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Bisrat Agegnehu Misganaw

On entrepreneurial teams and their formation in science-based industries

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Why we know what we know about entrepreneurial teams? Unlocking implicit assumptions in entrepreneurial team research
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Article 2
How do entrepreneurial teams form? On mechanisms leading to entrepreneurial team formation
Bisrat Agegnehu Misganaw and Birgit Helene Jevnaker
Earlier version presented at the 2015 NORSI Conference, Trondheim

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On entrepreneurial teams and their formation in science-based industries

by
Bisrat Agegnehu Misganaw

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This thesis focuses on entrepreneurial teams and is positioned in the literature that conceptualize entrepreneurship as a collective action. Writing this PhD thesis could also be explained in the same way. Although it appeared to be the act of an individual, several people contributed throughout the process in one way or another, making it a collective action. I would like to take this opportunity to thank several individuals who were part of my "team" while writing this thesis.

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List of articles

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Abstract

The purpose of this thesis is to contribute to our understanding of entrepreneurial teams by investigating their formation in science-based industries. Prior research has consistently shown that a significant proportion of new ventures are founded by teams. Consequently, research on entrepreneurial teams (ETs) has been growing over the last couple of decades. However, the results have been inconclusive and sometimes contradictory. Furthermore, the formation aspect of ETs has largely been ignored. By using a mix of methods, including a systematic literature review and multiple case studies, this study attempts to address these gaps by answering three independent but interrelated research questions in three separate papers.

In the first paper I attempt to answer the research question 'why we know what we know about entrepreneurial teams?' Through a systematic literature review, I summarize the state of the art of Entrepreneurial team research and identify three implicit assumptions embedded in the prevailing research on ETs that may partly explain the inconsistent results in the literature and may have also partially hindered the development of a comprehensive theory of ETs. The second paper addresses one of the understudied topics in ET research – ET formation. The paper posed two explorative research questions: How do entrepreneurial teams form in science based industries? What are the mechanisms leading to their formation? Based on the findings from our multiple case study, we conceptualize ET formation as a process involving at least two periods where the mechanisms shaping the formation differ depending on which period of the formation process the ET is in.

In the third paper, we investigate whether and how ET formation in academic spinoffs is affected by institutional factors, specifically, changes in regulations governing the commercialization of research in public research institutes and the organization of technology transfer activities. Through a multiple case study of academic spinoffs in the life sciences sector in one region in Norway, we identify three groups of ETs that formed in different ways. Drawing on the theory of organizational imprinting, we found that the way ETs are formed and their composition in the three groups in part mirrors the social conditions at the time of forming, specifically the way technology transfer was organized and the regulations that governed the commercialization of academic research. The thesis further discusses the implication of the findings to the theory of organizational imprinting as well as the literature on academic spinoffs.

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1 Introduction

This thesis focuses on entrepreneurial teams in science-based industries. It particularly addresses the formation aspect of entrepreneurial teams (ETs) by exploring how they form, identifying some of the mechanisms leading to their formation, and demonstrating how the formation process is influenced by the way the support system to stimulate entrepreneurship is organized. This chapter presents the background of the study, the overarching and specific research questions guiding the study, as well as the positioning and contributions of the research.

1.1 Background

The 'romantic' conception of the entrepreneur as the all-powerful and all-knowing lone hero who fights against different challenges to realize his/her business ideas is one of the myths of entrepreneurship. This emphasis on the individual is observed even in some of the seminal works in the field (Harper, 2008). In fact, as argued by Foss and Lyngsie (2014), the focus of mainstream entrepreneurship literature is still the individual. Some scholars, however, have challenged the 'lone hero' assumption and call for the inclusion of 'non-individual' actors in entrepreneurship research. For instance, Gartner et al. (1994, p.6) stressed that "the entrepreneur in entrepreneurship is more likely to be plural", while Kamm et al. (1990) suggested that entrepreneurial teams should be the focus of entrepreneurship research as they occur more frequently in new venture creation. Indeed, research has consistently shown that a significant proportion of new ventures are founded by teams (Aldrich et al., 2002; European Startup Monitor, 2015; Francis & Sandberg, 2000). This proportion is even higher in science and technology-based industries, where ventures founded by teams may account for up to 85 per cent of the total new ventures (Honoré, 2015; Wasserman, 2012). Subsequently, research on entrepreneurial teams has been growing over the last couple of decades (Klotz et al., 2014; Schjoedt et al., 2013).

Probably due to the pervasive influence of the upper echelon perspective (Hambrick & Mason, 1984), however, research on ETs is dominated by studies focusing on the relationship between composition of teams (heterogeneity and homogeneity) and eventual performance of entrepreneurial ventures (Kirschenhofer & Lechner, 2012; Klotz et al., 2014; Zhou & Rosini, 2015). These studies have contributed immensely to our understanding about factors related to ETs and how they affect performance of the ventures created by the teams. Nevertheless, there are few studies that deal with the formation aspect of ETs and little is known about how ETs

form and emerge from the very beginning (Forbes et al., 2006; Hellerstedt, 2009; Schjoedt et al., 2013; Zhou et al., 2015). This is surprising, because without studying how ETs are formed, one may not have a complete picture of why and how the teams ended up with the composition they have. Rather, it seems that extant literature on ETs has taken the composition of the teams for granted and related study to outcome variables like venture performance. This study aims to contribute towards our understanding of ET formation by exploring how ETs form in science-based industries.

The rest of the chapter is structured as follows. I first motivate the research by discussing the research objectives and why the focus is on ET formation, offering general and specific research questions as well as the link between the three independent papers that constitute this thesis. Then, the research context is presented with the rationales (both theoretical and empirical) behind the choice, followed by the theoretical positioning of the research. Finally, I discuss the contributions of the study as well as the outline for the rest of the thesis.

1.2 Objective and research questions

The importance of the ET in the success or failure of new ventures has been recognized in both organizational sociology and entrepreneurship literature. For instance, in his influential essay on social conditions and organizations, Stinchcombe (1965, pp.148–149) coined the term "liability of newness" to explain the high rate of failure among new organizations. According to him, three of the four important factors causing the liability of newness for new ventures are related to the organizing team, where new working relationships have to be developed, roles need to be learned, and the financial rewards from the new venture have to be negotiated among the team members.

In line with this, team composition and its influence on venture performance is one of the topics that has received substantial attention in ET research, generating inconsistent and sometimes contradictory results (Jin et al., 2017; Klotz et al., 2014; Zhou & Rosini, 2015). For instance, team size and demographic diversity are found to relate positively to performance (Chandler & Lyon, 2001; Eisenhardt, 2013; Talaia & Mascherpa, 2011); however, Aspelund et al. (2005) found that larger team size is advantageous only if one does not control for heterogeneity. In another composition indicator, Leary and DeVaughn (2009) found that less industry experience in an ET positively influences new venture performance, which is in line with Shrader and Siegel (2007) but contrary to the findings of Colombo and Grilli (2005). Similarly, prior founding experience in the ET is found to relate positively to attracting

international funds to the team (Mäkelä & Maula, 2008) and venture performance (Leary & DeVaughn, 2009), which is opposite to the findings of Teal and Hofer (2003) and Aspelund et al. (2005).[1]

Over all, whether it is positive, negative or U-shaped, there is ample evidence suggesting that ET composition is an important factor in explaining new venture performance. In spite of this, there is little research addressing the question of how and why teams end up with the composition they have — in other words, how they form (Forbes et al., 2006; Harper, 2008; Steffens et al., 2012; Zhou et al., 2015). The extant literature rather seems to assume that the teams already exist, and directly proceeds to examining the effect of the team composition variables on performance (Jung et al., 2017). In fact, the topic of ET formation is one subject that has been rolling for years as an important research agenda in ET research but with limited response to the call (Cooney, 2005; Kamm et al., 1990; Schjoedt et al., 2013). The aim of this thesis, therefore, is to contribute to the literature on ETs by responding to this call and providing useful insights related to the formation of ETs. To this end, the study draws on multiple cases of ETs in life sciences academic spinoffs.

Research question(s) and overview of papers

The overarching research question guiding the research is: How do ETs form in science-based industries? This overarching research question is further divided into three sub-questions, each addressed in a separate paper. The following Table 1 summarizes the three papers constituting the thesis.

[1] Please see Paper I for detailed summary of previous research findings in this regard.

Table 1. Three papers constituting the thesis

Paper	Title	Theme	Respective literature
I	Why do we know what we know about entrepreneurial teams? Unlocking implicit assumptions in entrepreneurial team research.	Revisiting the existing literature	Literature on Entrepreneurial Teams and imprinting
II	How do entrepreneurial teams form? On mechanisms leading to ET formation.	ET formation and formation mechanisms	Literature on ET formation, and position imprinting
III	Entrepreneurial team formation practices in academic spinoffs — when the rules of the game are changing and players evolve.	Whether and how ET formation in academic spinoffs is affected by the way technology transfer is organized	Literature on academic entrepreneurship, ETs and organizational imprinting

In the first paper (Paper I), I carried out an extensive systematic literature review with the aim of identifying and challenging implicit assumptions embedded in ET research which may stimulate and direct future research. To this end, the research question posed in Paper I is:

RQ1: What do we know about entrepreneurial teams? Why do we know what we know?

The paper not only summarizes and pinpoints gaps in ET research, but also identifies three interrelated implicit assumptions embedded in current research on ETs, which, I argue, may partially hinder the development of a comprehensive theory in the field. Furthermore, the paper discusses how unlocking these implicit assumptions may contribute to theory development in the field by opening new research avenues (see Paper I for details).

From the findings of Paper I and other studies (Steffens et al., 2012; Zhou et al., 2015), it became clear that the process of ET formation is indeed one of the topics that remained underexplored in ET research. Studying how ETs form and the related mechanisms leading to their formation is interesting for several reasons. Firstly, organizational imprinting theory tells us that founders, along with other initial external conditions, are the most powerful sources of imprinting in new ventures (Ferriani et al., 2012; Kriauciunas & Shinkle, 2008; Marquis & Tilcsik, 2013). Thus, if founders are critical sources of imprinting and most ventures are founded by ETs, studying how the ETs themselves are formed from the beginning will be important in linking the organizational imprinting process to its roots. Secondly, unlike the somehow planned top management change in large firms (Kim et al., 2005), how the ET forms or changes over time may potentially have an appalling consequence in newly founded

ventures. The role of the ET could be reflected in terms of the initial strategy of the venture (Boeker, 1989: Burton et al., 2002), the positions created — i.e. position imprinting (Beckman & Burton, 2008; Burton & Beckman, 2007) — and the eventual turnover of the team (Chandler & Lyon, 2001). In order to understand this role of entrepreneurs and founders in shaping the course of the new venture, as argued by Kim et al. (2005), the pre-startup phase of ventures is an ideal context. As a precursor and vital activity in the pre-startup phase (Forster & Jansen, 2010; Hormiga et al., 2017) and beyond, studying the formation of ETs may help to understand organizational founding processes. Thirdly, from the policy perspective, knowing how ETs form, the related mechanisms, as well as who is doing what and why throughout the commercializing process may help to design policy instruments that will facilitate the formation of successful teams and support them throughout the entrepreneurial process.

Thus, Paper II attempts to address the largely ignored topic of ET formation by posing the following research question:

> RQ2: How do entrepreneurial teams form in science-based industries? What are some of the mechanisms[2] leading to their formation?

Given the limited research on the topic, we use a multiple case study approach (Eisenhardt, 1989; Yin, 2014) to develop new theoretical insights. Based on the empirical findings, the paper conceptualizes ET formation as a process and proposes at least two periods in the formation process with distinct mechanisms leading the formation process. We further argue that the prevailing perspectives on ET formation may not capture these mechanisms. Thus, this study offers alternative and/or complementary explanations for the prevailing views on ET formation.

By building on the findings of Paper II and challenging the existing perspectives on ET formation, in Paper III we (my supervisor and I) investigate how changes in the organization of technology transfer activities in universities and public research institutes affect the formation of ETs by studying multiple cases of ETs in academic spinoffs. The research question addressed in Paper III is thus:

[2] By mechanisms, we refer to "frequently occurring and easily recognizable causal patterns that are triggered under generally unknown conditions" (Elster, 1999, p.1). According to Elster (1999, p.5-6), "the antonym of a mechanism is a scientific law. A law asserts that given certain initial conditions, an event of a given type (the cause) will always produce an event of some other type (the effect) … [Thus], 'if A, then always B' … [but in mechanisms] it is 'if A, then sometimes B'. Thus mechanisms are good because they enable us to explain when generalizations break down."

RQ3: How do entrepreneurial teams in academic spinoffs form? How does a change in the organization of technology transfer activities[3] affect entrepreneurial team formation in academic spinoffs?

In the extant literature on ET formation, there are two dominant perspectives providing explanation about how ETs form — the rational model and the social-psychological model (Aldrich, 2009; Aldrich & Kim, 2007; Forbes et al., 2006). The rational model suggests that ETs form because of the desire of the lead entrepreneur(s) to fill a resource need that they cannot fulfil themselves, whereas the social-psychological model suggests teams are formed because of an interpersonal attraction and homophily (Ruef, 2010; Ruef et al., 2003). Although there is a third view, the institutional view, suggesting that ET formation is not always a strategic choice but is influenced by different institutional actors (Forbes et al., 2006), the view is not a central part of the ET formation literature. In Paper III, we argue that this view may need to be considered as an alternative explanation for ET formation by demonstrating that the change in the institutional set-up to support entrepreneurship may influence how ETs form in academic spinoffs.

To summarize, answering the three independent but related research questions has both theoretical and empirical implications. Theoretically, it will add to the extant literature on ET and ET formation by providing new insights into how ETs form and the related mechanisms leading the formation process. In addition, the findings will have implications for the literature on academic spinoffs and the theory of organizational imprinting. Practically, a better understanding of how ETs actually form and develop may help to design platforms that better facilitate team entrepreneurship and design policy instruments that may encourage ETs to form successfully (please see Chapter 7 for details on both the theoretical and practical implications).

All empirical cases considered in this study are from science-based industries, specifically from the life sciences sector in Norway. In the following section, I explain why the sector is chosen from both a theoretical and a practical point of view.

[3] By organization of technology transfer activities, we refer to both the regulatory framework governing the relationship between parent organizations and the entrepreneurial teams (and the spinoffs they create). In addition, we refer to the organization of the actors in the support system, including technology transfer offices as well as other government agencies installed to trigger academic entrepreneurship in the setting we studied.

1.3 Research context: why ETs in life sciences?

Although the life sciences sector was specified[4] when I started my PhD research at the Department of Innovation and Economic Organization, BI, it was chosen for both theoretical and empirical reasons.

Theoretical reasons. The life sciences sector has the potential to offer interesting cases for team entrepreneurship research in general, and formation and development of teams in particular, for several reasons. Firstly, because the skills and resources required to start a venture in life sciences are broadly distributed, and/or the technology changes quite rapidly (Whittington et al., 2009), entrepreneurial venture creation and development in the sector are characterized by the involvement of different stakeholders throughout the founding process (Owen-Smith & Powell, 2004; Powell et al., 2005). This makes entrepreneurship in the sector a collective or team effort, which provides fertile ground to study ETs.

Secondly, the sector is characterized by a very long R&D cycle and product lead time (Hine & Kapeleris, 2006). Because of this, the formation and development process of ETs in the sector will take a relatively long time, which will naturally require the involvement of several individuals and actors. This makes the sector suitable for a research on ETs following a processual approach. Thirdly, it offers an ideal setting to study teams engaged in novel and innovative entrepreneurial activities. As argued by Oliver (2004), the R&D process in the sector is mostly exploratory, without a priori understanding of the outcomes; hence it mostly involves teams. It is a knowledge-driven sector, accompanied by a constant flow of new and innovative ideas to develop new research tools, new processes for manufacturing and innovative business models (Majumdar & Kiran, 2012). Fourthly, the sector is a good representative of science-based sectors because "it exemplifies many of the general features of the sector" (Owen-Smith & Powell, 2004, p.8). Thus, these four features — novelty, involvement of different actors, extended time requirement and representativeness of the science-based sector — will be helpful to draw new theoretical insights to the existing literature. Because the life sciences industry is highly research-based, it is strongly linked with universities and research institutes (Pisano, 2006; Stuart et al., 2007). Consequently, our empirical cases are ETs trying to commercialize, or that have previously commercialized, an invention or idea generated from academic research in life sciences.

[4] The PhD position was specified as a project empirically positioned in the life sciences industry in Norway.

Empirical reasons. From a policymaking perspective, as noted by the European Commission (2007), the sector has received priority in innovation policies of the EU15+3 in recent years, where the annual expenditure on life sciences and specifically on biotechnology doubled between the periods 1994–1998 and 2002–2005. Since the early twenty-first century, the focus of policies towards the sector has been shifting from science-based to commercialization-based (European Commission, 2007). In spite of the policy in the EU, the implementation and development of the sector is quite diverse across states and even within states.

In Norway, the life sciences sector is one of the sectors that has received considerable attention from policymakers. For example, a single project programme in biotech and related sectors called the FUGE programme has provided NOK 1.6 billion in funding for research and development activities in the period from 2002 to 2012. In the national budget for 2012, the government proposed an annual allocation of NOK 89.5 million beginning in 2012 to continue the strategic activities in biotechnology through the Research Council of Norway. Furthermore, the government proposed a large budget increase in 2012 to give a major boost to the open competitive arena for excellence in research, and emphasized that this support must also be targeted towards further efforts in biotechnology. The government has also proposed an allocation of NOK 110 million for the period 2011–2016 to fund human bio banks and health registries (Norwegian Ministry of Education and Research, 2012).

In spite of all the attention and support it has recently received, Grønning (2009) argued that the sector is at a very early stage of development in Norway. However, it has seen many important events recently, specifically from the mid-1990s onwards (Grønning, 2009), evidenced by the growing number of entrepreneurial activities in the form of new firm establishments. For instance, of the 134 Norwegian biotech firms studied by Grønning (2009), 62 per cent were established between the period 1996 to 2007. This implies an increasing number of entrepreneurial activities in the biotech industry in Norway recently. However, there is a lack of research regarding why the entrepreneurial activities in the sector have been flourishing recently, how the ETs working in the sector are created, where they are now, and the institutional framework and support those ETs require to achieve their goals. Thus, research on entrepreneurial teams in this sector seems timely from both policy and practitioner perspectives.

1.4 Positioning of the study: a frame of reference

This thesis addresses a largely ignored theme in the ET literature — the formation of ETs (Ben-Hafaiedh, 2010; Forbes et al., 2006; Hellerstedt, 2009) — by studying selected cases from the life sciences sector. In doing so, the thesis is positioned within some theoretical and methodological perspectives. Accordingly, the thesis follows the behavioural approach to entrepreneurship (Gartner, 1989) and concurs with a line of literature that views entrepreneurship as a process of collective action (Ruef, 2010). Below, I briefly discuss what I intend with this line of reasoning and its relevance in answering the questions posed in this thesis.

In his seminal article "Who is an entrepreneur? is a wrong question", Gartner (1989) suggested that academic research on entrepreneurship should not worry about defining who the entrepreneur is. He criticized the traits approach in entrepreneurship research for removing the entrepreneur one step from the entrepreneurship phenomenon by focusing on the traits and characteristics that entrepreneurs possess. Portraying the entrepreneur in relation to certain types of personality with "a fixed state of existence" may imply that individuals will stay as entrepreneurs indefinitely once they become entrepreneurs (Gartner, 1989, p.48). However, as argued by Schumpeter (1939), "nobody ever is an entrepreneur all the time, and nobody can ever be only an entrepreneur" (Becker et al., 2011, p.301). Alternatively, Gartner (1989) suggested the behavioural approach, which focuses on activities involved in creating new organizations instead of traits of entrepreneurs as a focus.

Ruef (2010, pp.5–6) reinitiated this argument by asking what is considered entrepreneurship and an entrepreneurial activity in the prevailing entrepreneurship research. Consequently, he identified at least four different views about what is considered entrepreneurship and entrepreneurial activity. Firstly, there is a line of research that "ought to pay special attention to new combinations of existing methods and technologies", following the definition given by Schumpeter (1934). Here the entrepreneur is portrayed as an innovator responsible for creating new industries (Casson et al., 2008). Secondly, it is also possible to conceptualize entrepreneurship as "a successful act of organizational founding". The challenge here lies in defining when to claim that a successful act of organizational founding is completed. Thirdly, one can use the level of immunity from bureaucracy in distinguishing the entrepreneur from the manager by arguing, following Weber's (1968) argument, that the entrepreneur is relatively immune from control of rational bureaucratic knowledge. There is

another perspective that conceptualizes entrepreneurship as a sequence of activities resulting in the process of organizational creation (Gartner, 1989; Katz & Gartner, 1988). This perspective focuses on emerging organizations instead of those that have successfully materialized.

Although I agree with scholars suggesting that entrepreneurial process could be organized in different ways other than new firm creation (Shane, 2003), and team entrepreneurship could exist in different settings (Harper, 2008), in this thesis, I follow the streams of literature (Gartner, 1989; Ruef, 2010) that views entrepreneurship as a sequence of activities culminating in organizational creation. This organization creation process inherently requires a collective effort and may not be handled by a single entrepreneur. By building on this perspective of the emerging organization, Ruef (2010) suggested a perspective that stresses the need for collective action in founding new organizations. "This emphasis on entrepreneurial groups does not lead to an elision of the question as to 'who is the entrepreneur?' but re-conceptualizes it in a fundamental respect […] it considers entrepreneurship to range on a continuum that connects individuals to entrepreneurial groups based on their material and time investments, social networks, identities, and goals" (Ruef, 2010, p.7). Thus, the focus of this thesis is entrepreneurial teams working on new enterprise creation. The end of organizational creation may not necessarily be the legal foundation of a venture but the establishment of the main means-end framework within which the created organization operates.

Contrary to the mainstream view on entrepreneurship, I follow the literature that conceptualizes entrepreneurial process as a collective action. The dominant view in contemporary entrepreneurship research that mostly focuses on opportunity discovery (Shane, 2003; Shane & Venkataraman, 2000) is biased towards the individual (Foss & Lyngsie, 2014). In fact, the opportunity discovery perspective strongly claims that opportunity discovery "cannot be a collective act" (Shane, 2003, p.45) and unequivocally excludes all actors other than the individual. In this thesis, however, I follow the line of literature (Harper, 2008; Gartner et al., 1994; Kamm et al., 1990; Ruef, 2010) that puts teams at the centre of the entrepreneurship process. Conceptualizing the process in this manner (i.e. entrepreneurship as a collective effort towards the founding of a new organization) gives equal emphasis to both the discovery and the exploitation of entrepreneurial opportunities. As rightly argued by Foss and Lyngsie (2014), entrepreneurship involves the process of organizing and coordinating resources over time.

The focus on teams working towards creating new ventures is chosen for both theoretical and empirical reasons. Theoretically, what is largely ignored is the formation of teams in a new venture setting (Ben-Hafaiedh, 2010; Hellerstedt, 2009). For teams engaged in creating something new in already existing organizations, I would argue that the literature on work teams/groups could be applicable. The major difference between ETs and teams in established organizations is that the latter operate in a defined means-end framework, while the former create both the means and the end for themselves, as well as for the organizations they create in general. From a practical point of view, in the Norwegian context, there is an interest in building a strong biotech sector (Norwegian Ministry of Education and Research, 2012). One of the strategies to achieve this is to create more and stronger new ventures that may eventually lead to the development of a robust industry.

In order to capture this, the dissertation follows a process-based conception of entrepreneurship. Unlike the mainstream literature on ETs, which seems to focus on investigating the role of different factors on performance in a static manner, this study seeks to understand how ETs are formed and to conceptualize ET formation as a process, not a one-time event, where the team develops as it forms and eventually evolves. In addition, instead of identifying gaps, hypothesizing something from the theories and testing them, I chose to problematize (Alvesson & Sandberg, 2011) based on the findings of current literature on ETs (see Paper I). In addition, although the central focus is the entrepreneurial team, the thesis also seeks to incorporate and analyse the role of different actors in the entrepreneurial process through the formation of the entrepreneurial team.

The methodology followed in this research is thus tuned to attain this research objective. Since interviewing was used as the main data collection instrument, however, I acknowledge the constructionist view that, I, as a researcher, might have contributed to the meanings interpreted, although we have tried to stay close to what was formulated in the interviews. The interviews were conducted by two researchers, which also helped our critical inquiry in understanding what is actually going on there (see the methods chapter for detail). The following section discusses the contribution of the study.

1.5 Contribution

The findings of this study have theoretical as well as practical implications. Theoretically, the findings will contribute to three streams of literature. Firstly, the study contributes to the literature on ETs by challenging some of the implicit assumptions embedded in ET research

and deliberating how unlocking these assumptions may contribute to the effort of entrepreneurship research to develop a comprehensive theory of ETs. It also responds to the call for research on ET formation by providing new insights regarding how ETs form and identifying some of the mechanisms leading to their formation. In addition, as discussed in Chapter 2 and Paper I, prevailing research on ETs does not use the ET as a unit of analysis but the venture created by the ETs. Making the ventures created by ETs a unit of analysis rather than the ETs themselves is, in itself, neither wrong nor bad. However, a research that does not separately study ETs from the ventures they created ends up studying the evolution of the firms created by ETs rather than the ETs. Thus, by making the unit of analysis the ETs instead of the ventures they created, this study adds new insights to the literature on ETs.

Secondly, the findings will also have implications for the literature on academic spinoffs (Djokovic & Souitaris, 2008; O'Shea et al., 2014), where there is limited research at the team level (see Chapter 2 for details). The findings of this study show how ETs in academic spinoffs are formed and how a change in the organization of technology transfer activities to trigger academic entrepreneurship may affect the ET formation process by relating it to the existing theoretical perspective in mainstream ET research. Thirdly, the study will contribute to the organizational imprinting theory (see Chapters 2 and 7) by suggesting ET formation as an antecedent to the organizational founding process and arguing that the way ETs are formed may have implications for the imprinting process. Finally, the study contributes to practice by discussing implications of the findings for practitioners and policymakers (see Chapter 7 for details).

1.6 Outline of the study

The remainder of this dissertation is structured as follows. Chapter 2 reviews related literatures that inform and will be informed by the findings of this study. The selected literatures are the literature on academic spinoffs and the theory of organizational imprinting. The aim of the chapter is not to provide an exhaustive summary of the selected literatures. Rather, I limit the reviews to show and argue for the importance of studying ETs in the context in which I have studied them and to show how the findings will be linked with extant knowledge in the selected literatures. Chapter 3 then discusses the methodology chosen to conduct the research and the rationale behind the choice. The methodological discussion covers the methods deployed to conduct both the theoretical paper (Paper I) and the empirical studies (Papers II and III). The three papers that constitute the dissertation are then presented from Chapter 4 to 6. Finally,

after summarizing the findings of the studies, Chapter 7 discusses the implications of the findings in relation to the theoretical points discussed in Chapter 2 as well as implications for practitioners and policymakers. The chapter also presents limitations of the studies and concludes with suggestions for future research.

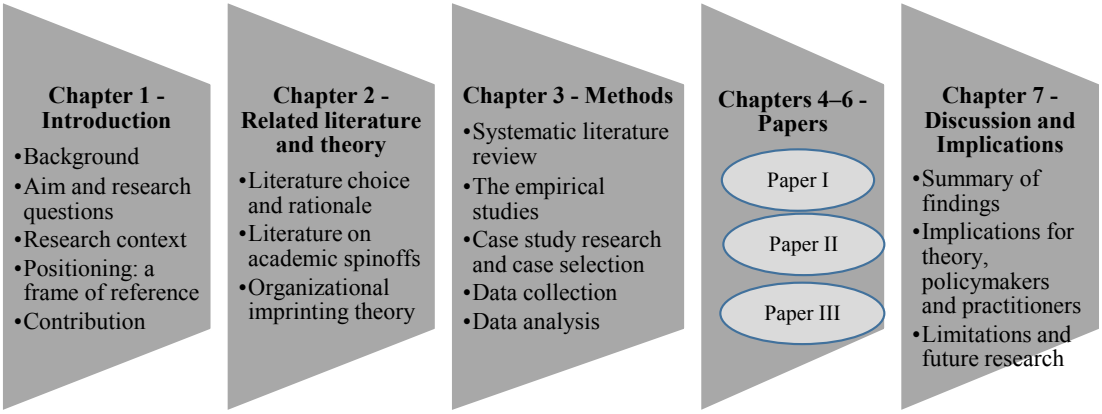

Figure 1. Outline and structure of the thesis

2 Situating the study theoretically

In this chapter, I review and discuss two literature strands that guide our inquiry into entrepreneurial teams (ETs) and their formation. The review provides a brief summary of each strand of literature, how it informs our inquiry into the phenomenon in which we are interested, and how the findings of this study could be linked with the literatures. The review also provides the basis for the discussion in Chapter 7 where the theoretical implications of the findings of the study are presented. Before proceeding to the review, I first discuss why the two streams of literature are chosen, how they are in line with our methodological choices and what role they play in the study.

2.1 Literature choice and rationales

A significant proportion of new ventures is founded by entrepreneurial teams (European Startup Monitor, 2015; Honoré, 2015; Wasserman, 2012), yet limited attention has been given to the formation aspect of ETs in entrepreneurship research (Schjoedt et al., 2013; Cooney, 2005; Zhou et al., 2015). With the aim of generating new insights and propositions related to ET formation, this study poses 'how' and 'why' questions to investigate the formation of ETs. Although we went to the field to investigate how ETs actually form, our inquiry is guided by three streams of literature: 1) literature on ETs; 2) literature on academic spinoffs; and 3) literature on imprinting theory. The literature on ETs is discussed separately in Paper I in detail with a systematic literature review. Thus, in this chapter, I only provide a brief account of the other two streams.

The intention of briefly summarizing and discussing the literature on academic spinoffs and the theory of organizational imprinting is not to conduct an exhaustive review and discuss the findings and results of previous research, nor to develop a hypothesis for empirical testing. The theories rather lead our inquiry into asserted relations and serve as sensitizing perspectives (Blumer, 1969). The role of sensitizing concepts, contrary to definitive concepts, is "to give the user a general sense of reference and guidance in approaching empirical instances. Whereas definitive concepts provide prescriptions of what to see, sensitizing concepts merely suggest directions along which to look" (Blumer, 1969, p.148). According to Blumer (1969, p.139), a research following this line of understanding of theories seeks to improve theoretical frameworks by "naturalistic research, that is by direct study of our natural social world wherein empirical instances are accepted in their concrete and distinctive form". Thus, guided by the sensitizing concepts, we investigate the formation of ETs "through the eyes of the people"

(Blumer, 1969, p.139) who are/were involved in the teams and the team formation process. Furthermore, we have questioned and problematized (Alvesson & Sandberg, 2013) some of the assumptions embedded in the three streams of literature. This exercise helped us to identify potentially new ways of looking at the phenomenon of interest, the formation of ETs, and use of the theories.

The three streams of literature were not selected a priori, but rather based on the initial findings from our field study and their relevance to the phenomenon of interest. In his article elaborating the link between theory and research phenomenon in entrepreneurship, Zahra (2007) identified four scenarios where theory could be utilized differently depending on whether the theory and research phenomenon are established or new. The phenomenon of interest in this thesis, which is related to entrepreneurial teams and their formation, is relatively new, while the streams of literature on organizational imprinting and academic spinoffs are relatively established. In this type of scenario, Zahra (2007, p.446) suggested three steps to contextualize theory in the research: 1) the relevance of the theories to the phenomenon needs to be discussed; 2) a fair test of basic arguments underlying theory needs to be provided; and 3) the results from the research should 'give back' to the theories. Following this approach, I discuss why the selected literatures are relevant for the phenomenon under investigation in the following paragraphs. I then provide the basic arguments in the selected literatures and further discuss their link with the research questions posed in this thesis. The implications of the research results for the theories are then discussed in Chapter 7.

Although they serve a similar role in guiding our inquiry, the two literature streams are relevant for different reasons. The literature on academic spinoffs is chosen because of the empirical context where the study was conducted. While studying team entrepreneurship in science-based industries, particularly in life sciences, we found that most of the ETs we studied were formed around a technology developed from a research undertaken at a university or a research institute. In fact, previous studies have also shown that the life sciences industry, particularly after the emergence of biotechnology, is heavily linked to university research and labs (Owen-Smith & Powell, 2003; Pisano, 2006; Powell et al., 2005; Shimasaki, 2009). Because of this, the literature on academic entrepreneurship and spinoffs becomes relevant and could not be overlooked. Thus, this study is sensitized by the accumulated research on academic entrepreneurship literature (see section 2.2), and the findings of this study will in turn contribute to the same literature (see Chapter 7).

The other stream of literature is the theory of organizational imprinting. This theory is relevant for our study because we follow the line of research that conceptualizes entrepreneurship as a set of activities culminating in venture founding (Gartner, 1989; Ruef, 2010). Organizational imprinting theory tells us that the social conditions at the time of the venture founding have implications for the future of new firms (Marquis & Tilcsik, 2013; Stinchcombe, 1965). This argument has been extended or adopted in different settings and with units of analysis, like individuals (Azoulay et al., 2017; Mathias et al., 2015), industry (Stinchcombe, 1965) or venture networks (Milanov & Fernhaber, 2009). Sensitized by the perspectives discussed in this line of research, we questioned if ET formation could also be shaped by the social conditions at the time of formation. Furthermore, we explore if (and how) the ET formation process could be linked with the organizational imprinting process. If this is the case, then it could be possible that organizational imprinting begins long before the formal founding of the new organization (see section 2.3 and Chapter 7 for further discussion on this). The following section summarizes and discusses the two selected literature streams.

2.2 Literature on academic entrepreneurship and spinoffs

The creation of new businesses and technology ventures from university and public research institutions has become an integral part of innovation policies in many countries (Rasmussen & Wright, 2015). In fact, though not a recent phenomenon, the commercialization of findings from academic research has substantially increased since the introduction of the Bayh-Dole Act in the USA (Siegel & Wright, 2015a) and similar legal acts elsewhere. This commercialization process has been further facilitated by the creation of Technology Transfer Offices since the 1980s (Lockett et al., 2015). At the beginning, technology transfer through patenting and licensing was the main strategy used to commercialize technology (Siegel & Wright, 2015b). Recently, however, policies in favour of creating more spinoffs than simply licensing out university inventions have been promoted (Shane et al., 2015).

An academic spinoff is understood in different ways in the literature. This difference in definition is mostly related to what kind of resources need to flow from the university or research institute, and to whom. According to one of the widely cited definitions in the literature (Nicolaou & Birley, 2003, p.340), an academic spinoff involves:

a) The transfer of a core technology from an academic institution into a new company.
b) The founding member(s) may include the inventor academic(s), who may or may not be currently affiliated with the academic institution.

In this sense, the core technology should be transferred to a new venture, but the inventors do not necessarily need to be either among the founders of the new venture or affiliated with the academic institution afterwards. Because most of the cases covered in this study are ETs that have commercialized or are trying to commercialize an invention developed from a university or research institute where at least some of inventors are/were involved in jointly transforming the ideas into enterprise conceptions, the findings of this study will have implications for the literature on academic spinoffs. Below, I discuss what has been studied in the literature on academic spinoffs and how studying ET formation in the setting is relevant.

2.2.1 What has been studied?

Different authors have synthesized prevailing research on academic spinoffs, categorizing it into different groups. For example, O'Shea et al. (2014) highlight six streams: four of them focus on determinants of spinoff activities (individual, organizational, institutional and external); the other two deal with consequences of spinoff activities (performance and development of spinoffs, and economic impact of spinoff activities). Djokovic and Souitaris (2008), on the other hand, divide the literature based on their level of analysis as macro-, meso- and micro-level studies. Mustar et al. (2006) took theoretical research tradition as a basis and categorized the literature into resource-based, business model and institutional. The following Table 2 summarizes the findings of the three literature review papers. Since the papers were published over an eight year span (the most recent in 2014, the oldest in 2006), it gives a good account of the focus of research in academic entrepreneurship so far.

Table 2. Summary of exemplary literature on academic entrepreneurship

O'Shea et al. (2014)			Djokovic and Souitaris (2008)			Mustar et al. (2006)		
Basis of classification: Research theme			Basis of classification: Unit (level) of analysis			Basis of classification: Theoretical perspectives used		
Stream of literature	**Focus**	**Examples**	**Stream of literature**	**Focus**	**Examples**	**Stream of literature**	**Focus**	**Examples**
Individual attributes and spinoff activity	The role of personality, ability and career choices as a determinant of spinoff activity	Audretsch (2000); Hoye & Pries (2009); Roberts (1991)	Micro-level studies	The role of founders in the spinoff formation process and its effect on performance; the effect of networks on spinoff performance and structure; performance of USOs	Clarysse & Moray (2004); Ensley & Hmieleski (2005); Nicolaou & Birley (2003); Shane & Stuart (2002)	Resource-based perspective	Predicting the competitive advantage of spinoffs based on the resources they have at their disposal	Shane & Stuart (2002); Vohora et al. (2004); Wright et al. (2004)
Organizational determinants	Nature of research funding, presence and configuration of support institutions such as TTOs on spinoff activities	Clarysse et al. (2005); Kenney & Patton (2009); Lenoir & Gianella (2006); Lockett & Wright (2005)						
Institutional behaviour as a determinant of spinoff activity	Culture and norms in the university like publish or perish policies, restrictive leave of absence policies, arrangement of royalty income distribution	Colyvas & Powell (2007); Kirby (2006); O'Shea et al. (2007)	Meso-level studies	The relationship between university spinoff mechanisms (incubators, TTOs and science parks) and university spinoff activities	Di Gregorio & Shane (2003); Lockett & Wright (2005); O'Shea et al. (2005)	Business model studies	Describing the activities of research-based spinoffs and what makes them different from other types of startup; how technology can be transformed into commercial value	Chiesa & Piccaluga (2000); Druilhe & Gamsey (2004); Heirman & Clarysse (2004)
External determinants of spinoff activity	Access to finance, legal assignment of inventions, the knowledge infrastructure in the region	Feldman & Francis (2003); Shane (2004b); Wright et al. (2006)						
Performance and development of university spinoffs	Stages or phases that university spinoffs pass through (dominated by linear models), factors determining performance of spinoffs like networks and social capital endowments	Ensley & Hmieleski (2005); Vanaelst et al. (2006); Vohora et al. (2004)	Macro-level studies	How government and the industry support and incentivize creation of spinoffs, technology and market factors beneficial for spinoff creation	Lockett et al. (2005); Shane (2001, 2004b)	Institutional perspective	The relationship between RBSOs and their parent organizations	Clarysse et al. (2005); Ferguson & Olofsson (2004); Phan et al. (2005)
Academic spinoffs and macro economy	Role of spinoffs in regional economic development	Shane (2004a)						

No matter how the literature on academic spinoffs is categorized, spinoffs have mainly been analysed from two angles, Mustar et al. (2006) proposes. Firstly, spinoff creation is analysed as part of the transfer process of technology generated in a research organization, where the process is addressed from the standpoint of the research organization (the parent organization). Secondly, studies following another rationale have examined spinoffs as organizations. Unlike studies in the first group, the focus in the second group of studies is the spinoff itself "with the parent being regarded as one source of resources among others and/or only indirectly influencing the initial conditions that shaped that company" (Mustar et al., 2006, p.301).

From the studies looking at spinoffs as organizations, those dealing with the formation and development of spinoffs and founding teams are more relevant for this research. The following sections briefly summarize studies dealing with spinoff development and discuss how the findings of this research relate to and complement the prevailing literature on academic spinoffs.

2.2.2 Spinoff development and founding teams

According to Ndonzuau et al. (2002), an academic spinoff process involves four stages: generation of business idea, finalization of new venture projects, spin-off firm launch and strengthening the creation of economic value. The process, however, is not straightforward and spontaneous, but passing through each stage requires overcoming different challenges. For instance, the main challenges during the first stage of the spinoff creation are related to the academic culture and internal identification of ideas worth commercializing (Ndonzuau et al., 2002), while challenges in the second phase are related to idea protection, idea development and financing (Ndonzuau et al., 2002). Yet, it seems that the process is portrayed as linear, where the opportunity is developed in the second stage and exploited while "managed by a professional team and supported by available resources" (Ndonzuau et al., 2002, p.286) in the third stage. In addition, the role of teams and how they are related to spinoffs is not discussed, although it is mentioned that the opportunity will be exploited and managed by a professional team. This could be because the unit of analysis in the study is the spinoff as an organization.

In a similar study, Vohora et al. (2004) investigated the development of university spinoffs and found a comparable result. Accordingly, they suggested five distinct phases (research, opportunity framing, pre-organization, re-orientation and sustainable returns) that academic spinoffs pass through. Passing through one phase is a requirement before moving to the next,

and the phases are connected by four critical junctures (opportunity recognition, entrepreneurial commitment, credibility and sustainability). The critical junctures are more or less congruent with the four phases identified by Ndonzuau et al. (2002). The difference is that the critical junctures in Vohora et al.'s (2004) model are not phases by themselves, but rather junctures connecting the five phases. In addition, Vohora et al.'s (2004) model portrays each stage of development as a dynamic process, and re-orientation of the business model or product is suggested as a stage by itself. Although ETs are discussed as critical resources performing different tasks in each phase of the spinoff development, the paper does not discuss the formation of the ETs behind the spinoffs and how they emerge or develop. In fact, this tendency seems to be true for the literature on academic spinoffs in general.

Despite the fact that composition and internal dynamics of ETs are identified among the most critical resources affecting the development and eventual performance of academic spinoffs (ASOs) (Diànez-Gonzàlez et al., 2016; Huynh et al., 2017; Wright et al., 2007), there are not many studies on team level in the ASO literature (Bjørnåli, 2009; Vanaelst et al., 2006). The formation and development of the ET behind ASOs seems even less studied. This is surprising, given that most ASOs are founded by ETs rather than single entrepreneurs (Visintin & Pittino, 2014). In fact, one of the emerging research agendas in academic entrepreneurship, suggested by Siegel and Wright (2015b), is related to the configuration of entrepreneurial teams for academic spinoffs, including the life of the team beyond the university phase. The studies by Clarysse and Moray (2004) and Vanaelst et al. (2006) are among the few exceptions in studying entrepreneurial team formation, while Bjørnåli (2009) studied board formation and evolution in academic spinoffs.

The main finding of Clarysse and Moray (2004, p.64) is that "shocks in the founding team and the position of its champion co-exist with shocks in the development of the business, along the life cycle of the new venture". They also identified four phases of development of both the venture and the entrepreneurial team: idea phase, pre start-up phase, start-up phase and post start-up phase. These phases are somehow similar to the steps identified by Ndonzuau et al. (2002) and Vohora et al. (2004), but the authors' main argument is that entrepreneurial teams' evolution interrelates with the lifecycle stage of the venture on which they are working. They showed that the roles of team members change depending on the lifecycle of the venture, and they explained who would assume what in terms of responsibility. However, they did not discuss the mechanism through which the team is formed and how additional team members are brought into the team.

Vanaelst et al. (2006), on the other hand, differentiated between teams of spinoffs that are not yet legally established, which they call pre-startup teams, and teams of spinoffs that are already legally established, which they refer to as post-startup teams, and studied the evolution of the team. Accordingly, they suggest that the pre-founding team, being the researchers taking the lead in the spinoff process, guided by the privileged witnesses (e.g. the technology transfer offices, peers and coaches), together identify the market opportunities. Afterwards, "surrogate entrepreneurs"[5] may be attracted and, together with the researchers, form the founding team and actively pursue the legal establishment of the firm. Once the firm is legally created, the boundaries of the founding team disappear and evolve into two other, maybe overlapping teams — the management team and the board (Vanaelst et al., 2006). Mostly, the researchers leading the spinoff trajectory have a position in the management team and a seat on the board of directors. Other members of the founding team, such as the privileged witness, usually become members of the board of directors.

A key issue related to team evolution, according to Vanaelst et al. (2006), is whether the people attracted into the new team bring to the startup a different experience and way of looking at doing business. Like Clarysse and Moray (2004), however, Vanaelst et al. (2006) do not discuss the mechanisms through which the team forms or the underlying mechanisms of how the team members are added in relation to the two alternative views in the mainstream literature of entrepreneurial teams (see Paper II for details). In addition, it seems that the studies assume that researchers (or inventors of the technologies behind the ASOS) make a rational decision about whether or not to create a spinoff and then build a team while the role of the privileged witness, which includes TTOs, is limited to helping the researchers in their entrepreneurial endeavour. We would argue that this might not always be the case and the ET formation process in ASOs might be contingent on other factors (see Paper III for details on this). In fact, Vanaelst et al. (2006) acknowledge that there is a need to study the formation of teams in ASOs in different institutional contexts, because different institutional environments in terms of the research institute context and the surrounding area may have an impact on the formation of teams.

This study will therefore respond to this by investigating the formation of ETs in ASOs in a Norwegian context. Furthermore, the present study focuses on spinoffs in one industry, the life sciences industry, which will respond to calls for sectoral contextualization of research on

[5] A surrogate entrepreneur is defined as "an outsider with commercial experience, who may be attracted to work together with the researchers to develop the venture" (Vanaelst et al., 2006, p.251).

ASOs (Gabrielsson et al., 2006). The ASO literature tends to assume that ASOs are the same regardless of the technology or the sector they commercialize. Finally, by studying ET formation in ASOs, the study will attempt to link the extant theoretical perspectives in ET formation with the literature on ASOs, which is said to be atheoretical in nature (O'Shea et al., 2005; Rasmussen et al., 2012). These theoretical contributions are further discussed in Chapter 7. In the following section, I will account for the literature on organizational imprinting and how it relates to the phenomenon we study, ET formation.

2.3 Organizational imprinting and founding of new ventures

2.3.1 Overview of imprinting theory

The concept of imprinting, originally developed in animal behaviour studies in the late nineteenth century (Marquis & Tilcsik, 2013), has been introduced into organizational studies following Stinchcombe's (1965) seminal essay on social structures and organizations. One of the propositions set by Stinchcombe (1965, p.153) was that "organizational forms and types have a history, and that this history determines some aspects of the present structure of organizations of that type. The organizational inventions that can be made at a particular time in history depend on the social technology available at the time." He further suggested that a theory intended to explain the relationship between the structure of organizations and their age needs to answer, among others, "why are organizational forms originated at different times different at the time of their foundation" (Stinchcombe, 1965, p.160). Although Stinchcombe (1965) did not use the term "imprinting" in his analysis, the concept is attributed to his paper (Marquis & Tilcsik, 2013). The literature on imprinting has been growing since then and the concept has been applied on different levels of analysis such as venture networks (Milanov & Fernhaber, 2009), organizations (Boeker, 1989; Han et al., 2014), entrepreneurial founding teams (Bryant, 2014) or even individuals (Azoulay et al., 2017; Mathias et al., 2015).

In a recent synthesis of the extant research on imprinting, Marquis and Tilcsik (2013) identified three different but equally important sources of imprints: institutional, economic and technological, and individual. The list of institutional imprinters includes "regulative, normative, and cultural-cognitive factors" (Marquis & Tilcsik, 2013, p.207), while the economic and technological factors include both macro-level economic conditions or economic conditions within organizations. The imprinting generated from these three sources could be manifested or imprinted on four entities: organizational collectives, single organizations, organizational building blocks and individuals (Marquis & Tilcsik, 2013, p.207).

In another review, Simsek et al. (2015, p.289) suggested that imprinting is not a "once-off episode whereby the environment is merely stamped upon an entity", but it "involves three processes in which an imprint is formed (genesis), evolves and morphs (metamorphosis), and eventually becomes manifest in outcomes (manifestation)". In the genesis phase, they argued, an imprint will be formed as a result of an interaction between the "imprinters (the sources of imprints) and the imprinted (the target entity that bears the imprint)" (p.290). The list of imprinters includes individual founders (for example, initial position holders), teams (their composition and diversity), and the environment (including regulatory conditions as well as institutional and cultural norms). However, we would argue that founders' composition and diversity of founders may not only be an imprinter but also something that is imprinted during the formation process of ETs. Consequently, we suggest that ET formation is an antecedent for ET composition and diversity. Although some aspects of teams are said to be imprinted in the literature, what is considered to be imprinted is, for example, the team process variables, such as transactive memory system and structure (Bryant, 2014; Zheng, 2012), not the team composition and diversity itself.

Overall, the 'imprinters' and 'imprinted entities' at the genesis stage identified by Simsek et al. (2015) are comparable with the classification by Marquis and Tilcsik (2013). The main difference between the two is that Simsek et al.'s imprinter, the environment, includes the economic and technological as well as the institutional imprinters in Marquis and Tilcsik's (2013) classification, and one additional imprinter, organization, is identified by Simsek et al. (2015). Furthermore, Simsek et al. (2015) suggested five entities bearing imprints, while Marquis and Tilcsik (2013) suggested four. The following table summarizes sources as well as bearers of imprints, as suggested by the two reviews and what has been studied regarding the relationship between the imprinters and the bearers.

Table 3. Summary of what has been studied in the imprinting literature (based on Marquis & Tilcsik, 2013; Simsek et al., 2015)

Marquis and Tilcsik (2013)					Simsek et al. (2015)			
		Sources of imprints				**Imprinters (Major types)**		
		Economic and technological	**Institutional (regulative, normative and cultural-cognitive factors)**	**Individual**		**The environment**	**Individuals/groups**	**Organizations**
Entities that bear imprints	***Organizational collectives***	How technological and economic conditions at the time of venture founding may shape industry structure (e.g. Stinchcombe,1965; Marquis, 2003).	How institutional factors influence variables related to industries and groups of firms, such as behaviour of MNCs (Kogut, 1993), emergence of new organizational forms (Schneiberg, 2002), etc.	The influence that leaders and entrepreneurs may have on industry structures (Raynard et al., 2013), business models (Hsu & Kenney, 2005), etc.	***Industries***	How environmental factors such as regulatory conditions, institutional and cultural norms, or population density imprint certain industry characteristics such as entry and rate of founding.	How individual and/or group factors such as founders' knowledge, experience, values and team composition and diversity imprint industry characteristics such as new entry and rate of founding.	How organizational factors such as size, strategy and history of success influence industrial factors such as new entry and rate of founding.
	Single organizations	How general economic and technological factors at the time of founding may imprint capabilities and routines in organizations (e.g. Shinkle & Kriauciunas, 2012), or how population density at the time of founding affects venture survival (Carroll & Hannan, 1989).	How institutional conditions influence firm strategy and capabilities: for instance, how firms' strategies are influenced by financing opportunities at the time of founding (Boeker, 1988) or existing organizational templates (Johnson, 2007).	How strategies of firms are influenced by variables related to individual founders, such as personality (Kimberly, 1979), founders' work experience (Burton et al., 2002), etc.	***Networks***	How environmental factors imprint certain features in a network such as size, structure and configuration.	How individual and/or group factors such as founders' knowledge, experience, values and team composition and diversity imprint certain features in a network such as size, structure and configuration.	How organizational factors such as size, strategy and success history imprint network variables such as size, structure and configuration.
	Organizational building blocks (e.g. units and departments, jobs,	How organizational building blocks are influenced by economic context (Miner, 1991) or the technological conditions available at the time when the blocks were formed (Perrow, 1999).	How jobs and occupations in organizations are imprinted by institutional factors such as selection and promotion criteria (Baron & Newman, 1990) or interaction between intra-organizational actors and the external environment (Cohen, 2012).	How positions in organizations are influenced by founders and initial occupants (Burton & Beckman, 2007).	***Organizations***	How environmental factors imprint organizational strategies, capabilities, routines, etc.	How individual and/or group factors imprint organizational strategies, capabilities, routines, etc.	How organizational factors imprint organizational strategies, capabilities, routines, etc.

	Individuals	How economic conditions (either at the macro level or within an organization) influence the behaviour of individuals in organizations. For instance, how economic conditions at the time of starting a career influence decision-making style (Schoar & Zuo, 2011), or existing financial risk in an organization in the early career of individuals affects their entrepreneurial career choices (Kacperczyk, 2009).	How institutional factors such as organizational culture influence the beliefs and values of early career managers (Higgins, 2005) and their career imprints (Dokko et al., 2009).	How role models and peers influence individuals' career choices and decision-making. For instance, how early career scientists' behaviour towards patenting is influenced by their mentors' commercial orientation (Azoulay et al., 2017), and how early co-worker characteristics shape entrepreneurial decisions (Kacperczyk, 2009).	***Teams***	How environmental factors such as regulatory conditions, institutional and cultural norms, or population density influence team level constructs such as transactive memory system, function experience and structure.	How individual and/or group factors such as founders' knowledge, experience, values and team composition and diversity influence team level constructs such as transactive memory system, function experience and structure.	How organizational factors such as size, strategy and history of success imprint team level constructs such as transactive memory system, function experience and structure.
					Individuals	How environmental factors such as regulatory conditions, institutional and cultural norms, or population density influence individual level characteristics such as knowledge and learning, or career roles.	How individual and/or group factors such as founders' knowledge, experience, values and team composition and diversity influence individual characteristics such as knowledge and learning, or career roles.	How organizational factors such as size, strategy and history of success imprint individual characteristics such as knowledge and learning, or career roles.

Although I concur with Marquis and Tilcsik (2013, p.235) that the extant literature on imprinting demonstrates that imprinting may "exist at multiple levels of analysis and at multiple sensitive periods", the segment that focuses on founders and the founding stage is more relevant for this study. This is because the focus of this research is the formation of ETs working towards founding a new venture.

2.3.2 Founders and imprinting theory: taking the founding of the founders for granted

Founders are said to have an imprinting effect on organizations in several ways — among others, by influencing the initial strategy of the organization (Boeker, 1989), positions created (Beckman & Burton, 2008; Burton & Beckman, 2007) or exit strategies (Albert & DeTienne, 2016). Indeed, Marquis and Tilcsik (2013) maintain that one of the areas where organizational imprinting research offers convincing evidence is related to the lasting effect of founders in organizations. Similarly, Kriauciunas and Shinkle (2008, p.7) emphasized that "powerful founders are the sources of imprint and they continue to exert influence on the firm that traditionalizes the imprint". Consequently, imprinting in newly created organizations could be explained as an agent-driven process where the decisions made by nascent entrepreneurs are the mechanisms through which new organizations obtain important features from their contexts (Johnson, 2007; Tornikoski & Renko, 2014).

In order to understand this process better, Johnson (2007) calls students of organizational imprinting theory to give more attention to the sequence of decisive activities in the venture founding process. In contrast to this, research in the field largely assumes that imprinting begins at venture inception (Mathias et al., 2015) and focuses on what happens after the founding of the venture (Aldrich & Yang, 2012). As stressed by Aldrich and Yang (2012), there are few empirical studies tracking startup activities and capturing how entrepreneurs negotiate and deal with challenges during the founding process.

By studying the ET formation process, this study will contribute to the organizational imprinting literature in several ways. Firstly, the composition of teams is taken for granted and considered as an imprinter in the imprinting literature. However, we would argue that the team composition could also be considered as becoming imprinted and this could be understood by studying how ETs themselves are formed. Secondly, the study responds to calls for empirical studies of imprinting on levels of analysis other than the organization. Simsek et al. (2015) stressed that much of the empirical research on imprinting focuses on the organizational level of analysis and organizational imprints such as culture, structure and cognition. One future

research area, they suggested, is related to the influence of founding environments on imprinting teams. Thirdly, there is a lack of insights related to how and why certain elements are imprinted, as research in the field so far has been mainly on what is imprinted (Simsek et al., 2015). In addition, "although imprinting is said to be a process, empirical investigations often are of variance, rather than process based, type, which has left the imprinting process black boxed" (Simsek et al., 2015, p.307). By following a processual approach to investigate the formation of ETs, this study may contribute by shedding some light on how ETs are formed and how the team composition is imprinted. The findings of this study will also have implications for the position imprinting literature. The following section briefly discusses how the position imprinting research sensitizes our inquiry on ET formation, and vice versa.

2.3.3 Position imprinting and ET formation

In the founding process of a new organization, one of the most important activities and decisions that co-founders have to undertake is related to the structure of the organization, where formalization of positions is an important element (Jung et al., 2017). This is because positions are one mechanism through which firm-level idiosyncrasies prevail over time through the process of position imprinting, which is defined as "legacies left by the first incumbents of particular functional positions" (Burton & Beckman, 2007, p.239). In spite of this, less is known about why and how positions are created from the beginning (Burton & Beckman, 2007). This is partly because so much of what is known about roles and positions is derived from studies of well-established bureaucracies (Burton & Beckman, 2007; Jung et al., 2017).

Position creation and allocation in a new venture context is, however, different from established firms and is challenging for co-founders for several reasons (Jung et al., 2017). For instance, new ventures mostly operate in a rather uncertain context and lack internal resources to develop. This may lead ventures to rely on external resource holders whose support and approval are vital for their success (Jung et al., 2017). In addition, co-founders tend to have similar backgrounds and skills sets, which makes the process of assigning positions problematic, Jung et al. (2017) contend. This implies that the way founders came together may have an implication on how positions are assigned. For instance, the argument that assignment of positions could be problematic if co-founders have similar backgrounds and skills sets (Jung et al., 2017) may imply that ETs formed through homophilous affiliation (Aldrich & Kim, 2007; Ruef et al., 2003) could have problems in creating and assigning positions because of the similar backgrounds they have (please see Chapter 7 for further discussion on this). Thus,

studying how ETs form may help to generate new insights into how positions are created and allocated in new ventures.

According to Jung et al. (2017), there are two contending views regarding how positions are created in new ventures. In the first view, the external institutional view, positions are created to satisfy some expectations set by the external environment to gain legitimacy (Burton & Beckman, 2007; Jung et al., 2017). In the second view, the internal idiosyncratic jobs view (Jung et al., 2017) or the constructionist view (Burton & Beckman, 2007), positions are created through negotiation within the organization. The negotiation depends on the local context of the organization as well as the idiosyncratic characteristics of individual incumbents constituting the founding team. This implies that the composition of the founding team — or, in other words, the individuals involved in creating the new venture — is a crucial factor in determining what kinds of position will be created at the beginning. Thus, we would argue that studying how ETs are formed may add to our understanding of position creation in new ventures, because the eventual composition of the team could be determined based on how the team is formed.

To sum up, we argue that studying the formation of ETs may contribute to both the organizational and the position imprinting literatures by moving the point where the imprinting process is assumed to have begun to an earlier period — i.e. before the time of the founding of the venture. We concur with Beckman and Burton (2008, p.19) that venture founding is not truly the beginning and "future teams may be best understood by a detailed examination of the teams that have come before". Therefore, studying ETs and their formation may help to understand how future teams in an organization might be shaped, as well as what kinds of position will be created. This is because the first positions in an organization may be created through negotiation among the founding members and the first occupant of the position is the one who will most likely instantiate the newly created position (Burton & Beckman, 2007). By definition, citrus paribus, the latter occupants of a given position will take over a more established position than their predecessors. Thus, answering the 'how' question of the formation process may help to answer the question of how positions are started by telling us what the team members bring on board and the power they may have to negotiate their positions in the new venture (Burton & Beckman, 2007). In order to understand this, we argue, we need to know not only what each team member brings to the negotiation table but also how the members themselves are brought on board, which in turn may influence their negotiating

power. The findings of this study, which deals with how ETs form, thus may have implications for this literature by providing empirical evidence on the ET founding process.

2.4 Summary and concluding remarks

The focus of this study, as discussed throughout this section and in Chapter 1, is on ETs and their formation. Thus, it is centrally positioned in the entrepreneurial team/team entrepreneurship and academic entrepreneurship literature. The analysis and theorization are also sensitized by the literature on organizational imprinting. Consequently, the findings of this study inform and contribute to these three literature streams. Although we utilized the three streams of literature in the three papers constituting the study, the magnitude differs across the three papers. The following Table 4 summarizes how the research questions posed in each paper are drawn from and linked to each stream of literature.

Table 4. How the three papers constituting the study are linked with the three streams of literature

Paper	Research question	Problematizing from the extant literature	Literature base
I	What do we know about ETs? Why do we know what we know?	Growing literature on ETs but there is a lack of comprehensive theory to explain ETs.	Literature on ETs
		Imprinting begins at venture inception, and the focus has been on what happens after the founding of the venture (Aldrich & Yang, 2012; Mathias et al., 2015).	Literature on imprinting
II	How do ETs form in science-based industries? What are some of the mechanisms leading to their formation?	There are two perspectives in ET formation, but they do not necessarily explain ET formation in all settings and contexts, and other perspectives are needed.	Literature on ETs
		Imprinting begins at venture inception, and the focus has been on what happens after the founding of the venture (Aldrich & Yang, 2012; Mathias et al., 2015).	Literature on imprinting
III	How do entrepreneurial teams in academic spinoffs form? How does a change in the organization of technology transfer activities affect entrepreneurial team formation in academic spinoffs?	Institutional factors have been mentioned as alternative explanations for ET formation, but this is not a central part of the ET literature (Forbes et al., 2006).	Literature on ETs
		Most ASOs are founded by ETs rather than single entrepreneurs (Visintin & Pittino, 2014), but there are few studies on team level in the ASO literature (Bjørnåli, 2009; Vanaelst et al., 2006) and even fewer about ET formation in ASOs. Institutional factors have been identified as important factors — for instance, in determining the number and type of spinoffs (Mustar et al., 2006), or resource endowment of spinoffs (Moray & Clarysse, 2005); but how changes in the institutional setup may affect the way ETs in ASOs form has not been studied.	Literature on ASOs
		Founding conditions (the social structure at the time of founding) defines the initial characteristics of organizations (Stinchcombe, 1965). Imprinting could take place on different levels of analysis (Marquis & Tilcsik, 2013), and more empirical research is needed on how the social structure is imprinted on other levels of analysis such as the team level (Simsek et al., 2015).	Literature on imprinting

To summarize this study is mainly positioned in the literature on ETs but is sensitized by the literature on organizational imprinting and ASOs. A discussion of the implications of our findings for the three literatures is provided in Chapter 7. Before proceeding to each specific study in Chapters 4, 5 and 6, the following chapter discusses in detail the methodological framework used in conducting the research.

3 The study's method and material[6]

In this chapter, I explain the method I chose and utilized to conduct this thesis project. The chapter begins with an overview of the methodology and then provides a detailed account of the steps followed throughout the research process. The limitations and trade-offs attached to the chosen method are also discussed.

3.1 Overview

The purpose of this thesis is to contribute to the understanding of entrepreneurial teams and their formation in science-based industries. The overarching research question that guides the research is how entrepreneurial teams form in science-based industries. To this end, I addressed three independent but interrelated research questions by using a mix of methods, specifically an abductive qualitative multiple-case study approach (in Papers II and III), and a systematic literature review (in Paper I).

The way the research for this thesis progressed could best be described as an abductive research process. Abductive research, similar to inductive research, starts from an empirical basis, but "does not reject theoretical preconceptions" (Alvesson & Sköldberg, 2009, p.4). It rather analyses empirical facts in relation to theories in the extant literature. Yet, abductive research uses theory as a source of inspiration to find out patterns that may bring understanding of the phenomenon under investigation, not as a mechanical application to single cases (Alvesson & Sköldberg, 2009). This use of theory is similar to what Blumer (1969) would call theory as a sensitizing perspective. Therefore, my research process "alternates between (previous) theory and empirical facts whereby both are successively reinterpreted in the light of each other" (Alvesson and Sköldberg, 2009, p.4).

In investigating how entrepreneurial teams actually form, this study employed a case study research strategy. A case study approach is chosen because of its potential to facilitate the identification and discovery of new patterns and relationships by providing rich, processual and contextual data (Pettigrew, 1990; Van de Ven & Poole, 2005). Such empirical description and contextualization is important in this thesis because I have investigated the formation of ETs in science-based industries, particularly in life sciences, where the level of uncertainty and

[6] This chapter describes the research methodology used in the three papers that constitute this thesis. I explain the choices I made and the steps I followed throughout the research process. Thus, it is the expanded version of the methods sections of each paper. This means that there is a considerable overlap between this chapter and the methods sections in the three papers.

complexity in entrepreneurial activities is very high. Thus, a case study research design allows me to contextualize the research and address the complexity of the phenomenon by placing the ETs "within their natural settings to understand their origins and forms" (Zahra et al., 2014, p.480), instead of controlling for contextual factors. Indeed, when the boundaries between a context and a phenomenon are not clear, case study research is appropriate (Yin, 2014).

Although a case study approach could involve a single case, I have chosen a multiple case study design for two reasons. Firstly, it allows replication of findings and makes the theory building more robust (Eisenhardt, 1989). Secondly, abductive research requires multiple cases as "abduction is not logically necessary, and must be controlled against more cases" (Alvesson & Sköldberg, 2009, p.5). These choices related to cases are further elaborated later in this section (section 3.3) and in each of the papers.

To build the cases and evidence facts, we used first-hand narratives from ET members and enablers, complemented and supplemented by data from secondary sources. Thus, epistemologically, I took an interpretative position in studying the formation of ETs. I assume that team entrepreneurship and/or entrepreneurial team formation is a socially constructed phenomenon by its team members and other actors within the context. As a researcher, I thus took on the role of interpreting the first-hand accounts and narratives of ET members and other informants who had been involved in the process. During the interviews, we deliberately avoided asking normative questions about team formation but rather posed questions to stimulate our informants to tell us more on how their entrepreneurial journey unfolded. The data collection process is elaborated later in this section. The following Table 5 provides an overview of the method(s) used in the three papers included in this dissertation.

Table 5. Overview of method(s) used in the three papers constituting the dissertation

Paper title	Data	Method
Why do we know what we know about entrepreneurial teams? Unlocking implicit assumptions in entrepreneurial team research	Published literature: 82 articles and papers from 29 different journals, conference proceedings and working papers.	Systematic literature review; problematization
How do entrepreneurial teams form? On mechanisms leading to entrepreneurial team formation	Data from four cases; primary data from ET members through interview; secondary data from company websites, LinkedIn account of ET members, the business search engine Proff.no, minutes and memos from the companies created by the ETs, and other published materials.	Abductive multiple case study
Entrepreneurial team formation practices in academic spinoffs: when the rules of the game are changing and players evolve	Data from seven cases; primary data from key informants, ET members, and former and current CEOs of tech transfer offices through interview; secondary data from LinkedIn account of ET members, the business search engine Proff.no, minutes and memos, and other published materials.	Abductive multiple case study

In the following sections, I provide a detailed account of the methods for the systematic literature review and the multiple case studies. For the sake of clarity and simplicity, the procedure followed in conducting the systematic review is presented first. The process, otherwise, has been iterative, where data were collected and analysed while reading the relevant literature and writing the systematic literature review.

3.2 Systematic literature review

When beginning the field work for this research in 2013, we carried out interviews with key informants who were knowledgeable about the life sciences industry in Norway and had been (were) working for organizations engaged in providing support for ventures in the industry. The aim of the interview with key informants was to understand the empirical context. Concurrently, I started examining the profiles of life sciences ventures in Norway by collecting data from secondary sources such as cluster member lists, research reports and published papers. Our analysis of these data revealed that many of the entrepreneurial ventures in the industry are founded by teams (Jevnaker & Misganaw, 2015). This triggered my curiosity and interest to further read what the literature says about teams in entrepreneurship. Consequently, to become better acquainted with the topic, I started conducting a systematic review of the extant literature on ETs.

The aim of the review was not only to systematically review and summarize what we know about ETs, but also to question why we know what we know about ETs and to identify some of the assumptions embedded in the literature on ETs through problematization (Alvesson & Sandberg, 2011). Problematization methodology has the potential to lead to the identification of more interesting research questions in a given field (Alvesson & Sandberg, 2011). Furthermore, questioning assumptions in existing theories is necessary because "it sees the stage to consider alternative causal chains and counterintuitive findings" (Zahra, 2007, p.448). In the following subsections, I explain how the review has been done, including the steps followed in selecting the relevant literature as well as extracting relevant data from the reviewed papers. Further discussion on the identified implicit assumptions and what they mean to theory is provided in Paper I.

3.2.1 Steps followed to select relevant literature

At the beginning of the literature selection process, I considered two alternatives to find papers related to ETs. The first option was to select a specific publication outlet, be it a journal, a conference or a book, based on attributes like ranking, geography or publisher. It was then

possible to cover relevant papers published in some specific journals, usually top ranked journals. However, since most highly ranked journals cover a relatively broad subject area, they may not publish a lot of research on one specific subject matter. Therefore, to cover as many manuscripts as possible, I followed the second option, which was to use one specific database to access publications in different journals in the field of team entrepreneurship. Accordingly, I chose the Business Source Complete database to search for publications related to team entrepreneurship.

To identify potentially usable manuscripts on Business Source Complete, I used four different keywords: entrepreneurial team, founding top management team, new venture team and team entrepreneurship. Those different keywords were chosen because researchers in the field seemed to be using the terms interchangeably (Klotz et al., 2014). The keywords were searched in the title, abstract and keywords sections of each manuscript. Consequently, the search ended with 210, 59, 119 and five manuscripts with the keywords entrepreneurial team, team entrepreneurship, new venture team and founding top management team, respectively.

To distinguish manuscripts for further analysis, I followed a two-step screening process. In the first step of screening, duplicate manuscripts (manuscripts that appeared under more than one keyword used for the search) and periodicals were identified and eliminated from the second part of the screening process. This brought the number of manuscripts down to 149, 31, 62 and four using the keywords entrepreneurial team, founding top management team, new venture team and team entrepreneurship, respectively. During the second step of screening, I went through the abstracts and conclusions of the manuscripts to check whether or not their focus was on entrepreneurial teams/team entrepreneurship. Eventually, 82 manuscripts that passed the screening processes were systematically summarized and analysed in the review. The manuscripts comprise a wide range of papers from more than 29 different journals, conference proceedings and working papers.

Based on the broad methodological choice they follow, the 82 papers reviewed are classified into four types: empirical quantitative studies, empirical qualitative studies, theoretical papers with propositions and theoretical papers without propositions. The majority of the papers, 60 (73%), fall under the first category, while ten (12%) were empirical qualitative papers. Thus, the total number of empirical papers considered in the review is 70 (85%). Of the remaining twelve, eight were theoretical papers and four were theoretical papers with propositions. In terms of their geographic focus, 33 papers with empirical data have used data

from the US, 33 were sampled from Europe, and 12 from the rest of the world. The total number of countries is 78 because some studies used data from multiple countries.

How does this selection contribute to the literature on ETs and, particularly, what makes it different from other reviews conducted in the field? Firstly, the method I followed led to a more extensive literature coverage than previous reviews that utilized a different technique to find publications (for example, Klotz et al., 2014). Secondly, the aim, and consequently the conclusions and discussions in the paper, are different from the other review papers on the topic. The aim of previous literature reviews was to summarize what had been studied in the field and identify gaps that needed to be filled in the current literature. Even though identifying gaps "consists of a complex, constructive, and sometimes creative process" (Alvesson & Sandberg, 2011, p.249), underlying assumptions characterizing a given topic of research need to be challenged to generate even more interesting research questions (Alvesson & Sandberg, 2011). To this end, the literature review paper in this thesis not only summarizes past research and spots some gaps, but also identifies and challenges taken for granted assumptions that characterize the prevailing research in the field of team entrepreneurship.

3.2.2 How reviewed papers were summarized and analysed

Since the aim of the systematic review was not only to summarize the findings of previous studies, but also to discuss why we know what we know about ETs by identifying some implicit assumptions embedded in the extant research, the data extracted from each paper are not limited to the findings of the studies. The following Table 6 summarizes the main headings used to extract the data as well as what type of data (and why) are summarized under each heading. Once the summary was completed, the manuscripts were grouped based on their focus and research questions under two sections and two subsections (please see Paper I for the detail). Based on the findings, the paper discusses three implicit assumptions embedded in the extant literature. The paper further discusses the theoretical implications of changing these assumptions and the methodological challenges related to studying ETs with the changed assumptions.

Table 6. The type of data extracted from the selected papers and why

Heading	What type of information is summarized and why?
Type of manuscript	Four types of manuscript have been identified based on the type of data and the composition of the papers: qualitative with empirics, quantitative with empirics, theoretical paper, paper only with hypothesis
Operational definition used	How ETs are conceptualized for the purpose of the papers. This includes data about which individuals are considered as part of the ET, and from which individuals data was collected. For example, an extracted information may appear thus: "… two or more individuals who jointly own and work in the firm from its inception"; or "…No single definition has been mentioned in the paper. However, the authors mentioned that the list and experience of the ETs have been taken from the document published when the ventures went IPO", etc.
Research question	The research questions posed in the research are summarized. This helps to understand what kind of problem the papers address.
Main focus (theme)	The general focus of the papers is briefly summarized. This helps to understand the broader aim of the papers as well as to see which aspects of ETs are covered in the studies. An extract in this section may appear thus: "… the main focus is on ET diversity and exit of members …"; or "…focuses on the impact of ET demographic heterogeneity on venture performance …"
Theoretical orientation or perspective	This section summarizes the theoretical positioning of the papers. An extract here may appear thus: "the resource based view", "the upper echelon perspective", "no specific theory but the literature on academic entrepreneurship", etc. This helps to understand the theoretical lenses used to address the research questions and the type of theme investigated, which complements the data summarized in the research question and main focus columns.
Country	The country where the data has been collected is summarized under this column.
Industry where the data is collected	The industry from which the data is collected has been summarized. This helps, among others, to see if papers have made an attempt to differentiate between teams depending on the sectors in which the ETs are operating. An extract may appear thus: "High tech such as advanced manufacturing, IT, biotechnology, pharmaceuticals and automotive technology", "Biotechnology", "No specific industry, but ventures founded between 1983 and 1988, that issued IPOs while they were not more than 6 years old", etc.
Method	This summarizes the method followed in the studies, including how data was collected, what type of data was collected, from whom, and for how long. This helps to understand, among others, which time or period in the life of ETs is covered in the studies. The data here also supplement/complement the data summarized in the research question and main focus section.
Findings	Here the findings of each study are summarized.
Future suggestions	This column summarizes the thoughts of the authors of the papers regarding future research areas that could be developed based on the findings in their research. An extract would take a question format, for example: "How and why do individuals or groups decide to seek one or more partners in order to implement the business concept?" or just suggest a theme — for example, "future research could explore the evolution of new venture teams".
Additional notes	In this column, additional information that is not summarized in the other columns but which is important for the analysis is summarized. This includes the definition of some terms used in the articles; for example, "…Biotech startups are defined as dedicated biotech firms, active in research and development …"

The resulting data from the summary revealed patterns in the literature at two levels: in terms of findings and implicit assumptions. These patterns are discussed in Paper I.

3.3 The empirical studies

From the systematic literature review, it became clear that there is limited research on the formation aspect of ETs. In fact, ET formation is one of the long-standing research agendas in ET research (Cooney, 2005; Forbes et al., 2006; Harper, 2008; Kamm et al., 1990; Schjoedt et al., 2013). Thus, the starting point for the empirical studies was an attempt to understand how ETs form by taking the life sciences industry as an empirical context. The aim was neither to test or verify existing theories nor to develop a theory in a purely inductive way. We were collecting and analysing the empirical data while reading different theoretical perspectives that helped us to understand the phenomenon under investigation — the formation of ETs. Thus, I adopted an abductive qualitative case study research design.

I chose a qualitative research method because it is appropriate for a research addressing 'how' questions as well as "for understanding the world from the perspective of those studied (i.e. informants), and for examining and articulating processes" (Pratt, 2009, p.856). Because of the nature of the research question, the study follows a processual approach. Indeed, the broad research question 'how do entrepreneurial teams form in science-based industries?' asks for a processual approach, as it is concerned with how things are formed, how they develop over time, and why they develop the way they do (Langley, 1999). By process, I refer to the unfolding and progression (the order and sequence) of events that describe how things change over time (Van de Ven, 1992; Van de Ven & Poole, 1995, p.512). This design also responds to the growing need and call for processual studies in the team entrepreneurship literature (Forbes et al., 2006; Klotz et al., 2014) to understand ETs and team entrepreneurship better by complementing the dominant variance research. The phenomenon covered in this research, team entrepreneurship, is conceptualized as a process consisting of different events and actions occurring within a certain period. The empirical insights were gathered by using a case study approach. As argued by Yin (2003), a case study method is appropriate, among others, when the desire of a research is to cover not just isolated variables but also contextual or complex multivariate conditions through an in-depth analysis of the phenomenon under investigation.

3.3.1 Case study research and case selection

Considering the limited knowledge in the extant literature regarding the formation of ETs, a qualitative case study research design is chosen to develop new insights and perspectives to come up with a new/alternative explanation on the formation of ETs. A case study is "a study of the occurrence of a phenomenon — a chain of events, usually limited in time, usually studied

retrospectively" (Czarniawska, 2014, p.21). To make the theory-building stronger, a multiple case study is deployed, as suggested by Yin (1994) and Eisenhardt and Graebner (2007). A multiple case study approach helps to provide evidence that is more compelling and robust (Yin, 2014). In addition, since cases had to be selected to "either predict similar results (a literal replication) or predict contrasting results but for anticipated reasons (a theoretical replication)" (Yin, 2014, p.57) in multiple case studies, the approach enabled me to find additional cases to confirm the emergent relationship and disconfirm cases to extend the emerging theories (Eisenhardt, 1989, p.542).

The case selection procedure was theoretical or purposeful sampling (Eisenhardt & Graebner, 2007). This approach is appropriate because the purpose of this research is to provide new/alternative insights into the understudied topic of ET formation — i.e. not to test or verify any theory, but to develop. In order to identify real-world cases of ETs, the following three criteria have been used:

a) Life sciences/biotech companies that are working or have been working on something potentially new.
b) The venture or the idea behind the venture should have been developed by more than one person, preferably including 'serial entrepreneurs' in order to provide rich data on the change in the support system over time.
c) In addition, it was preferable to identify enterprises where the originators and founder(s) are/were active until recently, to provide first-hand accounts of rich experiences relatively fresh in the memory.

To identify these theoretical cases, we consulted key informants, life sciences cluster members list, industry databases, as well as websites and reports from different institutions. In addition, a snowball sampling technique (Bernard, 2011) is applied to identify more cases that fulfil the abovementioned criteria. We continued this process up to the point where the same cases were mentioned by several informants and names started recurring, which led to a list of 19 potential cases. The final set of cases considered in this study is seven. We stopped adding more cases when we started observing a relatively similar pattern in the newly added cases as compared to the previous ones (Eisenhardt, 1989).

3.3.2 Data collection

Overview of the data collection process

One of the important tasks during the data collection process was to decide on who constituted each ET and whom to interview. While conducting the systematic literature review, I realized that different authors used different criteria to delimit the boundary of the team — i.e. what individuals need to fulfil to be considered as part of the ET. Ownership, role in the venture and financial commitment were among the variables used to distinguish ET members. However, each of them may have its own limitations and it was not an easy task to develop some criteria.

After critically reviewing and discussing the different criteria used in the literature, I decided to consider those individuals who were behind the original business idea that made up the entrepreneurial venture as part of the ET. During the initial interviews with ET members in the selected cases, however, we found cases where the idea behind the venture had evolved into a different idea through the involvement of individuals who joined the team after some time — i.e. the original idea was no longer in the venture, but the improvised one had superseded it. If the original definition set at the beginning of the research had been kept, those individuals who helped in transforming the initial idea would have not been considered as part of the ET. Through an iterative process of going back and forth between the criteria used in the literature and the initial findings, we developed four criteria (Jevnaker & Misganaw, 2015). Thus, as a working definition, an entrepreneur shall fulfil at least three of the following four criteria in order to be considered as part of an ET and eligible for interview in our study: a) is involved in creating the business idea; b) holds an equity in the venture; c) is involved in jointly transforming ideas into enterprise conceptions; and d) was part of the team before the development of the first product, used as a base for creating the initial means-end framework of the venture.

In terms of temporal orientation, the collected data were mostly past-oriented — i.e. focused on tracing the ET formation in retrospect. We identified ETs who had commercialized or were working towards commercializing their business ideas but had not necessarily succeeded (at least up to the time of data collection), and looked retrospectively through different data collection mechanisms. This strategy can be "affective and effective so long as accurate temporal chronologies can be reconstructed using a data from archival sources or extensive interviewing" (Langley, 2009, p.414). We used both sources and followed a temporal

chronology in each interview. The relatively modest time requirement facilitated replication across comparative cases (Langley, 2009).

To achieve the research objective, collecting data by using ethnographic methods (that is, to follow the ET pre-formation, during formation and post-formation on a real-time basis) would have been ideal. When things are interactive and messy, explorative phenomenological or ethnographically inspired research could be appropriate (Hoholm & Araujo, 2011). This approach, however, has its own challenges in terms of being operationalized in this thesis. Among others, the first challenge is related to time and other related resources (Langley, 2009). Since it is not possible to predict how long the ET formation and development may take, the research would need to have an open time frame. Secondly, it may also be difficult to follow the informal meetings and discussions between ET members, partly because informal meetings may not necessarily be scheduled in advance and one cannot know what is actually going to happen in those meetings. In fact, the chance of spotting and identifying ETs pre-formation seems very difficult, if possible at all. Thus, tracing them backwards after their formation or when the formation has passed a certain stage seemed a plausible strategy.

As a data collection instrument, we used face-to-face interviews, supplemented and complemented by secondary sources including memos, minutes and agreements involving ET members and their ventures. In addition, we attended industry seminars and conferences to gain further insights into entrepreneurial activities in the sector. The opportunity to use many different sources is one of the strengths of a case study approach (Yin, 2014). Using at least two ways of collecting data also facilitated data triangulation (Patton, 2002). The data collected are thus largely in the form of narratives about what happened, who did what, and when — that is, events, activities and choices ordered over time (Langley, 1999). The following table presents a summary of the types of data collected with the respective purpose.

Table 7. Summary of data sources and purpose

Method	Data source	Purpose
Key informant interview	Interviews with key informants (all experienced industry experts)	- To get an overview of the sector in Norway - To identify potential ET cases working in the sector
Topical interviews	Semi-structured interview with ET members Semi-structured interviews with former or current CEOs of support organizations in the region	- To obtain data regarding how the teams were formed and developed over time - To obtain data regarding the role of institutional actors in the formation of ETs in the setting - To identify further potential ET cases working in the sector
Secondary sources (topical)	Websites, memos, minutes and agreements involving the ETs and their ventures	- To complement the data obtained through the topical interviews
Secondary documents (overview)	National policy documents, industry research reports	- To acquire knowledge about entrepreneurship in the life sciences industry in Norway
Participation in seminars and conferences	Seminars and conferences attended: listening to presentations of research reports, company presentations, discussions about the status of the sector; informal discussion with participants	- To acquire knowledge about entrepreneurship in the life sciences sector in Norway - To identify and approach potential ETs for the research

Interviews

Because of the temporal orientation of the data required to achieve the research objective, we used interviewing as the main data collection instrument. The interview in fact suits a research that has an explanatory or exploratory element, especially when a researcher wants to know the meanings that respondents ascribe to a phenomenon and when the questions are complex or open ended. The topical interviews with ET members in our study were semi-structured, while the interviews with key informants were open. For this thesis, I chose semi-structured and open interviews because structured or closed interviews may limit the conversation to very specific topic and hence may lead to missing other relevant information about the cases under investigation (Czarniawska, 2014).

I started the research interview preparation by thematising (Kvale, 1996) the topic of interest, the formation and development of ETs, with the support of an extensive literature review. Thematising involves "a conceptual clarification and a theoretical analysis of the theme investigated, and the formulation of research questions" (Kvale, 1996, p.89). Once the broader topics were identified and data were collected from key informants through open-ended interviews, I prepared a semi-structured interview guide (designing stage; Kvale, 1996) for the

interview with members of the selected ETs (see Appendices 1 and 2 for the full interview guides). The list of themes covered during the interviews included, but were not limited to:

- Background information related to the individuals and the ventures
- The venture idea and formation of the team
- Individuals/institutions/stakeholders involved in the formation process
- Entry and exit of members
- Mode of operation of the team
- Ownership and financial structure
- Roles of team members

Although the questions in the interview guide were sequential, the order was not followed strictly during the interviews. This allowed our informants to share their experiences and narratives in the story line freely. However, we made sure that all the themes outlined in the interview guide were covered by the end of each interview to facilitate comparison among cases, as well as among interviews within each case. In almost all of the interviews, two researchers (me and my supervisor) were present, which allowed active probing and follow-up inquiries.

In some of the selected cases (whenever possible), we interviewed at least two members of the ET with the aim of getting as much information as possible from different informants, while in some we interviewed only one member of the ET but supplemented and complemented by extensive use of secondary sources. In order to reach the selected cases, we sent several e-mails requesting meetings, followed by a site visit once we received a positive response from informants to be part of our study. Access to informants, however, was not easy, and sometimes we were aided by our social network, including family connections. This underlines the challenges of doing multiple qualitative case studies in complex science-based contexts where entrepreneurs might not be willing to share their experiences because of confidentiality of some of the data they are working on.

Before we went to interview our informants, we prepared a brief description of each case. Most of the information used to prepare the cases was derived from secondary sources, including the website of the venture and LinkedIn accounts of the informants. That helped to familiarize us with what our informants had been and were currently doing. During the interviews, we also asked about their current and previous positions and work history, in addition to our inquiries related to the team. Interviews (actual interviewing stage; Kvale, 1996)

were conducted on site, either in offices of our informants in hospitals, the ventures' labs or at the university where our informants were working. In most cases we had a chance to visit their labs and working environment right before or after the interview, which gave us the opportunity to meet some of the individuals mentioned during our interviews. This enhanced our trust and confidence in what we found during the interviews.

Each interview, on average, lasted between one hour and 30 minutes and two hours. In some cases, the interview lasted for three hours. During the interviews, we used a probing technique to encourage respondents to speak more about a critical event and to get the most possible information out of the interviewees. This was done, for example, by asking questions like: "Could you tell us more about your first meeting please?" We also asked follow-up questions and used analytical probing in relation to existing theories and assumptions, as suggested by Kreiner and Mouritsen (2005). For example, we introduced competing concerns in our follow-up questions rather than seeking a reconfirmation of a line of thought, to get more insights and data out of the interviews. This process was fostered by the participation of two interviewers, my supervisor and me, in almost all interviews. To ensure that relevant contextual data were accessed and to guide against language barriers, it was beneficial that my supervisor (as co-researcher) was involved during the interviewing process. This collaborative research effort, combined with our background difference, allowed us to view the cases from different perspectives (Eisenhardt, 1989).

Right before the interviews, we advised all our informants about the possibility that their views could be anonymized. We also assured them that we were interested in what had actually happened. This helped to reduce the anxiety and potential bias that they may have had towards the answers they gave to the interview questions. All the interviews were tape-recorded with the full consent of the respondents. The interviews were fully transcribed (transcribing stage; Kvale, 1996). I did the transcription within a short period of each interview (between one and two days), while memories from the interview were fresh. The following table summarizes the type and length of interviews we conducted.

Table 8. Overview of interviews conducted

Type of interview	Type of Interview	Number of Interviews	Interview duration Hours: Minutes (Average/Total)
Interview with key informants	Open	5	1:34 / 7:50
Topical interview with ET members	Semi-structured	9	1:50 / 16:26
Topical interview with former and current CEOs of institutional actors	Semi-structured	4	1:31 / 6:03
Total		18	1:41 / 30:19

Secondary sources

In addition to the interviews, we extensively collected data from secondary sources. Document types included minutes, press releases, annual reports, company websites (accessed on different dates over a period of three years), presentations for external and internal audiences, patent registries, national registry of firms, LinkedIn accounts of the people involved in the ventures at different times, and publications about the ventures in third party reports/websites. The data collected from secondary sources served different purposes during the early and later stages of the research process. During the early phase of the research, the aim of the data gathered from secondary sources was to understand the empirical context, particularly how the entrepreneurial activities in the sector were organized, and learn more about potential cases for further investigation.

In the later stage of the research, data from secondary sources were used for triangulation purposes (Patton, 2002; Yin, 2014). For instance, the data we found from the LinkedIn accounts of ET members and the company websites regarding who joined when were in line with the data from interviews. In addition, secondary data were beneficial to supplement and complement the data collected through interviews. The data collection process was not linear, where one type of data preceded and another followed: data were collected from different sources in parallel, while analysing those already collected (see Appendix 3 for an overview of the secondary data sources). The following section discusses the data analysis procedure followed in this thesis.

3.3.3 Data analysis

To organize the data systematically and prepare it for further analysis, I used narrative and visual mapping strategies (Langley, 1999). A narrative strategy involves the construction of a detailed story from raw data (Langley, 1999) and is usually considered as the first task in qualitative inquiries (Patton, 1990). This is somehow similar to what Eisenhardt (1989) labelled

'within case analysis', an analysis that involves a detailed case study write-up. I chose this strategy because its accuracy is expected to be high (Langley, 1999). The strategy is also beneficial to identify emergent themes in the data, because the narratives include a description of the chronology of events, who did what and when, and how the interactions between team members and other stakeholders shaped the emergence of the team with the respective outcomes of the interactions. The possible drawback here is that the conceptual contribution could be thin. Thus, to supplement this, a visual mapping strategy was deployed to present a large number of dimensions simultaneously and to look at parallel processes over the passage of time (Langley, 1999).

In the analysis, we "searched for patterns in the data and for ideas that help to explain why those patterns are there in the first place" (Bernard, 2011, p.338). To facilitate the within-case analysis, an explanation-building technique (Yin, 2014, p.147) was used "to stipulate a presumed set of causal links", in particular to understand how and why entrepreneurial teams were formed. In most cases, explanation-building occurs in a narrative form. As suggested by Yin (2014), the explanations reflect some theoretically significant propositions, which helps to improve the level of precision of the analysis. We also analysed the data across cases to find patterns. For example, in Paper II, the cross-case analytical discussion that includes propositions is provided in the analytical discussion part that follows the within-case narratives (see Chapter 5 for details).

In collecting, organizing and making sense of process data, the use of multiple investigators is advantageous in terms of enhancing the creative potential of the study and increasing confidence in the findings. In this regard, Papers II and III benefitted from investigator triangulation (Patton, 2002, p.247). In conducting the analysis for those papers, we worked back and forth between our empirical data and existing theories on entrepreneurial teams. We did this by mapping our analysis visually on whiteboards and writing memos, tables and charts which we both individually and jointly explored and reflected upon. To identify and address rival explanations for findings (Yin, 2014), we pushed our understanding by constantly asking, 'what is going on here?' (Kvale, 1996).

Further analysis of the data was conducted by using a template analysis (King, 2004) technique. According to King (2004, p.256), "the essence of template analysis is that the researcher produces a list of codes ('template') representing themes identified in their textual data. Some of these will usually be defined a priori, but they will be modified and added to as

the researcher reads and interprets the texts." To conduct the template analysis, we first developed a list of themes based on the interview guide utilized to collect data, which in turn was informed by the prevailing literature on ETs. Because the interview guide was semi-structured and additional insights were found during the interview, the template was revised as we read and re-read the interview transcripts.

When coding the data, we used different types of coding as required in different phases of the analysis. In those circumstances where the actual language used by respondents needed to be kept, we used an in vivo coding technique (Saldaña, 2015). For instance, we coded the following statement "[The first CEO] was, I would say, quite heavily pushed by the first venture capital man [invested in the venture]" as "heavily pushed". These codes were included in the narrative writings in the within-case analysis. During the cross-case analysis, codes with similar theoretical implications were then further coded together. This helped to preserve the meaning of the participants' views (Charmaz, 2006). Process coding was also utilized on some occasions since it is a suitable technique to capture an "ongoing action or interaction in response to situations with a purpose of reaching a goal" (Corbin & Strauss, 2008, p.96). For instance, in the following excerpt, the first part is coded as "adding new CEO — establishing own lab" and "re-arranging position", while the second is coded as "adding new CEO — international funding".

> When we had submitted a patent and we had established the laboratories here and we were going to start clinical trials, then we wanted to hire another CEO and the current CEO became a CSO [….] and now we are in a process where we want to get funding from international investors. And then, we wanted a person who has worked with big biotechnology companies, international companies and has a network and contacts with investors.

As a platform for conversation with me regarding the data, I used analytical memo (Clarke, 2005) to document my reflection throughout the data collection and analysis process. The scope of the issues documented in the analytical memo ranges from reflection on the study's research question to reflections on emergent or related existing theories (Saldaña, 2015) from the analysis. I also regularly discussed with my supervisor the reflections in the memo to understand how the reflections in the notes could substantiate some of the arguments in the papers.

3.4 Limitations and trade-offs

Although case study research has an advantage over other methods in facilitating the exploration of relationships through rich and contextually embedded data, it has its own limitations and trade-offs (Eisenhardt & Graebner, 2007). The list of common limitations includes selection bias, informant bias and researcher bias (Eisenhardt & Graebner, 2007; Graebner et al., 2012). In this study, I have attempted to mitigate these limitations in different ways.

To reduce the limitation related to selection bias, we included ETs that were still under formation in our selection. In fact, only two of our cases had completed their formation, which we link with the establishment of a means-end framework for the new venture. The means-end framework is said to be established when the venture has completed its main product/service and started commercializing it. In most of our cases, the ventures were at some stage of product development, where the business idea was still evolving and hence the means-end framework was not yet fully developed. As a result, neither the team not the venture was fully formed and hence not yet 'successful'. Even if we use other criteria that are common in the literature, such as sales, profit and growth, most of our cases would fall under 'unsuccessful' ventures since they did not have sales or growth.

Another potential limitation is related to informant bias. The retrospective method of asking ET members to recall events in the past has inherent limitations, which may lead to a bias from interviewees or informants (Creswell & Miller, 2000; Eisenhardt & Graebner, 2007). To mitigate this potential limitation, we used different strategies. Firstly, when possible, we interviewed more than one ET member in a team. We also interviewed former and current CEOs of support organizations in our research setting to triangulate the data across informants. Secondly, we used triangulation across data sources by collecting and analysing data from secondary sources. Thirdly, we were careful in phrasing our questions and kept the tone of the questions neutral and explorative. We tried to avoid the use of concepts or categories that may have influenced the way our informants responded to the questions.

To address the potential bias that may occur from the researcher side, which could particularly be related to decisions on data maturity and the establishment of categories or concepts, we used an investigator triangulation technique (Creswell & Miller, 2000). In addition, as suggested by Creswell and Miller (2000), I used the technique of researcher reflexivity by disclosing my assumptions and beliefs in conceptualizing entrepreneurship and

the overall theoretical positioning of the research. Furthermore, we exposed our work for critique and received feedback by presenting the earlier version of the studies at international conferences and seminars on entrepreneurship. This helped to test some of our ideas and assumptions and to improve them based on the feedback we received.

3.5 Concluding remarks on methods

In this thesis, I attempt to develop new insights about entrepreneurial teams and their formation. In doing so, I have employed a mix of methods as described in this chapter. As mentioned earlier in the chapter, this study followed an abductive research process where we iterated between theory and data. It is important here to note that the choice of theoretical perspectives was not made from the start. I was rather open in reading different theoretical perspectives that could illuminate our empirical data until we identified the three streams of literature — literature on ETs, organizational imprinting and academic spinoffs — as valuable perspectives to shed light on the research questions we posed in the papers.

By exploring the formation of ETs using these three streams of literature and an abductive multiple case study method, I have attempted to theorize the formation of ETs as a process that is shaped by the setting where the formation is taking place. This aspect, surprisingly, is overlooked in the extant literature that portrays entrepreneurial teams as more or less similar, irrespective of their sectoral or spatial context. The remainder of this dissertation attempts to challenge the extant literature by pointing out and discussing some of the implicit assumptions embedded in the extant literature, identifying some of the mechanisms leading to ET formation, and highlighting the importance of context in ET formation through three research articles and a concluding discussion.

The papers of this dissertation (pages 49-149) are not available open access, due to copyright matters.

Paper 1
Why we know what we know about entrepreneurial teams? Unlocking implicit assumptions in entrepreneurial team research
Misganaw, B. A. (2018) *International Journal of Entrepreneurship and Small Business, Vol. 33, No. 3, pp. 354-379*

Paper 2
How do entrepreneurial teams form? On mechanisms leading to entrepreneurial team formation
Misganaw, B. A. & Jevnaker, B. H.
Earlier version presented at the 2015 NORSI Conference, Trondheim

Paper 3
Entrepreneurial team formation in academic spin-offs – when the rules of the game are changing and players evolve
Jevnaker, B. H. & Misganaw B. A.
Earlier version presented at the 2nd Entrepreneurship as a practice workshop, 2017, Dublin, Ireland

7 Discussion and conclusions

In this chapter, I discuss and integrate the findings from the three papers constituting this dissertation. First, I provide a summary of the findings from each paper; then I synthesize and discuss the implications of the findings for three different streams of literature. Subsequently, I discuss the practical and policy implications of the findings. Finally, I present some of the limitations of this study and suggest some future research avenues.

7.1 Summary of findings

The aim of this study was to contribute to our understanding of entrepreneurial teams by investigating their formation in science-based industries. To this end, we attempted to answer three independent but interrelated research questions in three separate papers. We followed a mix of methods, including a systematic literature review and multiple case studies, to address the research questions.

In Paper I, I conducted a systematic review of the extant literature on entrepreneurial teams (ETs). By answering the research question 'why we know what we know about entrepreneurial teams?', the aim of the paper was not only to summarize the literature and identify future research avenues, but also to unlock some of the implicit assumptions embedded in the prevailing research on ETs. Consequently, I identified three implicit assumptions that may partly explain the inconsistent results in the literature and may have also partially hindered the development of a comprehensive theory of ETs. The three assumptions are: a) ETs can only be studied in relation to venture level variables; b) all ETs are the same; and c) there is a lead entrepreneur in all ETs. Because of these assumptions, I argue, more emphasis has been given to ETs and the exploitation of entrepreneurial opportunities; hence the opportunity creation/identification process is overlooked. Moreover, the assumption that there is a lead entrepreneur in all ETs left ETs without a lead entrepreneur understudied and in a shadow. The paper also discussed how changing these assumptions may open up new research avenues and its implications for theory. Furthermore, I reflected on methodological avenues and challenges related to studying ETs in their natural setting throughout their entrepreneurial journey.

In Paper II, we addressed one of the understudied areas in ET research, ET formation. The paper posed two explorative research questions: How do entrepreneurial teams form in science based industries? What are the mechanisms leading to their formation? Based on the findings from our multiple case study, we conceptualize ET formation as a process involving at least two periods where the mechanisms shaping the formation differ depending on which period of

the formation process the ET is in. In the first period, the initial ET is formed because of an output from a previous shared work, where the output implicitly creates a binding factor among the initial ET members. In the early phases of the second period, institutional actors influence the process sometimes by imposing their choices on the initial ET. The findings of this study challenge the existing views of ET formation in the literature and provide an alternative explanation for ET formation in science-based industries. In addition, we developed six propositions related to how ETs form (Aldrich & Kim, 2007; Ruef et al., 2003), the mechanism leading to their formation (Ruef, 2010) and position imprinting (Beckman & Burton, 2008; Burton & Beckman, 2007) in ETs. We further discuss the relevance of the findings to the literature on ET formation and the theory of organizational imprinting.

In Paper III, we investigated whether and how ET formation in academic spinoffs (ASOs) is affected by institutional factors, specifically, changes in the way technology transfer activities are organized and regulations governing the commercialization of research in public research institutes. Through a multiple case study of ASOs in the life sciences sector in one region in Norway, we identified three groups of ETs that formed in different ways. Drawing on the theory of organizational imprinting (Stinchcombe, 1965), we found that the way ETs are formed and their composition in the three groups in part mirrors the social conditions at the time of forming, specifically the way technology transfer was organized and the regulations that governed the commercialization of academic research. We further identified direct and indirect mechanisms through which these conditions are imprinted on the teams. By relating the findings to the extant theoretical explanations of ET formation, we suggest that an 'institutional view' of ET formation (Forbes et al., 2006) may need to be considered as a central part of the literature. The findings also suggest that research on ETs in ASOs may need to consider the sectoral context in which the teams and their ventures are operating.

In sum, the findings from the three papers have implications for the literature on entrepreneurial teams and organizational imprinting, while Papers II and III also contribute to the literature on academic entrepreneurship. In the following sections, I discuss the implications of the findings for these streams of literature.

7.2 Theoretical contributions/implications

7.2.1 Literature on entrepreneurial teams

This study makes several contributions to the literature on entrepreneurial teams (ETs). Firstly, it identifies and discusses some of the implicit assumptions that may partially explain the

inconclusive and sometimes contradictory results (Jin et al., 2017; Jung et al., 2017) observed in the literature. Changing these assumptions, I argue, may have several implications for the literature.

One implicit assumption, for instance, is that ETs can only be studied in relation to performance variables at the venture level. In other words, as argued by Jung et al. (2017), the existence of the teams and the ventures is taken for granted and studies proceed to examine how differences in team composition and expertise drive venture level outcomes. Furthermore, since ETs are defined and identified in terms of the age of the firms they are working in and there is no single defined firm age to be considered an entrepreneurial firm, researchers have ended up studying ETs in ventures of different ages. The different firm age limits used in the literature include one to twelve years (Bach et al., 2008), two to five years (Forbes et al., 2006), three to five years (West, 2007), three to eight years (Zahra & Wiklund, 2010), three to ten years (Leung et al., 2013), five years and less (Vanacker et al., 2014), six years or less (Brinckmann et al., 2011; Shrader & Siegel, 2007; Vissa & Chacar, 2009), seven years (Bjørnåli & Aspelund, 2012), etc. As long as this variation continues to reflect in ET research, the results may remain inconclusive, which in turn may make comparisons across findings and theory building challenging. Thus, this study suggests that ETs be defined in terms of their relationship with the entrepreneurial opportunity on which they are building their new venture.

Researching ETs in relation to the entrepreneurial opportunity and their effort in creating the initial means-end framework of the new venture (Harper, 2008) may enable research on ETs to grasp the collective effort of ET members in building and co-creating their ventures. This will help to bring ETs back to the centre of the literature stream that conceptualizes entrepreneurship as a sequence of activities culminating in the creation of new organizations (Gartner, 1989; Ruef, 2010). Furthermore, the success or failure of the ETs will be seen in relation to the creation of the new organization (which is not merely about the legal registration of the firm), not the performance of the venture after a certain number of years. Once the initial means-end framework is created and the firms have remained in operation for three, five, eight or ten years, the question will be more about how they are managed. By relating the characteristics of the management team of entrepreneurial ventures, what most of the extant research on ETs seems to address is perhaps the application of the upper echelon perspective (Hambrick & Mason, 1984) in young firms. I concur with Martinez et al. (2011, p.21), who argued that the selection of firms instead of teams and individuals in entrepreneurship research may "obscure how entrepreneurship is really a social process with diverse participants".

Studying ETs in relation to the venture founding process, not only the venture level variables after some years, may also help to reduce the potential success bias in sample selection that could occur as a result of studying ETs after the ventures' means end-framework is established. If factors such as sales, growth, internationalization, etc. are used to study ETs, it may mean that the ventures created by the teams have some product or service in the market. This, in turn, implies that the ventures are at least successfully created and they are in the entrepreneurial opportunity exploitation phase. In the empirical studies in this thesis (Papers II and III), most of the cases we considered did not yet have either a product in the market or revenue generated from sales. In fact, we found that even the entrepreneurial opportunities that the teams are developing have been evolving over the years. Thus, their organizational building/creation/co-creation process is still ongoing and it is not yet known whether or not they will be successfully formed.

Secondly, this study also contributes to the literature on ETs by addressing one of the understudied aspects of ETs — their formation (Schjoedt et al., 2013; Zhou et al., 2015). Specifically, it documents how ETs form in academic spinoffs in detail by using first-hand narratives from ET members and other actors involved in the process. In addition, the study suggests that ET formation may not always be a strategic decision-making process where the lead entrepreneur(s) identifies, selects and recruits members based on either homophily (Aldrich & Kim, 2007; Ruef et al., 2003) or missing competence in the team (Aldrich & Kim, 2007; Forbes et al., 2006; Smith, 2007). We rather argue that the mechanisms in place throughout the formation process differ depending on the stage where the formation process is. Moreover, in Paper III, we zoomed in further and studied whether and how ET formation in academic spinoffs is affected by the social conditions at the time of founding. The study provides an indication that an 'institutional view' of entrepreneurial team formation may need to be considered as a central part of the literature on ET formation. In summary, the findings from Papers II and III emphasize the importance of the setting in explaining the formation of ETs.

Acknowledging the different ways that ETs form and further research in this line of enquiry, I contend, may lead to a typology of ETs based on how they form. This, in turn, may help to overcome the challenges caused by one of the implicit assumptions in the extant literature on ETs — that all ETs are the same. The only typology in the ET literature (to the best of my knowledge) is Harper's (2008) typology, where ETs are divided into five types based on the composition of the team. I suggest that another way of classifying ETs could be

the way they form, because the formation process is an antecedent for the ET's composition. Future research may also investigate if different ways of ET formation have a relationship with different aspects of team dynamics. The list of potential questions includes: What type of formation may increase the likelihood that teams develop faultlines between subgroups (Lim et al., 2013) within the team? Is it possible to predict the exit strategies of the team by looking at how it is formed?

7.2.2 The literature on academic entrepreneurship

This study makes a number of contributions to the literature on academic entrepreneurship. Firstly, it adds to the literature by studying the formation of entrepreneurial teams in academic spinoffs (ASOs). The theme is one of the least studied (Bjørnåli, 2009; Rothaermel et al., 2007) and a suggested future research area in the academic entrepreneurship literature (Siegel & Wright, 2015b). To this end, the study provides evidence on how a change in legislation and organization of technology transfer activities in parent institutes may affect the way ETs form in ASOs. Although institutional changes in terms of legislation and organization of technology transfer activities have been witnessed in different countries, there is limited research dealing with the influence that these changes might have in the early stages of the academic spinoff creation process (Fini et al., 2017; Fryges & Wright, 2014; Huyghe et al., 2014). The effects of the changes could be observed in different aspects such as resource endowments (Moray & Clarysse, 2005) or the number of spinoffs created (Di Gregorio & Shane, 2003). This study, however, focuses on the effects of the changes on the formation of ETs, because ETs are the bridges linking inventions or ideas developed by research institutes to the new spinoffs. Although the findings of this study imply that the changing configuration of the technology transfer activities affects the formation of ETs in ASOs, I suggest a comparative study to further validate the findings.

The second implication of our findings for the academic entrepreneurship literature is related to the question of which researchers are more likely to engage in entrepreneurial activities and why. The findings of this study suggest that junior faculty members are more active participants in the venture creation process than senior faculty members. In most of our cases, the juniors took a full-time position in the new ventures while the seniors kept their position in the universities and worked in the ventures on a part-time basis. This is slightly contradictory to Allen et al. (2007), who found that older and tenured faculty members are more likely to engage in entrepreneurial activity. Furthermore, we found that those junior

faculty members who are involved in the ETs behind the spinoffs full time either have (had) a position at a university/university hospital or had an offer to continue as a researcher, which is contrary to the findings of Rizzo (2015). Based on a study in Italian academic spinoffs, Rizzo (2015) suggested that junior researchers participated in creating new ASOs when they were unable to find a career in a university or other research institute. This suggests research in this line may need to consider the specific context in which the academics are working. This is in line with the recent call for more contextualized research in the field of entrepreneurship (Welter & Gartner, 2016).

To get a fine-grained analysis in this regard, I would argue, future research on academic entrepreneurship may need to differentiate between different types of entrepreneurial activity that academic researchers could be involved in and discuss which group of researchers is more likely to engage in which type of entrepreneurial activity. For instance, senior researchers could more likely engage in entrepreneurial activities such as collaboration with industry to develop a new product/service. Young researchers, however, may tend to become involved in entrepreneurial activities related to new venture creation. Future research may further develop and test these hypotheses with a larger sample size.

Finally, the study attempts to link organizational imprinting theory with the literature on academic entrepreneurship by identifying some of the mechanisms through which the configuration of technology transfer activities at the time of founding is imprinted on the formation and composition of ETs in ASOs. Although recent research in academic entrepreneurship utilized the theory to, for instance, understand future spinoff activity from ASOs (Ciuchta et al., 2016) or explore the role of capabilities and networks of founding teams on the performance of spinoffs (Huynh et al., 2017), the role of the founding conditions on the genesis of ETs in ASOs has been neglected. In fact, even in the general entrepreneurship literature, studies of venture teams have disregarded the theory (Guenther et al., 2016, p.844), although it has been used to explain other aspects of entrepreneurship (De Jong & Marsili, 2013; Leung et al., 2013; Mathias et al., 2015). We suggest that the theory of organizational imprinting and research on academic entrepreneurship could cross-fertilize: the theory of organizational imprinting could be a useful theory to understand the phenomenon of academic entrepreneurship, and academic entrepreneurship seems to be a fertile ground to test, generate new insights and further develop organizational imprinting theory.

7.2.3 Literature on imprinting

The findings of this study also have several implications for organizational imprinting theory. Firstly, the study extends the imprinting literature to the team level and suggests that ETs engaged in founding new ventures are imprinted by the social conditions at the time of formation. Research on imprinting largely focuses on the organization level (Guenther et al., 2016; Mathias et al., 2015) and considers founders only as imprinters or sources of imprints for new organizations (Beckman, 2006; Boeker, 1989; Simsek et al., 2015). This is probably because the literature mainly assumes imprinting begins at venture inception (Mathias et al., 2015). As a result of this, the genesis of imprinting is taken for granted by imprinting researchers and hence remains in a "black box" (Simsek et al., 2015, p.305). To understand the imprinting process better, research focusing on the decisive activities in the venture-founding process (Johnson, 2007) and their connection with the context has been suggested (Aldrich & Yang, 2012; Johnson, 2007). In line with this, considering up to 85 per cent of science-based ventures are founded by teams (Honoré, 2015; Wasserman, 2012), I argue that the imprinting literature may need to give more attention to entrepreneurial teams to understand better the genesis of imprinting. In Paper III, we studied how entrepreneurial teams formed in academic spinoffs and identified some of the direct and indirect mechanisms through which the social conditions at the time of forming may imprint on ET composition. By doing so, we have also contributed to the literature by addressing the 'how' question of imprinting, which has been suggested as a future research theme in the imprinting literature (Simsek et al., 2015).

Secondly, this study contributes to the position imprinting literature by suggesting that positions created in new ventures could partly be predicted by looking at how the entrepreneurial teams behind the ventures form. The findings of Paper II provide support for this argument. Assignment of positions at the time of founding is considered an important aspect of the initial structuring of an organization (Burton & Beckman, 2007; Jung et al., 2017), with a lasting consequence. If the first position holder has an atypical background, s/he is more likely to have created an idiosyncratic job with unusual tasks and responsibilities, making it more difficult for any successor to fit in the position and leading to a higher turnover rate (Burton & Beckman, 2007). Based on the findings of this study, I contend that ET formation could be considered as an antecedent for position allocation and creation. This is because how initial positions are created and negotiated could depend on the characteristics and preferences of the initial incumbents in the founding team (Burton & Beckman, 2007), which, in turn, could be a reflection of how the team is formed.

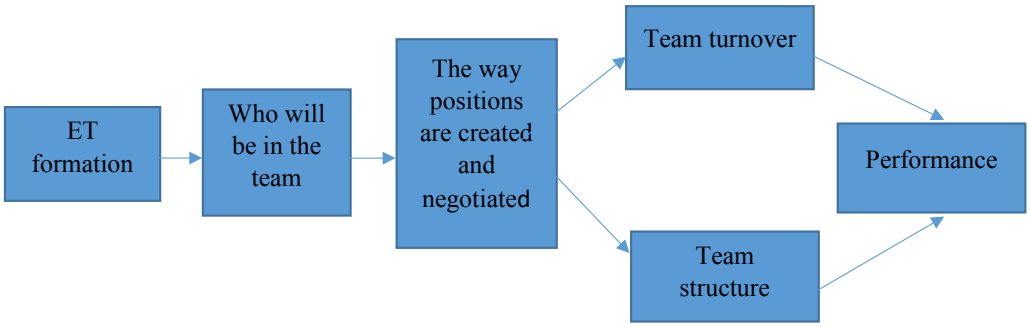

Figure 8. ET formation as an antecedent for team composition and positions created in new ventures

Considering how an entrepreneurial team is formed as an antecedent for position creation in new organizations (as sketched in Figure 8) may lead to an interesting line of inquiry in the position imprinting literature. For instance, the rational model of entrepreneurial team formation suggests that ETs are formed when the lead entrepreneur(s) identifies a competence or skill that is missing in the team (Aldrich & Kim, 2007; Ben-Hafaiedh, 2010; Smith, 2007). This implies that if a team is formed in line with this logic, the position will be created before the holder joins the team. If the team formation follows socio-psychological logic, or homophily (Aldrich & Kim, 2007; Ruef et al., 2003), on the other hand, interpersonal relationships and the desire of existing members to duplicate their own qualities or preserve the existing ambience in the team determines who will join the team. If this is the case, it is more likely that the individuals will join the team first and the positions will be created afterwards. As argued by Jung et al. (2017), however, the process of assigning or creating positions will become problematic when individuals in the founding team have similar backgrounds and qualities. Similarly, if institutional factors dominate the team formation process, as the institutional view (Forbes et al., 2006) would predict, positions would be created and filled to satisfy some expectations set by the external environment to gain legitimacy (Burton & Beckman, 2007; Jung et al., 2017). Future research may test these relationships and link the literature on ET formation with the literature on position imprinting.

Thirdly, the findings of this study contribute to the imprinting literature by suggesting the way ETs form may have an effect on the future career development and choice of team members. Imprinting research at the individual level suggests that "conditions experienced in the early years of organizational tenure or a career exert a lasting influence on subsequent habits, routines, and behaviors" (Tilcsik, 2014, p.641). For instance, some of our informants had no plan to start a company or to work as an executive in a new venture. However, they

wanted to continue in that career path after they were convinced to join the ventures they helped to create. Some others, on the other hand, found that their interest lay in creating something new (not being an executive in an established company). Subsequently, they decided to leave the ventures they helped to create after a certain stage and started new ventures from scratch again, thus becoming serial entrepreneurs.

Although we did not investigate why some members wanted to continue in the executive position and others wanted to go back and start new ventures again, the way the teams were formed at the start and their composition seem to play a role in shaping the career choices of the individual members. For instance, one of our informants stated that the position she had at the time of venture founding made her a central figure in the venture, which enabled her to learn more about how to run a company, and she eventually decided to continue as an executive. In a recent study about imprinting on individual entrepreneurs, Mathias et al. (2015) found that individual entrepreneurs get their imprints from external conditions. The findings of the present study extend this view by suggesting that how an entrepreneurial team forms may have its own imprint on the individual members by shaping their career choice in the future. Future research may test this proposition with a larger sample size. Understanding which types of formation may lead members to stay in entrepreneurship after the life of their team ends is an interesting line of research to understand the imprinting process on individual entrepreneurs.

All in all, I concur with Johnson (2007), who suggested that more attention should be given to the sequence of activities in the venture-founding process to understand the organizational imprinting process better. In doing so, the intersection between the entrepreneur and the environment in building new organizations needs to be assessed (Johnson, 2007). For this, I contend, studying how entrepreneurial teams engaged in organizational founding are imprinted by the environment is the first step. This study contributes to the imprinting literature by suggesting ET formation as an antecedent of the venture-founding process, which the imprinting literature largely assumes as the starting point for organizational imprinting (Mathias et al., 2015).

7.3 Policy and practical implications

From a policy perspective, the findings of this study remind policymakers that policy initiatives aimed at stimulating academic entrepreneurship may need to distinguish different types of entrepreneurial activity in research institutes and universities such as new venture creation and collaboration with industry. If the aim is to create more spinoffs to commercialize academic

research, further emphasis and support may need to be given to researchers who are in the early stage of their academic career. This is because, as our findings suggest, researchers in the early stage of their academic career seem to be more likely to join the entrepreneurial teams in academic spinoffs full-time. Consequently, to trigger academic entrepreneurship through spinoffs, the right incentives may need to be in place to motivate young researchers to go out from their research labs and test their ideas. For instance, policy initiatives may consider including entrepreneurship as a merit in academia, in addition to publication merits, to encourage young researchers who would like to pursue a career in entrepreneurship but are afraid of losing a career path in academia because of that. As some of our informants suggested, the current system does not encourage or even allow them to go back and continue their career in academia if they decided to start their own venture and failed in the process. Therefore, potentially useful and interesting entrepreneurial ventures might not get a chance to be tested. This is in line with Sandström et al. (2016), who suggested that initiatives in academic entrepreneurship need to be able to activate entrepreneurial behaviour among the intended target groups.

Our findings also suggest that policymakers take into consideration the effect of new policy initiatives on the formation of entrepreneurial teams in academic spinoffs when designing new policies. This is because entrepreneurial teams are one of the important resources that may affect the performance of the spinoff (Diànez-Gonzàlez & Camelo-Ordaz, 2016; Huynh et al., 2017). This study provides evidence, from the perspective of entrepreneurial members engaged in creating and developing new academic spinoffs, of how changes in policy and legislation affect entrepreneurial team formation.

For practitioners, our findings remind entrepreneurial team members that their decision to involve different actors throughout the venture development may have implications for the way their team evolves and develops, which in turn influences the future of their venture. Hence, ET members may need to discuss the role of new actors joining them, deciding whom and how to add additional team members. This may help to reduce possible future conflicts between ET members and actors involved throughout the team and venture formation process.

7.4 Limitations and further research

This study has its own limitations. Firstly, the empirical papers focus on the formation aspects of entrepreneurial teams. Hence, the study does not address how the formation aspects of entrepreneurial teams may affect the dynamics of the teams and eventually the performance of

the ventures created by the teams. Future work needs to be done to establish whether there is a relationship between the type of entrepreneurial team formation and team dynamics variables such as conflict (both cognitive and affective), turnover and cohesion. Furthermore, the relationship between entrepreneurial team formation types and entrepreneurial team performance is an interesting research avenue. Future research in this line may build on, for example, Weisz et al. (2004), who found that teams have a higher probability of failure when team formation is motivated by proximity and affectivity instead of rationality.

Secondly, all of the empirical cases considered in this study were drawn from one region in Norway. Thus, additional research in other contexts needs to be done to validate the conclusions and theorizing from our findings in other contexts. For instance, our findings demonstrate that entrepreneurial teams in academic spinoffs may follow a different way of forming as legislations change and technology transfer activities at the parent institute are organized differently. A comparative study across different regional, national and temporal contexts would help to establish whether entrepreneurial team formation indeed varies because of these types of change.

Thirdly, all the cases in this study are from the life sciences sector. Although the cases were chosen for theoretical reasons (Eisenhardt, 1989) and the sector is said to be representative of science-based industries (Owen-Smith & Powell, 2004), future research is needed to validate whether the findings of this study hold in other science-based sectors. Moreover, as all of our cases are teams trying to commercialize research generated from an academic setting, the findings of the study might not necessarily be generalized to all ETs formed outside the academic setting. As argued by Colombo and Piva (2012), ventures created by academics might differ from other technology firms. However, considering the rising interest in new platforms in business and social entrepreneurship, such as co-working spaces (Bouncken et al., 2018), incubators (Mosey et al., 2017) and accelerators (Cohen & Hochberg, 2014) aimed at triggering co-creation and collaboration among entrepreneurs and small businesses, some of the insights from this study could be relevant and used as a springboard for further research in those settings.

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Appendices

Appendix 1 – Guideline for interviews with ET members

Introducing ourselves and our research project …

Background information

- Could you tell us about your background and experience before you co-found ……?
- Was this your first ever attempt to establish an independent venture?
  - ✓ If no, what were the other ventures that you have created or supported?

The business idea and the formation of the ET

- Could you tell us about how the idea behind the venture was originated and developed?
- What about the founding team?
  - ✓ How did you meet each other for the first time?
  - ✓ When did you start discussing about forming a venture together?
  - ✓ What were the most important events during the early stages of the venture founding process?
  - ✓ Did you write any business plan?
    - If yes, what was the main goal you had in mind while preparing it?
    - If no, why?
  - ✓ Did you incorporate or sign a partnership agreement with the co-founder(s)? When?
- Was there any other possible alternative than establishing a new venture to develop the "business idea" further?
  - ✓ If yes, why did you decide to establish an independent venture?
  - ✓ Who was involved financially at the beginning and/or throughout the process?
  - ✓ How did you get in touch with those financers?
  - ✓ Which external stakeholders helped you in developing the idea and the venture further?
- What were you looking for once you decided to launch this venture?
  - ✓ Cash, legal/financial assistance, scientific/technical assistance, managerial assistance, other
- Are (were) there actors who are not part of the founding team that played or playing important role in the development of the venture? How?

Goal, vision and identity

- When you started the venture, what was the main aim or aspiration you had in your mind?
  - ✓ As an individual and/or as a team?
  - ✓ Was there any change in the aim during the process?
- Was the vision or goal set by both the founders the same from the beginning to the end?

- ✓ If there was a difference what was it and how did you solve it?

Development of the team/idea/business

- Are there individuals who helped in the development of the idea or the venture but eventually not part of the founding team?
- What criteria do you use in selecting team members at the beginning?
- Were there resources that you think were important to start the venture but you did not have access to?
  - ✓ If yes, did you manage to secure them through another means? If yes, how?
- While deciding to work with the co-founder(s) were there any criteria that were particularly important to you?

Team members' entry and exit

- How many of the founding team members are still in the venture? If some of them have left, what was the reason? If you add some since then, why?
- Were the criteria used in selecting additional members different from the one that you used at the beginning to create the team?
- Who made the decision regarding addition and reduction of team members through time?

Mode of operation for the team

- How often do you meet (the team members)?
  - ✓ Is the trend the same since the first day up to now?
  - ✓ If there are changes what are they and why (how) was that happening?
- Are all members of the team living in Oslo? Norway? EU?
  - ✓ If some of the members are not living in Oslo or Norway have you ever considered substituting them with someone in Norway? Why?
- How do you think is that affecting the day-to-day activities of the team?

Ownership

- Equity share distribution – was it discussed and agreed from the very beginning or was it something that has been dealt with at the later stage?
  - ✓ If later, at which stage do you discussed that?
- What was the basis for the equity distribution between the founding team members?
  - ✓ If the equity distribution was not equal what was the basis for doing so?
- Who owns most of the shares, and why? (including the change through time, if there is any)

Roles

- Was there a division of labor or responsibility between you and the other co-founder(s) from the very beginning?
  - ✓ If yes, what was that and how was it assigned?
  - ✓ Did the responsibility change over time? If yes, how and why?

Process of problems and solutions

- Is there any principle or value that you think was an important pillar during the establishment of the venture and that has been there all the time throughout the venture? Or changed over time?
    - ✓ If changed why and how?
- Are (were) there topics/issues that you think twice before you share it to the co-founder(s) and the rest of the team?
    - ✓ Why was that?
- Was there a situation where the team had disagreements about the way the venture operates?
    - ✓ If yes, what was the cause and how did you solve it?

Link with previous job

- Could you tell us about the role of your previous job in the development of the idea and the formation of the new venture?
- Were (are) you working full time for the venture?
    - ✓ If yes, since when and for how long?
    - ✓ If no, why didn't you want to work full time there?
- What were the factors that influence you to start the venture together with the co-founder(s) instead of doing it alone?

Source of financing and team stability

- Where is the major source of financing for your venture?
- Is it the same since its establishment?
    - ✓ If yes, have you ever tried to get or consider to get a different source of financing, and why?
    - ✓ If no, what has changed in the venture since the coming of the "different source of finance(r)?

The future

- Do you have a plan to establish another venture?
    - ✓ If yes, will you do it with others or alone? Why?
- If you get a chance to go back and do it again, is there anything that you would have done differently?

Challenges and prospects

- What do you think is the biggest challenge for teams (or ventures) working in the life sciences sector in Norway? What has been improved since the establishment of your venture?
- Do you think that the team is successful so far? If so, how do you define success as a team? What do you think is the critical factor for success for teams working in the life sciences industry?
- If you get a second chance to create the team again, what would have been changed?

Appendix 2 - Guideline for interviews with former and current CEOs of Technology Transfer Offices

Introducing our research project and objectives …

Background

- Background information
  - ✓ Can you tell us about your background?

Characteristics of ventures in the technology transfer office

- How do you classify ventures included under [TTOX's] portfolio?
  - ✓ stage of development
  - ✓ specific technology they are using, or
  - ✓ role played by the TTO in the founding of the ventures
- What characterizes young ventures where [TTOx] was involved? What are typical ones and tell us about the deviants?

Identifying opportunities

- How do you identify opportunities for commercialization? For example, was it the employees who should always approach [TTOx] or vice versa? Was there any difference on this regard between patented and non-patented ideas?
- In which activities is/was [TTOx] involved?
- How is/was the intellectual property right divided between [TTOx] and the inventor(s)?
- If an inventor has a position in different public institutes, how is/was the ownership and involvement of different actors regulated?

Resource endowment:

- What was/is the main source funding for [TTOx]?
- How do you allocate resources? Do you give special preference for teams or individual founders?
- How was the TTO's involvement in identifying, selecting and recruiting individuals to develop the technology further?
- Was/Is there a change in the way [TTOx] operates since its establishment? If yes, how and why?
- Licensing Vs Spin-off – how do you make the decision to license or create a spin-off, if [TTOx] has any power to do so?

About teams in the spin-offs

- Could you tell us, approximately, how many of the ventures in the TTO's portfolio are/were founded by more than one person?
- Could you tell us some examples of ventures in life sciences that have more than one founder? Both successful and may be relatively not?
  - ✓ How was the venture founding process in those ventures?

- How was/is the movement of people from [TTOx] to the ventures (both permanently and temporarily)?
- Is there a pattern that you have noticed regarding the role of teams in the establishment of new ventures where [TTOx] is involved?

Challenges and opportunities

- What do you think is the most important factor for newly formed (or to be formed) ventures in life science to succeed? And why?
- What do you think is the biggest challenge for teams (or ventures) working in the life science sector in Norway in general, and in the area where [TTOx] was/is involved in particular?

Suggestions for cases

- Have you ever worked with team(s) who wanted to establish a venture at any time of your career? If yes, what do you think is special about those teams?
- Could you suggest us ventures in your portfolio that are/were founded by ETs?

Appendix 3 – Summary of secondary data type and sources

The following tables show some of the secondary material collected about each case. This list, however, does not include the data obtained from the website of the ventures which we visited regularly from 2013 to 2017. The data we obtained from the business registry database www.proff.no is also not included in the tables.

Table 1. Data from the ventures created by the teams

Team (Venture)	Type of data	Number of documents	Total number of pages
Gamma	Patent lists	1	7
	Media coverage	4	14
	Total	***5***	***21***
Delta	LinkedIn	5	17
	Company presentations	4	44
	Media coverage/press release	9	32
	Total	***18***	***93***
Epsilon	Annual reports	3	108
	Prospectus	3	333
	Minutes and notices from annual meetings	3	36
	Linkedin account of individuals involved	4	21
	Presentations by the company	20	348
	Press release	5	10
	Patent list	1	7
	Media/other websites coverage	5	5
	Total	***44***	***868***
Zeta	LinkedIn	8	28
	Media Coverage	2	4
	Total	***10***	***32***
Eta	LinkedIn accounts	9	27
	Media coverage/press release	7	17
	Total	***16***	***44***
Theta	LinkedIn	7	31
	Presentations by the company	7	187
	Media coverage	4	11
	Minutes and notices from annual meetings	2	15
	Total	***18***	***244***

Table 2. Secondary data obtained from TTOs and other sources

TTO/or other source	Type of data	Number of documents	Total number of pages
TTO3	Presentations	3	86
	Media coverage	4	14
	Total	***5***	***100***
TTO1	Annual reports	2	30
	Total	***2***	***30***
TTO4	Presentation	2	66
	Annual report	1	8
	Media report	1	1
	Total	***4***	***75***
Authorities	Letters/decisions	3	16
	Total	***3***	***16***
External reports about the life science sector Norway	Innovation Norway report (evaluation)	1	40
	Other documents and research reports	7	498
	Total	***8***	***538***
Total		***22***	***759***

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