	4	5	6	4
58419	6	6	5	6	7	7	6	7	5	6	6	6	7	6
58527	6	6	7	6	5	5	6	6	7	6	6	7	6	1
58539	7	6	7	7	7	7	7	7	7	7	7	7	7	1
58842	6	4	6	6	7	2	6	6	7	6	7	7	5	1
58844	6	5	7	6	6	2	7	5	6	6	5	7	3	1
58848	7	6	6	6	7	3	7	6	7	7	6	7	7	1
58588	5	6	5	5	6	7	5	5	5	5	4	6	6	3

<i>ID tag</i>	Survey Question													
	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
58595	7	6	6	6	6	6	6	6	6	7	6	6	7	6
58599	7	5	7	7	7	6	7	5	6	6	6	7	7	1
58620	7	6	7	7	7	2	7	7	7	7	6	7	6	4
58625	4	4	4	4	0	4	4	4	5	4	4	4	4	1
58682	6	5	7	6	5	6	7	5	6	7	5	7	5	
58694	6	5	7	6	6	4	7	6	5	6	5	6	6	4
58704	6	5	6	6	7	7	7	7	7	7	5	6	6	1
58708	5	3	5	5	3	5	7	5	7	7	4	7	6	1
58725	6	6	6	6	6	4	5	6	7	5	4	7	5	1
58732	6	3	6	6	0	6	3	6	3	6	3	6	3	1
58738	6	6	6	6	6	3	7	6	7	7	5	5	7	4
58762	7	6	7	7	7	7	6	7	7	7	5	6	7	1
58785	6	4	6	6	6	5	2	5	6	6	4	5	4	1
58811	7	7	4	6	5	7	7	6	6	6	7	6	5	3
58671	5	5	4	4	0	1	7	5	6	6	5	6	7	1
58831	6	6	4	4	5	7	2	5	7	5	6	7	7	2
58833	6	6	7		5	6	7	5	4	5	5	7	6	2
58851	7	6	6	6	6	5	7	6	6	7	4	7	7	1
58856	6	5	6	7	5	7	7	6	6	5	6	6	7	4
58885	5	5	6	6	5	7	6	5	5	5	4	7	7	3
58891	4	5	4	6	5	5	6	5	6	5	5	6	5	2
58895	6	6	6	6	6	5	7	6	6		5	6	6	3
58898	7	6	7	7	6	6	6	6	7	5	4	6	6	1
58904	7	7	7	7	0	2	7	7	7	7	3	7	6	2



<i>ID tag</i>	Survey Question													
	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
58907	7	6	7	7	0	6	7	7	7	7	6	7	7	1
58912	6	6	4	5	6	5	3	4	2	4	5	5	7	1
58913	6	5	4	6	5	7	7	7	7	7	6	7	7	4
58914	5	4	7	3	4	5	1	3	5	4	3	3	2	2
58915	7	4	7	6	7	6	6	6	7	7	5	7	7	6
58926	6	5	5	5	6	3	5	5	6	6	5	5	5	7
58931	7	6	7	7	6	4	6	6	7	6	6	7	6	1
58933	4	4	3	4	0	4	4	3	7	5	5	7	5	5
58934	2	1	2	6	6	6	5	5	4	5	4	3	4	6
58938	7	5	7	7	7	6	6	7	7	6	7	6	6	5
58941	7	6	6	6	7	4	7	7	7	7	6	7	6	4
58990	6	7	7	6	5	7	6	6	7	6	6	7	6	1
58993	6	5	5	5	5	5	4	6	5	5	6	6	5	4
59032	7	6	6	7	6	6	6	6	7	6	7	7	7	7
59085	7	7	7	7	7	5	6	7	6	6	7	7	5	1
59101	6	6	4	6	6	2	7	6	6	6	5	7	6	1
59102	5	6	6	6	6	5	6	6	6	6	5	7	6	5
59592	4	6	7	7	5	6	7	7	7	7	7	7	4	1

Appendix 10: Detailed Correlation Table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<i>1 Innovation Capability (IC)</i>	1	0.052	-0.097	-0.291	0.303	.723*	0.195	-0.039	-0.095	-0.010	.773**	.887**	.803**	.786**
<i>2 Team Maturity (TM)</i>	0.052	1	-0.445	-0.516	-0.269	0.386	0.005	-0.372	-.609*	.692*	0.048	0.304	-0.274	0.067
<i>3 Firm Performance (FP)</i>	-0.097	-0.445	1	0.252	-0.160	-0.389	-0.239	.729*	.891**	-0.112	0.358	-0.092	-0.071	-0.415
<i>4 Group No.</i>	-0.291	-0.516	0.252	1	-0.263	-0.425	-0.110	0.046	0.276	-0.116	-0.045	-0.360	-0.067	-0.416
<i>5 Area of Operation</i>	0.303	-0.269	-0.160	-0.263	1	0.392	0.228	0.196	0.093	-0.260	-0.119	0.166	0.405	0.470
<i>6 Teamwork for Innovation</i>	.723*	0.386	-0.389	-0.425	0.392	1	0.326	-0.304	-0.241	0.312	0.421	.695*	0.440	.748**
<i>7 Liquidity</i>	0.195	0.005	-0.239	-0.110	0.228	0.326	1	-0.067	-0.150	-0.100	-0.040	0.142	0.044	0.430
<i>8 Profitability</i>	-0.039	-0.372	.729*	0.046	0.196	-0.304	-0.067	1	.681*	-0.457	0.114	-0.169	0.229	-0.243
<i>9 Solidity</i>	-0.095	-.609*	.891**	0.276	0.093	-0.241	-0.150	.681*	1	-0.298	0.165	-0.233	0.052	-0.231
<i>10 Growth Sales</i>	-0.010	.692*	-0.112	-0.116	-0.260	0.312	-0.100	-0.457	-0.298	1	0.241	0.360	-0.517	-0.105
<i>11 InnoProdProc</i>	.773**	0.048	0.358	-0.045	-0.119	0.421	-0.040	0.114	0.165	0.241	1	0.497*	0.497*	0.419*
<i>12 InnoCompStrat</i>	.887**	0.304	-0.092	-0.360	0.166	.695*	0.142	-0.169	-0.233	0.360	0.497*	1	0.390*	0.381*
<i>13 InnoHR</i>	.803**	-0.274	-0.071	-0.067	0.405	0.440	0.044	0.229	0.052	-0.517	0.497*	0.390*	1	0.657*
<i>14 InnoLeadProc</i>	.786**	0.067	-0.415	-0.416	0.470	.748**	0.430	-0.243	-0.231	-0.105	0.419*	0.381*	0.657*	1

\*Significance level 0.05 \*\*Significance level 0.01

