

# The role of the top management team and board in academic spin-offs





# HØGSKOLEN I SØR-TRØNDELAG

Avdeling for teknologi

## RAPPORT

Tittel: The role of the top management team and board in academic spin-offs

Forfatter: Ekaterina S. Bjørnåli

Høgskolen i Sør-Trøndelag, Avdeling for teknologi, Program for allmennfag, 7004 Trondheim

Oppdragsgiver/finansieringskilder: Norges Forskningsråd

Rapportnummer  
01-2010

ISSN  
1891-571X

ISBN  
798-82-7877-200-3

### Sammendrag

Denne rapporten utforsker hvilken rolle ledelse og styre spiller i utviklingen av akademiske spin-off bedrifter. Rapporten prøver å besvare følgende spørsmål: Hva kjennetegner lederteamet og styret i suksessrike spin-off bedrifter og hva kan vi lære av dette? Hvordan offentlige program rettet mot å fremme spin-off etableringer kan utformes mht det å ha en riktig human kapital som bidrar til vekst i bedrifter? Funnene viser at i suksessfulle akademiske spin-off bedrifter tilfører nøkkelpersoner i styret ressurser som lederteamet mangler. Styrets størrelse og nettverksbygging fremgår som viktige faktorer når det gjelder det å rekruttere nye medlemmer til lederteamet med nødvendig kompetanse som åpner opp for nye vekstmuligheter. Akademiske spin-off bedrifter som har bidragsytende styre og lederteammedlemmer med variert funksjonell og industriell bakgrunn lykkes med å rekruttere nye teammedlemmer og anskaffe venture kapital. Blant våre anbefalinger for aktører og program som støtter akademiske spin-off bedrifter er å imøtekomme disse bedriftenes behov for å finne profesjonelle eksterne styremedlemmer.

Antall sider  
34

Status  
Åpen

Sted og dato  
Trondheim, 02.03.2010

## Preface

This report attempts to ascertain the significance of the top management team and board of directors in the development of academic spin-offs. The report is based on the results of my doctoral dissertation and additional analyses of survey data. The survey was conducted in autumn 2008; 135 academic spin-off companies returned their questionnaires resulting in a response rate of 45 %.

I am grateful to the FORNY programme that made it possible to carry out the survey-based part of my research. I wish to thank my former supervisor Truls Erikson at University of Oslo and Einar Rasmussen at Bodø Graduate School of Business, who have provided academic advice and comments on this report. I am also grateful to my colleagues Olav Spilling and Magnus Gulbrandsen at NIFU STEP Norwegian Institute for Studies in Innovation, Research and Education, for their insights, comments and professional support.

Ekaterina S. Bjørnåli

Trondheim, March, 2010

# Contents

|   |     |
|---|-----|
| <b>Summary</b> .....  | vi  |
| <b>Sammendrag</b> .....   | vii |
| <b>1 Introduction</b> .....   | 1   |
| <b>2 Theoretical framework</b> .....  | 2   |
| 2.1 Academic spin-off development .....   | 2   |
| 2.2 The top management team and board of directors .....  | 3   |
| <b>3 Methods and data collection</b> .....  | 4   |
| 3.1 Preliminary interviews and case studies .....   | 4   |
| 3.2 Survey .....  | 5   |
| 3.3 Summary of the data and methods .....   | 6   |
| 3.4 Measuring the success of spin-off firms .....   | 7   |
| <b>4 Descriptive statistics</b> .....   | 8   |
| 4.1 Respondent firms' characteristics .....   | 8   |
| 4.2 Characteristics of the management team and board .....  | 11  |
| <b>5 Distinctive team and board characteristics associated with successful academic spin-offs</b> ..... | 13  |
| 5.1 Firm performance and team characteristics .....   | 13  |
| 5.2 Firm performance and board characteristics .....  | 14  |
| 5.3 Board's value-adding role .....   | 14  |
| 5.4 Networking and active boards .....  | 14  |
| 5.5 Board, team and financing .....   | 15  |
| 5.6 Team and board membership changes .....   | 16  |
| <b>6 Implications</b> .....   | 17  |
| <b>7 Conclusions</b> .....  | 19  |
| <b>Literature</b> .....   | 20  |
| <b>Appendix</b> .....   | 22  |

## List of tables and figures

|   |    |
|---|----|
| Figure 2.1 Academic spin-off development: stages .....  | 3  |
| Figure 2.2 Top management team (TMT), board and academic spin-off development .....   | 4  |
| Table 3.1 Means, standard deviations and tests for differences in means between the responding firms and those not responding to the survey ..... | 6  |
| Table 3.2 Summary of methods used in the dissertation studies .....   | 7  |
| Table 4.1 Firm life cycle stages .....  | 8  |
| Table 4.2 Innovation degree and scope .....   | 8  |
| Figure 4.1 Industry of the firms distributed across the various stages .....  | 9  |
| Table 4.3 Parent organization.....  | 10 |
| Figure 4.2 Industry of the spin-offs from NTNU and SINTEF compared to other spin-offs ..  | 10 |
| Table 4.4 Have the firm contacted and ever received external financing from the following actors?.....  | 11 |
| Table 4.5 Number of academics on the team .....   | 12 |
| Table 4.6 Full-time equivalents of employed academics .....   | 12 |
| Table 4.7 The number and nature of team membership changes .....  | 12 |
| Table 1 Cases overview.....   | 22 |

## Summary

This report addresses the under-studied area of the role of the top management team and board of directors in the development of academic spin-off companies originating from universities and public research institutes.

The questions addressed are as follows:

- What are the distinctive team and board characteristics associated with successful academic spin-offs and what we can learn from this? (Section 5).
- How can public government programs that aim to stimulate academic spin-off formation be designed, in order to take into account the important aspects of human capital in these firms? (Section 6).

The findings show that boards in successful academic spin-off firms add value by bringing in necessary resources that the management team lacks. Additions of outside directors to the board are associated with a positive firm development. Larger and more active networking boards facilitate the recruitment of new people to the top management team. The board chair's personal networks are important when finding new potential board members. Effective teams have members with diverse functional experience and industrial backgrounds. This diversity is associated with the firm's ability to recruit new members to the management team and attract venture capital financing. The probability of attracting venture capital financing is also higher when an academic spin-off has previously received seed and industry capital financing.

We recommend that policy makers develop policies that support the needs of academic spin-off firms to find professional outside directors. We also recommend that seed funds could make more investments in academic spin-offs and that more industrial schemes could be designed to stimulate greater involvement of industrial actors in academic spin-offs.

## Sammendrag

Denne rapporten utforsker hvilken rolle ledelse og styre spiller i utviklingen av akademiske spin-off bedrifter.

Rapporten prøver å besvare følgende spørsmål:

- Hva kjennetegner lederteamet og styret i suksessrike spin-off bedrifter og hva vi kan lære av dette (kapittel 5);
- Hvordan offentlige program rettet mot å fremme spin-off etableringer kan utformes mht det å ha en riktig human kapital som bidrar til vekst i bedrifter (kapittel 6).

Funnene viser at i suksessfulle akademiske spin-off bedrifter tilfører nøkkelpersoner i styret ressurser som lederteamet mangler og som varierer fra finansiell og industriell erfaring i tidligere faser til ledelses og markedsføring / salgs erfaring i senere utviklingsfaser. Slik hjelper eksterne styremedlemmer bedriften til å styrke sin levedyktighet og nærme seg da neste fase hvor avkastningen gjerne stabiliserer seg. Styrets størrelse og nettverksbygging fremgår som viktige faktorer når det gjelder det å rekruttere nye medlemmer til lederteamet med nødvendig kompetanse som åpner opp for nye vekstmuligheter. Akademiske spin-off bedrifter som har bidragsytende styre og lederteammedlemmer med variert funksjonell og industriell bakgrunn lykkes med å rekruttere nye teammedlemmer og anskaffe venture kapital. Samtidig øker sannsynligheten for å skaffe venture kapital hvis spin-off bedriften tidligere har lyktes med å skaffe finansiell støtte fra såkornfond og industrielle partnere.

Våre anbefalinger for aktører og program som støtter akademiske spin-off bedrifter er å imøtekomme disse bedriftenes behov for å finne profesjonelle eksterne styremedlemmer. Vi anbefaler også at såkornfond går inn i flere akademiske spin-off bedrifter og flere industrielle program kunne vært utviklet for å stimulere at industrielle aktører engasjerer seg i akademiske spin-off bedrifter i større grad.

# 1 Introduction

This report relates to the development of academic spin-off firms. Academic spin-offs are technology-based firms founded by employees from a university or research institute, around a technology which has initially been developed at the university or research institute (Birley 2002). Studies on the creation of new firms from universities comprise a rapidly growing research area (Shane 2004; Wright et al. 2007). This rising research interest reflects the increases in commercial activity and spin-off formation taking place in the majority of universities (Lockett et al. 2005). Governments increasingly recognise that academic spin-offs are important generators of national growth and societal development (O'Shea et al. 2004; Wright et al. 2004; Lindholm-Dahlstrand and Klofsten 2002) and therefore direct more support to stimulate the process of technological transfer with the aim of spawning more high-growth, technology-based firms from university research.

In 2003, Norway made a legislative change, which is similar to the 1980 Bayh-Dole Act in the US, implying that researchers no longer hold intellectual property rights to their inventions (Rasmussen et al. 2006a). Since this change, the universities own these rights and following from this, technology transfer offices (TTO) have been established in order to commercialize and manage these rights. There are several programs and actors that support Norwegian start-ups which try to commercialize research-based business ideas (Rasmussen et al. 2007; Borlaug et al. 2009). For instance, the FORNY program (which works indirectly through TTOs) deals with pre-startup academic spin-offs during the research and opportunity framing stages. The program has funds for idea generation, commercialization, proof of concept, and leave of absence allowing academics to work on ideas and test their concepts on a full-time basis. Government agency Innovation Norway lends financial and managerial support to the founders of the ventures with growth potential, including academic spin-offs, which have been legally established. In later post-startup stages, when the technology is verified and the venture has proved its viability, a spin-off may apply for a public and industrial R&D contract grant ("IFU/OFU"). By having this scheme, Innovation Norway stimulates spin-off companies to cooperate with the public sector (e.g. hospitals, the Norwegian Armed Forces) and industry.

As with studies in other countries, most spin-off studies in Norway primarily investigated government and university initiatives to promote and support commercialization of academic research (e.g. Rasmussen et al. 2006b; Rasmussen and Sørheim 2006). Few studies examine the founding team demonstrating that it evolves in to a top management team and board during legal incorporation and that the team heterogeneity has significant consequences for firm performance (Ensley and Hmieleski 2005; Vanaelst et al. 2006). Academic spin-off ventures are typically founded by entrepreneurial teams (Roberts 1991; Shane 2004). Such teams can play a significant role in facilitating business development and superior business performance, when compared to spin offs started by individuals (Roure and Maidique, 1986; Kamm et al., 1990) because a venture led by a team will generally be broader and more diverse in terms of human capital, than a venture led by a solo entrepreneur. Even fewer studies investigate the role of boards in academic spin-offs (e.g. Clarysse et al. 2007). This is surprising as well-networked outside directors may contribute to spin-off development, by increasing a firm's legitimacy and thus reducing liabilities of newness as well as providing access to critical external resources that young academic spin-offs need to survive (Pfeffer and Salancik 1978; Selznick 1949; Lynall et al. 2003).



This report sheds light on the role of the top management team and board in academic spin-off development. The questions addressed are as follows:

- What are the distinctive team and board characteristics associated with successful academic spin-offs and what can we learn from this?
- How can public government programs that aim to stimulate academic spin-off formation be designed, in order to take into account the important aspects of human capital in these firms?

In this report I draw heavily on the materials and results from my dissertation (Bjørnåli 2009) and published articles which are included in this dissertation. However, this report brings additional insights regarding the roles of teams and boards role in spin-off ventures. Additional descriptive statistics on Norwegian academic spin-offs are presented (in section 4), supplemental correlation analysis has been conducted, and the questions listed above are addressed.

The structure of the report is as follows: the theoretical framework and the main concepts used are presented in section 2. Section 3 describes methods and data collection including the preliminary qualitative studies, the survey, and key measures. The characteristics of the respondent-firms and their teams and boards are described in section 4. Chapters 5 and 6 address this report's two key questions in turn; and, finally conclusions are set out.

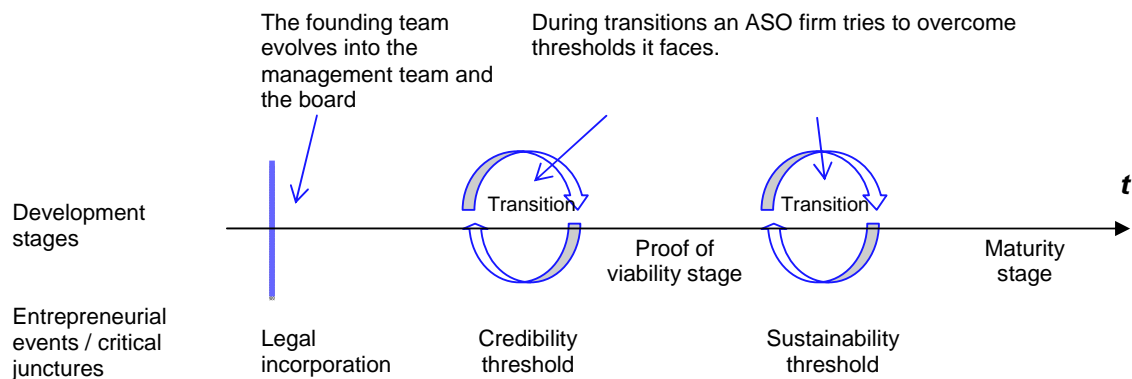
## 2 Theoretical framework

### **2.1 Academic spin-off development**

Drawing on stage-based and life-cycle literature, an academic spin-off is seen as a threshold firm undergoing transitions and moving from one development stage to the next (Kazanjian 1988; Vohora et al. 2004). To progress to the subsequent stage a spin-off venture has to overcome the thresholds it faces. This process is characterized as iterative and non-linear with setbacks and steps forward. Therefore, the successful spin-off development is, rather than by sales and profit, defined by whether the venture has overcome certain thresholds and achieved important entrepreneurial milestones. For instance, attracting external finance, e.g. venture capital, is a key constraint on the development of academic spin-off firms (Wright et al. 2006). Thus, having achieved venture capital financing may be seen as an important entrepreneurial milestone marking a spin-off's success.

The academic spin-off development process is illustrated in Fig.2.1. One of the most important entrepreneurial events is the legal establishment of the company (see Fig. 2.1). According to Vohora et al. (2004), after legal incorporation an academic spin-off needs to overcome two main critical thresholds if it is to succeed: credibility and sustainability. The credibility threshold is a lack of credibility that constraints the academic entrepreneur's ability to access and acquire seed finance and human capital to develop the entrepreneurial team (ibid). By overcoming the credibility threshold the venture reaches a Proof-of-Viability stage characterized by proving the viability of the venture, having a team and necessary initial resources to develop business. The ability to continuously re-configure existing resources, capabilities and social capital with new information, knowledge and resources is required to overcome the threshold of sustainability (ibid). Having overcome the sustainability threshold means reaching the last, sustainable returns or Maturity stage, in which the company's

credibility outside the scientific community is increased and sufficient returns from business activities are achieved.

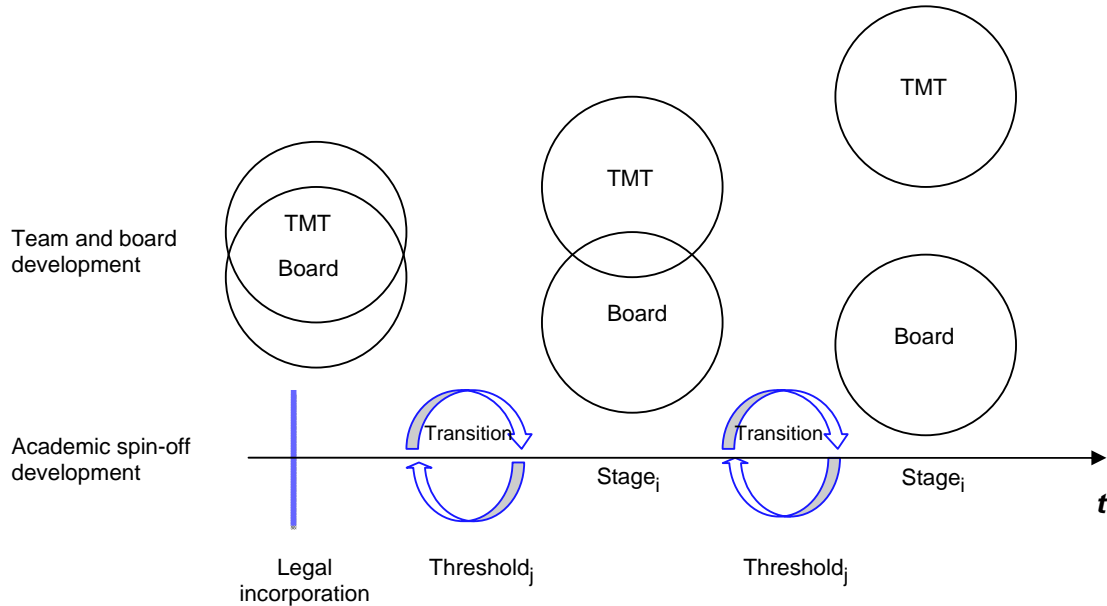


**Figure 2.1 Academic spin-off development: stages**

## **2.2 The top management team and board of directors**

A top management team is defined as a group of people who are responsible for managing an academic spin-off and making key strategic decisions related to spin-off development. Similar to academic spin-off development, an academic spin-off team is also a dynamic concept. Recent studies that build on stage-based models demonstrate that during legal incorporation of the firm the top management and board of directors are formed (Vanaelst et al. 2006; Filatotchev et al. 2006). The founding team that has led an ASO through the research stage splits into the top management team and board during the legal establishment of the firm. The founding team members become members of the management team, board or both. For instance, academic founders and surrogate entrepreneurs introduced from outside academia (Franklin et al. 2001) may become part of both the TMT and board (Vanaelst et al. 2006). Other people who help academic founders in the pre-startup stage, such as TTO officers, become board members (Vanaelst et al. 2006; Filatotchev et al. 2006). Thus, the management team and board of directors can overlap (see Fig. 2.2). Figure 2.2. illustrates the process of team and board formation and development.

A concept of academic spin-off development adds to the complexity of team and board concepts. As a spin-off develops and reaches growth and maturity, the changes in management and governance structure occur (Vohora et al. 2004; Vanaelst et al. 2006; Filatotchev et al. 2006). That is new members may be introduced to the team and/or board. Some members may shift their positions from being a top manager to becoming a board member or leave the organization. This implies that as the firm develops the management team and board may become less overlapped and even completely separated as depicted in Fig. 2.2.



**Figure 2.2 Top management team (TMT), board and academic spin-off development**

Thus, the board in academic spin-offs is shown to be an important component of the management of academic spin-offs. Along with the top management team, the board represents a crucial factor, which may affect academic spin-off development by influencing firms' strategic decisions and future directions. Due to the overlap of the team and board and an active involvement of outside directors in academic spin-offs, the majority of which are early stage companies, this report focuses on both the top management team and the board of directors.

### 3 Methods and data collection

#### 3.1 Preliminary interviews and case studies

First, I carried out several interviews with the people involved in technology transfer and commercialization processes. These people were from such support organizations as (i) Innovation Norway (local office in Trondheim) which grants incubator and other stipends to entrepreneurial firms, (ii) technology transfer office NTNU TTO established in 2004, one year after Norway had made the Bayh-Dole Act-like legislative change, (iii) commercialization organization Leiv Eriksson Nyskapning which has existed long before NTNU TTO was established and fulfilled similar functions of facilitating commercialization and spin-off activity from research institutes in Trondheim, (iv) TTO Campus Kjeller in Lillestrøm, and (v) the FORNY program, a unit under the Research Council of Norway, which is in charge of stimulating commercialization of research results nationally. I also interviewed a couple of academic founders with long experience of commercializing their research, asking them about the challenges they met during their start-up efforts. Many of the problems emphasized by practitioners were particularly related to the management in academic spin-offs.

Then, I proceeded to the case studies given limited prior research on boards and management teams in academic spin-offs. The cases are described in details in an appendix to this report. It was important to sample firms, which were in different development stages, to better capture the dynamic aspects of board and team development during a firm's life cycle. Occurrence of at least one board/team change (new person added, not merely role change) is a "must" case choice criterion. Another important criterion is the enduring involvement of the scientist-entrepreneur or externally introduced entrepreneur occupying a key position in the firm, e.g. chief executive officer (CEO), chief technology officer or board chair. Such a person who has taken the venture through the founding process and is aware of the current operations of the company is expected to provide more detailed and relatively accurate descriptions related to board/team formation and evolution compared to other employees.

In all cases there was a steady growth in the amount of employees in all cases. The cases represent different industries, including biotechnology, semiconductors, ICT, food, and fibre optics. Each of the venture's core technology (or medicine, drug) is characterized as internationally new. All ventures except ICT spin-off have patented their core technology in and outside their country. The case ventures come from five different Norwegian research institutions and three US universities. Academic spin-offs may be seen as fairly common in the US and Norway, but the surrounding networks and support structure (e.g. supply of venture capital) vary widely. Data were collected through in-depth face-to-face interviews conducted late in 2006 in Norway and early in 2007 in the US. In addition, I used several databases that contain accounting data and information on the board and top management. The anonymity for companies and informants was assured.

### **3.2 Survey**

Preliminary interviews and multiple case studies have given some basic insights into the academic spin-off phenomenon. These insights were useful when designing the questionnaire. I have been able to identify 353 companies considered as originated from Norwegian universities and public research institutes. There are 318 companies registered as having used the university TTO or technology licensing-like organizations in the FORNY database. The rest of the companies were found through web searches. Amongst the companies, 53 reported that they were not ASOs or were no longer active. Hence, after drop outs the sample consisted of 300 spin-offs. The questionnaire was sent to the CEOs of these ASOs in autumn 2008. Anonymity for all companies and informants was assured. After two to-three rounds of personal phone calls to the CEOs, 135 academic spin-off companies returned their questionnaires resulting in a response rate of 45 %.

Due to an active involvement of the Research Council of Norway in facilitating the creation of spin-off companies through the FORNY program there have for about fifteen years been attempts to trace and register all academic spin-offs in the database. This population consists of the spin-off companies created since 1995 (or earlier if it was possible to identify) which involves academic researchers, university technology or both, which all fit the definition of an academic spin-off adopted in this study. As less than ten percent of the start-ups that fit the definition were identified through other sources than the FORNY database, I assume that the characteristics of the sample are comparable to those of the whole population of academic spin-off companies in Norway. Hence, the sample in this study is believed to be representative of the entire population of academic spin-offs.

The survival bias is somewhat reduced since the cases represent the whole range of development stages, from the very early stages to maturity and decline stages. The cases in early (research) and decline stages amount to 4.4 % of the sample. Also, non-response bias was tested by comparing two different samples drawn from the same population. The sample of the non-respondents was drawn from the FORNY database. I tested non-response bias using three characteristics. The data was available on the amount of employees, firm age and operating revenues in 2007 for 82 firms that responded and for 137 non-respondents. Mean values and tests for differences in mean values between respondents and non-respondents can be found in the Table 3.1. The responding firms had on average three employees while non-responding firms had four employees. The average age of responding and non-responding firms was approximately the same. Operating revenues are lower in respondent firms. Our sample seems to be somewhat biased towards the smaller firms. However, no statistically significant differences are found, which indicates that non-response bias is not a problem.

**Table 3.1 Means, standard deviations and tests for differences in means between the responding firms and those not responding to the survey**

| <b>Characteristics</b>                      | <b>Respondents</b>            | <b>Non-respondents</b>      | <b>T-statistic</b> |
|---|-------------------------------|-----------------------------|--------------------|
| Sample size                                 | 82                            | 137                         | n/a                |
| Number of employees                         | 3.38<br>(s.d. 5.16)           | 4.31<br>(s.d. 21.36)        | .390               |
| Firm age<br>(in years)                      | 5.71<br>(s.d. 3.23)           | 5.92<br>(s.d. 3.43)         | .448               |
| Operating revenues<br>(in Norwegian Kroner) | 2 939 047<br>(s.d. 4 507 240) | 5 366 294<br>(s.d. 2.740E7) | .795               |

Notes: **s.d.** standard deviation

### **3.3 Summary of the data and methods**

The data sources and methods used in this report are summarized in Table 3.2. The understudied topic of board dynamics in academic spin-offs is addressed by employing a multiple case inductive research design, that provides us with rich empirical and theoretical insights (article 1). The characteristics associated with boards that are active in recruiting new team members in spin-offs are analyzed by using logistic regression (article 2). Firm characteristics associated with successful venture capital acquisitions in spin-offs are tested with hierarchical logistic regression on the financial, team and board levels (article 3). Other results in the report are analysed through descriptive statistics and correlations at the strictest level of significance (.01). This stringent criterion implies that we can say with 99% probability that the (hypothesized) relationship in the population is there.

**Table 3.2 Summary of methods used in the dissertation studies**

| <b>Articles</b>   | <b>Data</b>   | <b>Method</b>                                |
|---|---|--|
| 1. Exploring board formation and evolution of board composition in academic spin-offs (Bjørnåli & Gulbrandsen 2010)             | Case data on 11 academic spin-offs.<br>Secondary data: databases and extensive web searches | Multiple case inductive study                |
| 2. Board features associated with new team member addition in academic spin-offs (Bjørnåli & Erikson 2010)                      | Survey data on 135 academic spin-off companies  | Logistic regression analysis                 |
| 3. Design characteristics associated with venture capital acquisitions in academic spin-offs (Bjørnåli, Sørheim & Erikson 2010) | Survey data on 135 academic spin-off companies  | Hierarchical logistic regression analysis    |
| Other results in this report  | Cases and survey data   | Correlation analysis, descriptive statistics |

### ***3.4 Measuring the success of spin-off firms***

The performance of a firm is often measured by sales revenues and profits for the past three years. Our sample ranges from early start-ups to more mature ASOs. Many of these firms have no sales or profit, so these traditional measures are not appropriate.

In article 1 (Bjørnåli and Gulbrandsen 2010), we measure a firm's success in terms of whether it has overcome the thresholds of credibility and/or sustainability and thus reached the next development stage (see Fig. 2.1). In article 2 (Bjørnåli and Erikson 2010), we use an all-subjective measure on how the company has been developing since its foundation (Fredriksen and Klofsten 1999). More specifically, we measure firm performance based on asking firms to estimate various performance variables and give each a rating of between 1 (much worse) and 7 (much better). These variables include: growth in sales, growth in market share, profitability and financing since the firm's foundation, the quality of the firm's product/service, innovation in the form of new products/services and customer satisfaction since the firm's foundation. We have also asked about the degree to which the firm is satisfied with its market share, profit, sales and return on assets. In article 3 (Bjørnåli et al. 2010), we find that academic spin-offs are facing venture capital constraint; although it is challenging to obtain such funding, risk capital from venture capitalists appears to be an important source of funds for academic spin-offs, and a potential catalyst for these spin offs' growth (Wright et al. 2006). Therefore in article 3 spin-off performance is measured in terms of success in attracting venture capital, or not.

## 4 Descriptive statistics

### 4.1 Respondent firms' characteristics

Firm size, as measured by the number of full time equivalents (FTE), varied across the sampled firms: in 2008 this ranged from 0 to 35. However, for the majority of the firms the FTE range in 2008 was between 0 and 12. The ages of the firms varied from 1 to 24 years. The average firm age is 7.7 years.

As for the life cycle stages, most of the firms were in the development, introduction and growth phase. Few firms ( $n = 10$ ) were in the maturity stage. Even fewer firms reported that they were in a very early stage ( $n = 4$ ) or in a declining/no activity stage ( $n = 4$ ). The early stage was operationalized as following: a stage when the firm evaluates its commercial potential and strengthens its intellectual property rights, applies for patent or tries to protect the technology which will underlie its future product/service. The operationalization of other stages and the distribution of these stages are presented in Table 4.1.

**Table 4.1 Firm life cycle stages**

| <b>Firm life cycle stages</b>  | <b>Frequency</b> |
|--|------------------|
| Early stage: We evaluate the commercial potential and strengthen intellectual rights; we apply for a patent or try to protect technology which will be at the core of our product/service. | 4                |
| Development stage: We are developing a product/service, which to limited degree is introduced in the market. Revenues are very low.  | 38               |
| Establishment / Introduction stage: Our product/service is gradually being introduced in the market.   | 43               |
| Growth stage: firm grows fast and investments may be necessary for further development. Our product/service can be introduced in several markets, and the sales are increasing.            | 35               |
| Maturity stage: The sales are flattening out. Our firm has reached all potential customers in the targeted markets.  | 10               |
| Decline or no activity   | 4                |
| Total  | 134              |

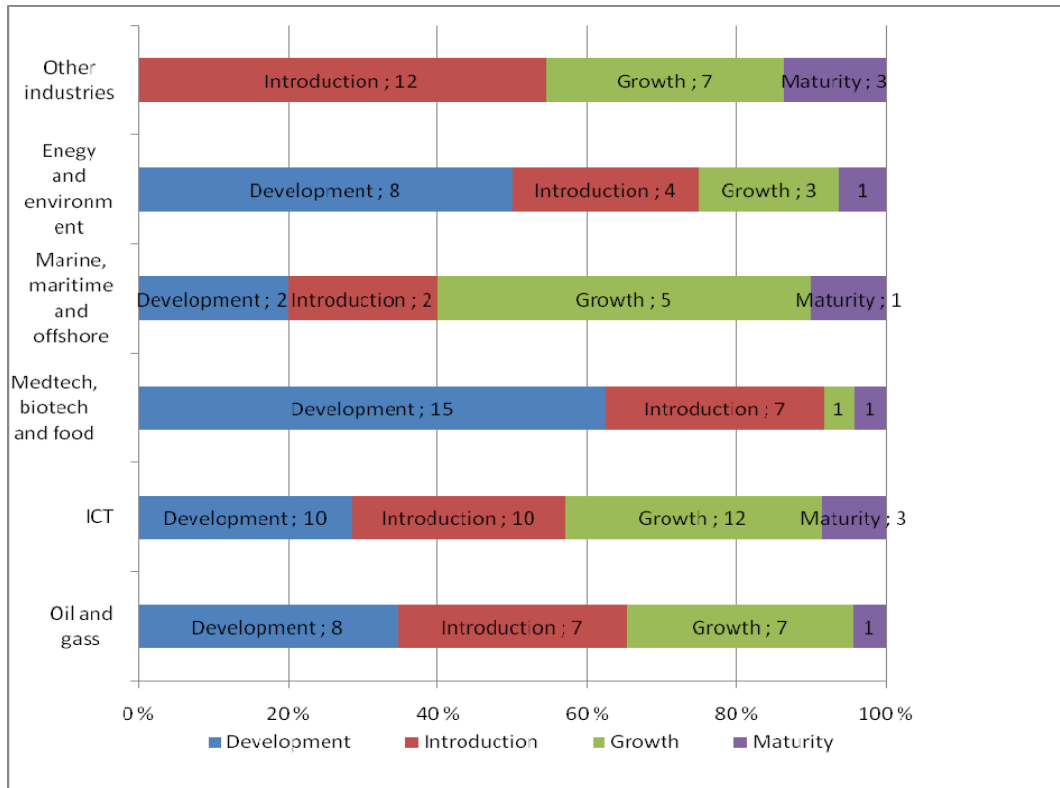
Most of the firms reported that they were highly innovative. That is, most of the firms ( $n = 108$ ) reported that the product/service or technology they were developing or the market they were aiming at was completely new (see Table 4.2). The rest of the firms ( $n = 26$ ) answered that a similar product/service, technology or market exists. Most of the firms has a product/service, technology or market that was also new internationally ( $n = 92$ ). Only 14 firms had a product/service, technology or market that was only new in the firm's country or locally.

**Table 4.2 Innovation degree and scope**

|   | <b>Frequency</b> |
|---|------------------|
| New product/service, technology, or market                | 108              |
| Similar product/service, technology, market exist         | 26               |
| New product (service, technology, market) internationally | 92               |
| New product (service, technology, market) in firm country | 14               |

The firms represent a broad range of industries such as ICT and health, oil and gas, energy and environment, medical and biotechnology and maritime and offshore, amongst others. As we can see from Fig. 4.1, firms in oil and gas and ICT and health industries are more or less

equally distributed across the development, introduction and growth stages. Most of the firms in the biotech-related and energy and environment industries are in the development stage. Most of the firms in maritime and marine-related industries are in the growth stage. Firms in other industries are mostly in the introduction stage. Many firms in other industries are consulting firms, but this group also contains those facilitating R&D and operating in finance, education, automation, industrial and ergonomics design industries.



**Figure 4.1 Industry of the firms distributed across the various stages**

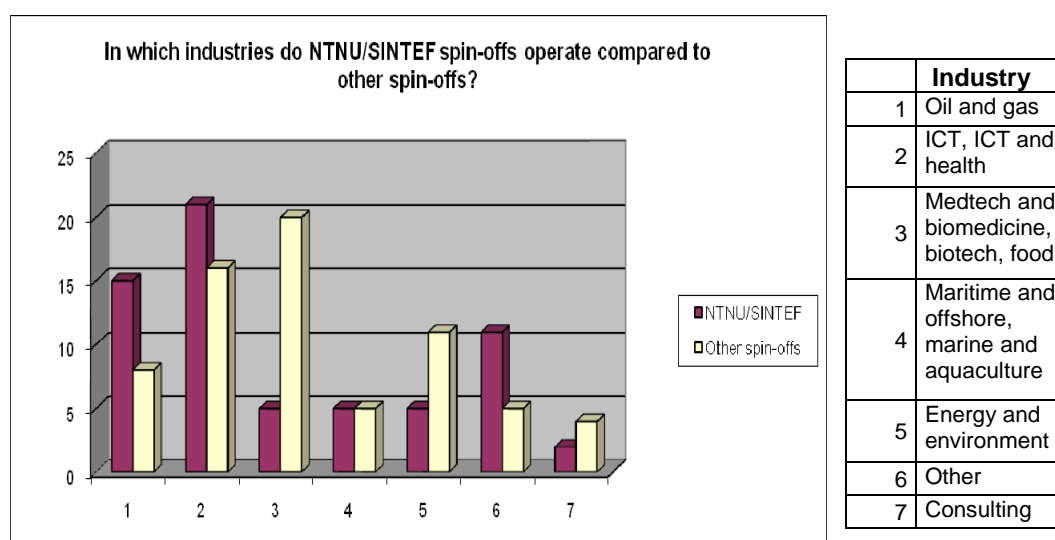
In total, 64 firms report that they originate from NTNU and SINTEF. The rest of the spin-off firms come from other Norwegian universities and public research institutes, as presented in Table 4.3. The history of the commercialization and establishment of technology transfer office at NTNU is thoroughly described in Spilling et al. (2006). More information about other TTOs can be found in Rasmussen et al. (2007) and Borlaug et al. (2009).



**Table 4.3 Parent organization**

| Parent organization                                  | Number of spin-offs |
|--|---------------------|
| NTNU: Norwegian University of science and Technology | 50                  |
| The SINTEF Group                                     | 14                  |
| UiO: University of Oslo                              | 11                  |
| UMB: Norwegian University of Life Sciences           | 10                  |
| University colleges                                  | 8                   |
| UiT: University of Tromsø                            | 8                   |
| Research Institutes and centers                      | 7                   |
| IRIS: International Research Institute of Stavanger  | 5                   |
| FFI: Norwegian Defence Research Establishment        | 4                   |
| UiB: University of Bergen                            | 4                   |
| UiA: University of Agder                             | 3                   |
| IFE: Institute for Energy Technology                 | 3                   |
| UiS: University of Stavanger                         | 1                   |

Most of the NTNU/SINTEF spin-offs operate in oil and gas and ICT-related industries, which may reflect the strong academic quality and spin-off establishment practices in their respective faculties/departments at NTNU and SINTEF (see Fig. 4.2).



**Figure 4.2 Industry of the spin-offs from NTNU and SINTEF compared to other spin-offs**

We asked the firms whether they have been situated in a university incubator or research/science parks; 54 firms (40%) have been situated in university incubators; 27 firms (20%) have been based in research/science parks.

The type of financing for the firms is presented in Table 4.4. About one-fifth of all firms have private financing (from family). Nearly a quarter (24%) of firms have received seed financing, while 14% have tried, but failed, to receive seed financing. Incubator stipends have been

received by 43% of firms. Another 40% of firms were financed through a public or industrial R&D grant (“IFU/OFU”). Many firms (63%) have received a range of other types of financial support. Among other types of support there is “Skattefunn”, a programme for supporting R&D investments and financial support from Innovation Norway, the European Union or customers.

As for external private equity financing, 76 firms were financed by private investors (see Table 4.4). Industrial investors financed 45 spin-offs. Being financed by industrial investors is strongly correlated with R&D grants “IFU/OFU”, demonstrating that these types of financing are closely related to each other. Venture capital has been received by 37 spin-offs.

**Table 4.4 Have the firm contacted and ever received external financing from the following actors?**

|                     | No, has not tried (%) | Has tried, but has not received (%) | Has received financing (%) |      |
|---------------------|-----------------------|-------------------------------------|----------------------------|------|
| Family              | 80                    | 0                                   | 20                         | 100% |
| Seed fund           | 62                    | 14                                  | 24                         | 100% |
| Incubator stipend   | 53                    | 5                                   | 43                         | 100% |
| R&D “IFU/OFU” grant | 52                    | 8                                   | 41                         | 100% |
| Other support       | 34                    | 3                                   | 63                         | 100% |
| Private investors   |                       |                                     | 76 firms (56%)             |      |
| Industrial partners |                       |                                     | 45 firms (33%)             |      |
| Venture capitalists |                       |                                     | 37 firms (27%)             |      |

The firms were also asked to identify their largest owner, as the original founder, an externally hired CEO, a venture capital investor, an industrial partner, a TTO, their employees or other external owners. In 53 spin-offs an external party is the largest owner, the external party being either venture capital investors (in 16 firms), industrial partners (in 10 firms), TTOs (9 firms), or other unspecified external owners (15 firms). The original founder is the principal owner in 43 firms. In 34 of the spin-offs an externally hired CEO is the largest owner.

In cases when investors have financed a spin-off, we asked whether somebody from the spin-off firm had a previous relationship with this investor. In 61 firms (42%) the board chair or external board member had a previous relationship with the investor. In 28% of firms the CEO had a previous relationship with the investor. In 8% of firms team members were the source of that investor relationship and only in 2 % of firms (3 spin-offs) had previous relationship an investor through TTOs.

## **4.2 Characteristics of the management team and board**

Management team size varies from 0 to 9 persons, with an average team size of 2.62 team members. Board size varies from 1 to 7 with an average board size of 3.80 board members.

In terms of the composition of the board, 42 firms (32%) do not have any academics (professors, researchers, PhD students) on their teams (see Table 4.5), while 37 firms (or 28%) have just one academic. The rest of the companies have two or more academics on their top management teams. Twenty firms reported that they have students on the team who are taking, or have taken, a master degree. Eight firms involve TTO representatives in the team.

**Table 4.5 Number of academics on the team**

| Number of academics on the team | Frequency | %   |
|---------------------------------|-----------|-----|
| 0                               | 42        | 32  |
| 1                               | 37        | 28  |
| 2                               | 23        | 17  |
| 3                               | 17        | 13  |
| 4                               | 8         | 6   |
| 5 - 8                           | 5         | 4   |
|                                 | 132       | 100 |

The distribution of FTEs spent on the spin-offs by academics is shown in Table 4.6. In 23 firms academics account for less than one FTE. In the rest of the firms one or more FTEs are accounted for by academics.

**Table 4.6 Full-time equivalents of employed academics**

| FTE   | Frequency | %   |
|-------|-----------|-----|
| < 1   | 23        | 27  |
| 1     | 25        | 30  |
| 2     | 16        | 19  |
| 3     | 12        | 14  |
| 4 - 8 | 9         | 11  |
|       | 85        | 100 |

In 62 firms the original founder is the CEO. In 12 firms the original founder is a board chair. In eight firms the original founder is a R&D director. In other firms the original founder has an additional role of some sort, such as board member, technical director or consultant. In 63 firms the board chair represents the main owner in the firm. In 26 firms the board chair is also the CEO of the firm.

We have registered 75 membership changes in the management team and/or board (see Table 4.7). Of these, 71 changes are associated with the member *leaving* the team and/or board, while 63 changes are the *arrival* of a new member to the team and/or board.

**Table 4.7 The number and nature of team membership changes**

|   | Frequency |
|---|-----------|
| The number of firms experienced one or more changes | 75        |
| The number of team member departures                | 71        |
| The number of team member additions                 | 63        |

The characteristics of the academic spin-offs in our sample are summarised below. Most of the academic spin-offs are highly innovative, developing a product/service or a technology which is new internationally, or even developing completely new market. Almost half of the spin-offs originate from the Norwegian University of Science and Technology (NTNU) and the research institute SINTEF in Trondheim. Amongst our academic spin-offs, 40% have stayed in a university incubator. A quarter of the spin-offs have received seed financing while

about half of the firms (56%) have been financed by private investors. About a third of the spin-offs have been financed by industrial partners and another third by venture capitalists. The team and board sizes are generally quite small: on average they have 2.6 members on the management team and 3.8 members on the board. Two-third of the firms involve one or more academics on their top management teams, who spend one or more full-time equivalent working with the firm. About half of all firms have experienced membership changes on the team/board, where members have left or joined the team/board.

## **5 Distinctive team and board characteristics associated with successful academic spin-offs**

This section starts with a discussion of the results of the correlation analysis, which was carried out for the purposes of this report. As a result of this correlation analysis, several significant correlations between team/board variables and firm performance measures have been identified, and are discussed below. After this other distinctive characteristics associated with successful academic spin-offs are summarised, based on the findings from my dissertation. These distinctive characteristics are related to the board's value-adding role, networking, financing and team/board membership changes. These discussions are supplemented by the results of the correlation analysis.

### ***5.1 Firm performance and team characteristics***

In firms that develop a completely new technology management teams tend to have diverse management experience and a range of industrial backgrounds. In firms that have a product/technology similar to those already in the market, team members have more similar industrial backgrounds and boards have fewer external members (those who are not firm employees).

The longer the tenure of a CEO or team, the more satisfied firms are with their performance in terms of profits, sales, returns on assets, profitability, financing and the size of their market share (for example, this includes cases where a CEO has long been involved in the firm and team members have worked together many years).

The presence of the original founder in the firm also influences several of the performance measures: sales, market share, profitability, and profit. However, the correlation analysis cannot give us information about the degree of the founder's involvement (part-time or full time), or show if the founder's presence has a positive or negative effect on firm performance. Firms with teams that are more diverse in their functional and industrial backgrounds or their management experience tend to be more innovative.

## **5.2 Firm performance and board characteristics**

Similarly to the finding above regarding CEO tenure, firms with a board chair with a long tenure tend to be more satisfied with their sales. The firms that have satisfied customers often have a board chair who has extensive insight into the firm's activities and also a trustful leadership style.

Spin-offs that highly rate their innovation, in terms of the new products/services that they develop, tend to be those whose board chair has: (1) relevant industry knowledge, (2) great insight into the firm's activities, (3) is excellent at finding and engaging relevant board members, (4) has trustful leadership style. In such firms, the board chair is also usually (5) good at motivating board members, (6) is prepared for board meeting. Board members in more innovative spin-offs tend to be actively involved in the long-term strategies and overall goals.

## **5.3 Board's value-adding role**

In the case-based study (article 1), it was shown that new outside directors can bring critical resources that the top management team lacks (Bjørnåli & Gulbrandsen 2010). They may thus be considered to play a value-adding role. In each development stage the management team works on certain tasks and acquires necessary additional resources through new board members. The board members added in the first rounds are mostly investors and industry representatives helping to solve tasks related to securing financing and strategic positioning. The board members added in later rounds are investors, professional executives and those with market-specific knowledge aiding with the acquisition of other resources, organization and administration, and sales and marketing.

New outside directors were mainly selected from the network of the professional board chair. This chair came from outside the venture during the first board change and tended to remain in the company during all stages of growth influencing subsequent board additions. In less than half of the cases the chair represented the largest external stakeholder: venture capitalist or industry partner. In other cases the chair did not represent any major stakeholder, and thus contributed to the firm by finding new board members through his or her personal networks without having any influence as the largest external stakeholders might have.

To sum up, successful academic spin-offs have boards with qualities that complement the tasks spin-offs have to solve: in terms of providing access to or bringing relevant resources that top management team lacks. Board chair's social networks are important when it comes to finding new board members.

## **5.4 Networking and active boards**

The founders of our case study spin-offs emphasized that recruitment to the management team was as an important, even a critical activity, in their ventures. Therefore, in article 2, we have explored the role that the board of directors plays in the process of recruitment of new team members (Bjørnåli and Erikson 2010). We found that board size and the level of networking activity facilitate the addition of team members. That is, academic spin-off companies which

have larger, more active networking boards are more likely to add new members to their management teams.

According to the supplemental correlation analysis carried out for the purposes of this report, these more active networking boards are those boards where board chairs have the following qualities, the chair: (1) has long experience on the board, (2) has relevant industry knowledge, (3) is engaging and motivates new board members, (4) has an open leadership style and, (5) finds time for board duties. Board chairs with these many, apparently positive, qualities tend to be found in firms where board members are active with regard to board-related activities, in that: (a) they function as mentors for the CEO and the firm, (b) they are involved in the firm's long-term strategy and overall goals, (c) they have enough time to attend to board tasks and, (d) they are always well prepared for board meetings. These results seem to indicate that a board chair with many "positive" qualities manages to find board members who are active and also who are diverse in terms of their functional, industrial and educational backgrounds, as well as their international experience, personalities and ages. In summary it seems that networking boards are typically diverse in their backgrounds, active in implementing board tasks and have an active and professional board chair. Furthermore, firms that have a professional board chair, with many positive qualities, are more likely to be more innovative when it comes to the form of their new products/services.

In firms with networking and active boards, that are fulfilling board duties we usually find that: (a) the CEO and chair work well together, the relationship between them is fairly informal and they are confident in each other; (b) management team members have diverse prior start-up and managerial experience; and, (c) team performance is improved.

In firms that develop a product which is similar to existing products in the market, boards do not tend to increase firm's legitimacy, and firms to a little extent tend to utilize board member's networks to get advice.

In summary, successful academic spin-offs have boards who actively engage in network building, consistent strategic activities and other board duties. Board chair is active and enthusiastic and have a good working relationship with the CEO. There is diversity among board and team members' backgrounds and experiences.

## ***5.5 Board, team and financing***

The results of the article 3 show that the likelihood of attracting venture capital is increased if the spin-off firms were previously financed by seed and industrial capital (Bjørnåli et al. 2010). After the incubator period and until the academic spin-off may apply for more grants (e.g. R&D grant "IFU/OFU") from the Innovation Norway, there is a gap. This gap may be filled by seed capital, which is usually used to verify technology and map market opportunities and firm's competitive advantages. There are a number of nationwide and regional public-private seed capital funds. Some of them are supported by Innovation Norway. Recent evaluations of Norwegian seed capital funds show that seed capital funds should be larger if they are to fill the existing gap in demand for financial support (Grünfeld et al. 2009). According to Grünfeld et al. (2009), the majority of Norwegian TTOs assert that current seed funds make investments in academic spin-offs too late and take too little risk.

Under an industrial R&D scheme (i.e. "IFU" grant) an academic spin-off and a large industrial actor have to collaborate on new product development. One of the aims of the

scheme is the joint development of internationally competitive products by academic spin-offs with domestic and international industrial partners (customers). Whether a spin-off is supported by Innovation Norway through a public or industrial R&D grant or not, a venture may seek additional venture capital financing to nurture the company's growth. Venture capital firms usually invest in companies in the growth phase with considerable market-related risk. As our results show, the probability of receiving venture capital is higher if the spin-off has previously managed to attract seed capital or financing from industrial partners. To reiterate the relevant finding here, only 24% of the firms in the sample reported that they have received seed financing, while 14% had tried but failed to receive seed financing (see Table 4.4) and about one-third had been financed by industrial investors. Along with finance, venture capital investors can also provide resources related to strategic and service activities, giving advice and acting as "a door-opener" for an academic spin-off (Berg-Utby 2007).

The additional correlation analysis demonstrates that in seed financed firms the board chairs tend to: (1) have long-term board experience in other companies, (2) have an open leadership style and (3) find time to develop board's working processes and for board meetings. The only characteristic of board chairs which is significantly more common in venture capital financed firms is that they have long-term board experience from other companies.

As shown in article 3 (Bjørnåli et al. 2010), diversity in the functional and industrial backgrounds of management team members is the next most important characteristic (after seed and industry financing) that venture capital investors pay attention to. Venture capital investors either select teams who have members with this kind of diversity or appoint new members to the management team to achieve this diversity.

The findings correspond to our results from the case studies; when academic founders (with or without venture capital financing) were asked what they learned from their first start-up, they reported they "would put more emphasis on the team" and that one of the resources they needed most while getting established was industry experience and owners with relevant competences and networks, "not only money".

## **5.6 Team and board membership changes**

The results in article 2 suggest that the larger the board and the better the growth, the more likely it is a new team member will be recruited (Bjørnåli and Erikson 2010). Although it is not significant, our third firm performance variable, which measures the satisfaction with firm performance regarding market share, profit, sales and return on assets, is positively related to subsequent team member addition. Most of the survey respondents are CEOs and original founders in CEO, board chair and other positions. Thus, this positive relationship may indicate that when the CEO/founder is satisfied with firm performance he or she will most probably have a positive attitude toward the recruitment of new management team members. These results partly correspond to previous technology-based firm studies, which have demonstrated the U-shaped relationship between management team change and firm growth (Boeker and Karichalil, 2002; Boeker and Wiltbank, 2005). Both fast growth and a lack of start-up growth create the need for different top managers, but in the latter case "to help turn the new venture around" (Boeker and Wiltbank, 2005: 125).

In case-based article 1, we explored board formation and changes in board membership in academic spin-off companies in Norway and the US (Bjørnåli and Gulbrandsen 2010). At the

point of a spin-off being founded, the boards typically consisted of the scientist-entrepreneurs and people from the scientist-entrepreneurs' networks. Boards then underwent changes as the academic spin-offs grew. These changes were closely related to overcoming critical junctures and reaching the next development stage. In particular, the first change in board composition was positively related to the spin-off gaining credibility and moving to the Proof-of-Viability stage (see Fig. 2.1), while subsequent changes typically moved the academic spin-off closer to the subsequent, Maturity stage. These findings indicate that the additions of key board members are positively associated with the progress of a spin-off, in terms of moving it on from one stage to the next.

Due to few answers being provided regarding departures from the team and board in academic spin-offs, we are not able to make any robust statistical analyses of these changes. The consequences of departures appear to be mixed. Some departures are positive for the firms' strategy, leading to more focus on certain business areas; most departures of the CEO or management team members seem to be negative for firm performance, as they mean loss of needed competence. In light of this, departures from the team and board, the drivers of departures and their consequences for the team/board and firm performance remain an area for future research.

## 6 Implications

When forming a team, TTOs and entrepreneurs should pay attention to the task-related diversity in terms of functional and industrial backgrounds of the team members. This diversity is shown to be positively related to the academic spin-off's ability to recruit new management team members and attract venture capital financing (Bjørnåli and Erikson 2010; Bjørnåli et al. 2010). This is in line with previous research which demonstrates that early stage technology-based firms overcome various thresholds (e.g. receiving VC funding, going public) when they have teams that are complete in terms of the functions of marketing, finance, operations, and engineering (Roure and Maidique 1986; Zimmerman 2008; Beckman et al. 2007) and heterogeneous in industry experience (Chandler et al. 2005). For practitioners seeking further firm development, this implies that they should adjust the team's functional and industrial diversity by adding members with relevant expertise to the management team in order to enable growth and overcome the thresholds that an academic spin-off faces.

Although, the task-related diversity is important, yet, the results demonstrate that prior seed and industry financing appear to be the more important predictors of receiving venture capital financing than a management team's task-related diversity (Bjørnåli et al. 2010). This may imply that the management team's ability to accumulate seed and industrial financing prior to seeking venture capital plays a greater role than the team's background diversity per se. The findings suggest that previous seed funding and alliances with industrial partners are positively related to an academic spin-off's ability to attract venture capital. For policy makers, this means that they could stimulate seed capital funds to make investments in more academic spin-offs. Further, the industrial support schemes could be designed to facilitate greater involvement of strategic industrial partners in academic spin-offs.

Next, the findings point to that the board member additions may be seen as an effect of spin-off's progress to a new stage, but more as a driving force in the academic spin-off development (Bjørnåli and Gulbrandsen 2010). An important policy message is therefore to include the perspective of board dynamics in mechanisms intended to support academic spin-



off development. For instance, certain types of public funding seeking to stimulate academic entrepreneurship could be made contingent on the ability to attract professional outside directors to the board of an academic spin-off.

Compared to well-established US TTOs whose involvement was basically limited to developing patenting and licensing agreements, we found that young TTOs in Norway played a much more active role in ASOs (ibid.). They were represented on the spin-off board and in some cases the management team, picking new board members and participating in other strategic decisions. Despite this active involvement during the legal incorporation and early post-startup period, the Norwegian spin-offs seemed to have a slower rate of development in post-startup stages. The active participation of Norwegian TTOs in academic spin-offs may be explained by their goal, which is to secure a future income for themselves and their universities. Also, as TTOs are newly established it is important for them to demonstrate their legitimacy and importance in aiding technology transfer and spawning new firms – following recent legislative changes that some academics still do not welcome. There may thus be a conflict of interest for the TTO staff as representatives of the university (Mosey and Wright 2007), since involving outsiders may reduce their role and potential income. Public academic spin-off support programs and seed capital funds, which exist in Norway and most other countries interested in stimulating academic entrepreneurship, should be aware of this and moderate the financial expectations to TTOs.

Until recently, the legal establishment of a spin-off company was regarded as a significant event for Norwegian TTOs, and they received extra funding for this (Bjørnåli and Gulbrandsen 2010). The pitfall here is therefore also related to premature formal establishment of an academic spin-off before all necessary resources have been acquired and developed. Public support mechanisms should be tailored so that they could prevent the premature formal spin-off establishment. As shown in the case data, after such early legal start-up some scientist-entrepreneurs were frustrated by a lack of progress. So, attracting the first key outside directors who were also the main resource providers was experienced as an “actual” start-up enabling the academic spin-off to develop the business further. The challenge for TTOs is, in other words, to find a balance between acting as a representative of the university and as a wider societal institution (ibid.).

To policy-makers and practitioners, we suggest that there may be a need to develop policies that support academic spin-offs in finding outside directors. Efforts to develop networks and relationships with professional board members – investors, industrial members, and executives – may be an important additional component in general and specific assistance programs. This may imply that TTOs should recruit staff and/or develop relationships with people who have long-term board experience and relevant industry experience. Such people would be able to provide greater insights into spin-off firms’ activities, a task which is quite challenging considering that most academic spin-offs develop unique or completely new technology/products and aim at industry niches or even new markets. Academic spin-offs therefore require highly skilled outside directors, with unique, relevant expertise, who have good networks and access to complementary resources. Such skills may help address the concerns that academic spin-offs are being created without the necessary resources to develop the business further.

## 7 Conclusions

This report has sought to investigate the role of top management teams and boards of directors in academic spin-off companies. The findings show that boards in successful academic spin-offs add value by bringing in necessary resources that the management team lacks. In growing firms boards are also important in networking and in fulfilling strategic tasks and other duties. Larger and more active networking boards facilitate the recruitment of new people to the management team. Additions of new CEOs and management team members usually have a positive impact on firm performance. Firms with networking boards are characterized by more effective teams. Additions to the board are associated with the progress of an academic spin-off, such as in moving from one development stage to the next. The board chair's personal networks are important for finding new potential board members. In most innovative firms the board chair is active and has a good working relationship with the CEO. Effective management teams have diverse functional and industrial backgrounds and are better able to attract new team members and secure venture capital financing than less diverse teams. Previous seed and industry financing increase the probability of attracting venture capital.

We recommend that policy makers develop policies that meet the needs of academic spin-offs in terms of finding professional, outside directors. Efforts to develop networks and relationships with potential board members – investors, industrial partners, executives – would address the concerns that academic spin-offs start up without the necessary resources to move the business forward. We also recommend that seed funds be stimulated to make more investments in academic spin-offs, and that more industrial schemes could be designed to stimulate greater involvement of industrial actors in academic spin-offs.

## Literature

- Beckman, C. M., M. D. Burton and C. O'Reilly (2007), 'Early teams: The impact of team demography on VC financing and going public', *Journal of Business Venturing*, **22** (2), 147-173.
- Berg-Utby, T. (2007). *Venture capital ownership: Perspectives on the venture-capitalist/New-venture team relationship*, Doctoral dissertation. Trondheim, Norway: NTNU Norwegian University of Science and Technology.
- Birley, S. (2002). Universities, academics, and spinout companies: Lessons from imperial. *International Journal of Entrepreneurship Education*, 1(1), 1-21.
- Bjørnåli, E. S. (2009), 'Board of directors, top management team and the development of academic spin-off companies', Doctoral dissertation, Trondheim, Norway: NTNU Norwegian University of Science and Technology.
- Bjørnåli, E. S. and M. Gulbrandsen (2010), 'Exploring board formation and evolution of board composition in academic spin-offs', *Journal of Technology Transfer*, **35** (1), 92-112.
- Bjørnåli, E. S. and T. Erikson (2010), 'Board features associated with new team member addition in academic spin-offs', forthcoming in: C. Brush, L. Kolvereid, L. Widding, R. Sørheim and E. Bullvåg (eds), *The life cycle of new ventures: A cross national investigation*, Edward Elgar Pub.
- Bjørnåli, E. S., R. Sørheim and T. Erikson (2010), 'Design characteristics associated with venture capital acquisitions in academic spin-offs', forthcoming in: C. Brush et al. (eds), *The life cycle of new ventures: A cross national investigation*, Edward Elgar Pub.
- Boeker, W. and R. Karichalil (2002), 'Entrepreneurial transitions: factors influencing founder departure', *Academy of Management Journal* **45** (4), 818-826.
- Boeker, W. and R. Wiltbank (2005), 'New venture evolution and managerial capabilities', *Organization Science*, **16** (2), 123-133.
- Borlaug, S. B., L. Grünfeld, M. Gulbrandsen, E. Rasmussen, L. Rønning, O. R. Spilling and E. Vinogradov (2009). *Between entrepreneurship and technology transfer: Evaluation of the FORNY programme*. Rapport, 19. Oslo: NIFU STEP.
- Chandler, G. N., B. Honig and J. Wiklund (2005), 'Antecedents, moderators, and performance consequences of membership change in new venture teams', *Journal of Business Venturing* **20** (5), 705-725.
- Ensley M. D., A. W. Pearson and A.C. Amason (2002), 'Understanding the dynamics of new venture top management teams: cohesion, conflict, and new venture performance', *Journal of Business Venturing*, **17** (4), 365-386.
- Ensley, M. D. and K. M. Hmieleski (2005), 'A comparative study of new venture top management team composition, dynamics and performance between university-based and independent start-ups', *Research Policy*, **34** (7), 1091-1105.
- Filatotchev, I., S. Toms and M. Wright (2006), 'The firm's strategic dynamics and corporate governance life-cycle', *International Journal of Managerial Finance* **2** (4), 256-279.
- Franklin, S., M. Wright and A. Lockett (2001), 'Academic and surrogate entrepreneurs in university spin-out companies', *Journal of Technology Transfer* **26** (1-2), 127-141.
- Fredriksen, Ø. and Klofsten. M. (1999), CEO vs board typologies in venture-capital-entrepreneur relationships, in P. D. Reynolds, W. D. Bygrave, S. Manigart, C. M. Mason et al. (eds), *Frontiers of Entrepreneurship Research*, Babson College, pp. 335-348.
- Grünfeld, L. A., G. Grimsby, T. Clausen and E. Lier Madsen (2009), *Veksthus eller såkorn til spille: Evaluering av ordningene for såkornfond under Innovasjon Norge* (Greenhouse or wasted seed capital: Evaluation of seed fund schemes under Innovation Norway), MENON-publication, nr 5.
- Kamm, J., Schuman, J., Seeger, J. and Nurick, A. (1990). 'Entrepreneurial teams in new venture creation: a research agenda. *Entrepreneurship Theory and Practice*, 14(4): 7-17.
- Kazanjian, R. K. (1988), 'Relation of Dominant Problems to Stages of Growth in Technology-Based New Ventures', *Academy of Management Journal*, **31** (2): 257-279.

- Lindholm-Dahlstrand, Å. and M. Klofsten (2002), Growth and innovation support in Swedish science parks and incubators, in R. Oakey, W. Daring, and S. Kauser (eds) *New Technology-Based Firms in the New Millennium*, Vol. II, Oxford, UK: Elsevier Science, pp. 30-46.
- Lockett, A., D. Siegel, M. Wright & M. D. Ensley (2005). The creation of spin-off firms at public research institutions: Managerial and policy implications. *Research Policy* 34(7): 981-993.
- Lynall, M. D., B. R. Golden and A. J. Hillman (2003), 'Board composition from adolescence to maturity: A multitheoretic view', *Academy of Management Review*, **28** (3), 416-431.
- Mosey, S. and Wright, M. (2007), 'From human capital to social capital: A longitudinal study of technology-based academic entrepreneurs', *Entrepreneurship Theory and Practice*, **31** (6), 909-935.
- O'Shea, R., T. J. Allen, C.O. Gorman & F. Roche (2004). Universities and Technology Transfer: A Review of Academic Entrepreneurship Literature. *Irish Journal of Management* 25(2): 11-29.
- Pfeffer, J. and G. Salancik (1978), *The external control of organizations: a resource dependence perspective*, New York: Harper & Row.
- Rasmussen, E. and R. Sørheim (2006), 'Action-based entrepreneurship education', *Technovation*, **26** (2), 185-194.
- Rasmussen, E., O. J. Borch, R. Sørheim and A. Gjellan (2006a), *Government initiatives to support the commercialization of research - an international benchmarking study*. Norway, Bodø: Handelshøgskolen i Bodø.
- Rasmussen, E., Ø. Moen and M. Gulbrandsen (2006b), 'Initiatives to promote commercialization of university knowledge', *Technovation*, **26** (4), 518-533.
- Rasmussen, E., R. Sørheim and Ø. Widding (2007). Gjennomgang av virkemidler for kommersialisering av forskningsresultater. Norway, Bodø: Handelshøgskolen i Bodø.
- Roure, J. and M. Maidique (1986), 'Linking prefunding factors and high-technology venture success: an exploratory study', *Journal of Business Venturing*, **1** (3), 295-306.
- Selznick, P. (1949), *TVA and the Grass Roots : a Study in the Sociology of Formal Organization*, Berkeley, CA: University of California Press.
- Shane, S. (2004). *Academic Entrepreneurship: university spinoffs and wealth creation*. USA: MA, Edward Elgar Publishing.
- Sørheim, R. (2003), *Informal investors as financiers of entrepreneurial firms in Norway*, Doctoral dissertation. Trondheim, Norway: NTNU Norwegian University of Science and Technology.
- Spilling, O. R., M. Gulbrandsen and T. B. Hansen (2006). *Evaluering av NTNU Technology Transfer*. Arbeidsnotat, 36. Oslo: NIFU STEP.
- Vanaelst, I., B. Clarysse, M. Wright, A. Lockett, N. Moray and R. S'Jegers (2006), 'Entrepreneurial Team Development in Academic Spinouts: An Examination of Team Heterogeneity', *Entrepreneurship Theory and Practice*, **30** (2), 249-271.
- Vohora, A., M. Wright and A. Lockett (2004), 'Critical junctures in the development of university high-tech spinout companies', *Research Policy*, **33** (1), 147-175.
- Wright, M., A. Lockett, B. Clarysse, M. Binks (2006), 'University spin-out companies and venture capital', *Research Policy*, **35** (4), 481-501.
- Wright, M., A. Vohora and A. Lockett (2004). The formation of high-tech university spinouts: The role of joint ventures and venture capital investors. *Journal of technology transfer* 29 (3-4): 287-310.
- Wright, M., B. Clarysse, P. Mustar and A. Lockett (2007), *Academic entrepreneurship in Europe*, Cheltenham: Edward Elgar Publishing.
- Zimmerman, M. A. (2008), 'The influence of top management team heterogeneity on the capital raised through an initial public offering', *Entrepreneurship Theory and Practice*, **32** (3), 391-414.

## Appendix

**Table 1 Cases overview\***

| Firm and Board characteristics   | Academic spin-offs Norway                                 |   |  |                                       |  | Academic spin-offs US                                     |                           |  |                                   |   |                           |
|--|---|---|--|---------------------------------------|--|---|---------------------------|--|-----------------------------------|---|---------------------------|
|  | Biomedical  | Nutrimet  | Optical                                  | Chemical                              | Software   | Biotech 2   | SemiCon 1                 | SemiCon 2  | Biotech 1                         | SemiCon 3                                 | SemiCon 4                 |
| Establishment year   | 1998  | 1999  | 2001                                     | 2001                                  | 2004   | 1998  | 2000                      | 2001   | 2003                              | 2004                                      | 2004                      |
| Parent organization  | The Norwegian Forest and Landskape Institute              | The Foundation for Scientific and Industrial Research | Norwegian Defence Research Establishment | Norwegian University of Life Sciences | Norwegian University of Science and Technology   | Stanford university                                       | Stanford university       | University of Michigan                                 | UC Berkeley                       | UC Berkeley                               | University of Michigan    |
| Number of full-time employees in 2007                                      | 15  | 7 Norway, 16 abroad                                   | 5  | 0                                     | 3  | 10  | 25                        | 25   | 69                                | 25  | 20                        |
| Degree of innovation   | New technology (drug, medicine), patented internationally |   |  |                                       | Not patented                                     | New technology (drug, medicine), patented internationally |                           |  |                                   |   |                           |
| Stage of development   | Maturity  | Proof of viability                                    | Proof of viability                       | Proof of viability                    | Proof of viability                               | Maturity  | In transition to Maturity | Maturity   | Maturity                          | In transition to Maturity                 | In transition to Maturity |
| Founding team size   | 3   | 3   | 4  | 5                                     | 7  | 3   | 2                         | 3  | 3                                 | 4   | 4                         |
| Positions of academic inventors held in the company (current and previous) | Product development dir., R&D dir., CEO, board members    | Short period CEO, board chairman, board members       | CEO, CTO, board chairman, board members  | Board chairman, board members         | VP technology development, VP R&D, board members | CEO, board members  | CTO, President            | CTO, Chief Science Officer, R&D Director, board member | VPs R&D, President, board members | President and CTO, founder / board member | CTO, board member         |
| Board size in 2007   | 6   | 7   | 4  | 4                                     | 4  | 8   | 9                         | 7  | 8                                 | 7   | 6                         |
| Number of board membership changes   | 6   | 6   | 4  | 2                                     | 2  | 8   | 7                         | 7  | 6                                 | 3   | 3                         |

\*from the study by Bjørnåli and Gulbrandsen (2010), Journal of Technology Transfer, 35 (1), 92-112

## Questionnaire

Selected questions (in original language)

### Del A. Om bedriften

A2a Hvilken forskningsenhet (universitet) kommer teknologi/gründere fra? .....

A2b Hvilken kommersialiseringsaktør / Technology Transfer Office har bedriften benyttet seg av? .....

A3 Hvilke aktiviteter beskriver bedriften best?

- |  |  |
|--|--|
| <input type="checkbox"/> <sub>1</sub> Olje og gass                     | <input type="checkbox"/> <sub>2</sub> IKT                          |
| <input type="checkbox"/> <sub>3</sub> Medtek / biomedisin              | <input type="checkbox"/> <sub>4</sub> Bioteknologi / næringsmidler |
| <input type="checkbox"/> <sub>5</sub> Marin / akvakultur               | <input type="checkbox"/> <sub>6</sub> Maritim / offshore           |
| <input type="checkbox"/> <sub>7</sub> IKT / Helse                      | <input type="checkbox"/> <sub>8</sub> Energi/miljø                 |
| <input type="checkbox"/> <sub>9</sub> Annet, vennligst spesifiser..... |  |

A4 Hvor mange årsverk arbeider i bedriften:

|                | 2004 | 2005 | 2006 | 2007 | 2008 | Estimat for 2009 |
|----------------|------|------|------|------|------|------------------|
| Antall årsverk |      |      |      |      |      |                  |

A5 Har bedriften vært lokalisert i:

- <sub>1</sub> Inkubator    <sub>2</sub> Forsknings- eller kunnskapspark    <sub>3</sub> Næringshage    <sub>4</sub> Ingen av disse

A6a Hvordan vil du karakterisere nyskapingsgraden på produkt, teknologi og marked? (kryss av i alle boksene som passer)

- <sub>1</sub> Produktet eller tjenesten er helt nytt i markedet  
<sub>2</sub> Teknologien er helt ny i markedet  
<sub>3</sub> Markedet for produktet/tjenesten eller teknologien er helt nytt  
<sub>4</sub> Tilsvarende produkt/tjeneste, teknologi, marked eksisterer

A6b Hvis det er et helt nytt produkt eller tjeneste; er det tale om nytt i: <sub>1</sub> Norge    <sub>2</sub> Internasjonalt

A7 I hvilket stadium av livssyklusen befinner selskapet seg? (**sett kun ett kryss**)

- <sub>0</sub> Tidlig fasen: Vi jobber med å vurdere kommersiell potensial og styrke intellektuelle rettigheter, vi søker om patent eller prøver å beskytte teknologien som skal ligge til grunn i produktet/tjenesten.  
<sub>1</sub> Utviklingsfasen: I denne fasen utvikles produktet/tjenesten og er kun i begrenset grad introdusert på markedet. Omsetningen er lav.  
<sub>2</sub> Etablerings-/introduksjonsfasen: Selskapets produkt/tjeneste blir gradvis mer introdusert på markedet.  
<sub>3</sub> Vekstfasen: Selskapet vokser sterkt og investeringer kan være nødvendig for videre utvikling. Selskapets produkt/tjeneste kan være introdusert på flere markeder, og omsetningen øker.  
<sub>4</sub> Modningsfasen: Omsetningen flater ut, og selskapet har nådd de kunder som kan forventes å være aktuelle innenfor dagens satsningsområder.

A10a Siden oppstart hvordan er bedriftens:

- |                                    | Mye dårligere                         |                                       |                                       |                                       |                                       |                                       |                                       | Mye bedre |
|------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-----------|
| • vekst i salg                     | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |           |
| • vekst i markedsandel             | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |           |
| • kvalitet i produkter/tjenester   | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |           |
| • innovasjon i produkter/tjenester | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |           |
| • kundetilfredshet                 | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |           |
| • lønnsomhet                       | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |           |
| • finansiering                     | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |           |

A10b Vår bedrift er fornøyd med:

Helt uenig Helt enig

|                       |                          |                          |                          |                          |                          |                          |                          |
|-----------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| • markedsandel        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • resultat            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • salg                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| • kapitalrentabilitet | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## Del B. Om ledelse

B1 Hvor lenge har lederen arbeidet i bedriften? Antall år: \_\_\_\_\_

B2 Er bedriftens leder også: <sub>1</sub> Styreleder <sub>2</sub> Styremedlem <sub>3</sub> Ingen av disse

B3 Hvor mange personer inngår i **lederteamet** (ikke inkludert styret)? Antall: \_\_\_\_\_

B4 Hvor mange personer består **styret** av? Antall: \_\_\_\_\_

B7 Hvis den opprinnelige grunnleggeren fremdeles er involvert i bedriften hvor stor stillingsprosent har vedkommende nå i bedriften, og hvilken posisjon har vedkommende? .....

B8a Hvilke og hvor mange personer består lederteamet av og hvor mange årsverk utgjør de i bedriften:

|  | Antall personer | Ca. årsverk |
|--|-----------------|-------------|
| • akademikere, professorer, forskere, PhD studenter                |                 |             |
| • studenter som tar eller har tatt studier på masternivå ol.       |                 |             |
| • medlemmer med tilknytning til TTO, inkubator ol.                 |                 |             |
| • medlemmer uten tilknytning til forskningsinstitutt / universitet |                 |             |

B9 Hvor mange personer i lederteamet har tidligere jobbet innenfor samme bedrift (ikke nødvendigvis i samme periode). Velg maksimalt tall, f. eks. hvis 3 ledere tidligere jobbet i Sintef og 2 andre ledere jobbet i Microsoft, skriv 3. Antall personer: .....

B10 Hvor mange utskiftninger i lederteamet har det vært siden bedriften ble etablert? .....

Tenk nå på den **viktigste / kritiske utskiftningen** i lederteamet (eller styret hvis det ikke har vært utskiftninger i lederteamet):

B11 Handler det om: (Vennligst kryss av i alle boksene som passer)

<sub>1</sub> en person som *forlot* lederteamet Årstall: .....

<sub>2</sub> en ny person som *har blitt ansatt* i lederteamet Årstall: .....

B12a Hvilken rolle / stilling hadde vedkommende som forlot lederteamet eller styret i bedriften?

.....

B12b Hvilken rolle / stilling har den nye personen fått i bedriften?

.....

B13 Hva var **årsaken** til at det har blitt utskiftning i lederteamet eller styret?

| Ranger årsaker til at vedkommende forlot ledelsen (1 – største årsak osv.) | Rang 1 til 5 |
|--|--------------|
| • Vedkommende kom i konflikt med andre                                     |              |
| • Vedkommende tok gale strategiske beslutninger                            |              |
| • Vedkommende ønsket seg en annen jobb / hadde ikke tid                    |              |
| • Hovedeier(e) ønsket at vedkommende forlot ledelsen                       |              |
| • Andre årsaker, vennligst spesifiser .....                                |              |

### Ranger årsaker til at vedkommende ble ansatt i ledelsen (1 – største årsak osv.)

|  |  |
|--|--|
| <input type="checkbox"/> Vi ønsket oss den kompetansen vedkommende hadde                 |  |
| <input type="checkbox"/> Vedkommende skulle erstatte personen som forlot bedriften       |  |
| <input type="checkbox"/> Bedriften vokste og vi trengte en som kunne lede nye avdelinger |  |
| <input type="checkbox"/> Hovedeier(e) ønsket at vedkommende ble med i ledelsen           |  |
| <input type="checkbox"/> Andre årsaker, vennligst spesifiser .....                       |  |

B14 Hvilke *positive* og/eller *negative* konsekvenser innebar personbyttet i ledelsen for bedriftens vekst / ytelse?

i tilfelle hvor vedkommende forlot ledelsen .....

i tilfelle hvor vedkommende ble ansatt i ledelsen.....

B15 Hvis en **ny person har blitt ansatt** i lederteamet, hvordan ble denne personen funnet?  
Gjennom:

|   |   |
|---|---|
| <input type="checkbox"/> 1 Etablereren av denne bedriften   | <input type="checkbox"/> 2 Hovedeier                            |
| <input type="checkbox"/> 3 Daglig leder                     | <input type="checkbox"/> 4 Styreformann                         |
| <input type="checkbox"/> 5 TTO / kommersialiseringsenhet    | <input type="checkbox"/> 6 Investors kontakter                  |
| <input type="checkbox"/> 7 Profesjonelle nettverk           | <input type="checkbox"/> 8 Rekrutteringsfirma, konsulenter osv. |
| <input type="checkbox"/> 9 Annet, vennligst spesifiser..... |   |

B17 Hva tilførte den personen som ble med i lederteamet ved viktigste / kritiske utskiftning?

|   |   |
|---|---|
| <input type="checkbox"/> 1 Erfaring fra markedsføring og salg       | <input type="checkbox"/> 2 Internasjonal erfaring                 |
| <input type="checkbox"/> 3 Kunnskap om markedet, industri, bransjen | <input type="checkbox"/> 4 Erfaring fra administrasjon og ledelse |
| <input type="checkbox"/> 5 Nødvendige kontakter                     | <input type="checkbox"/> 6 Annet, spesifiser.....                 |

B18a Teammedlemmene representerer meget stor bredde mht:

|   | I svært liten grad         |                            |                            |                            |                            |                            |                            | I svært stor grad          |                            |                            |                            |                            |                            |                            |
|---|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| • Funksjonell bakgrunn (f. eks. salg, finans osv.)          | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 |
| • Industriell bakgrunn                                      | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 |
| • Utdanningsbakgrunn  | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 |
| • Personlighet  | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 |
| • Alder   | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 |
| • Erfaring fra nyetableringer                               | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 |
| • Ledererfaring   | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 |
| • Internasjonal erfaring (jobbet i utlandet, er utenlandsk) | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 | <input type="checkbox"/> 6 | <input type="checkbox"/> 7 |

## Del C. Om finansiering

C1 Har bedriften kontaktet og eventuelt mottatt ekstern finansiering fra noen av de følgende aktørene?

|                                    | Nei, har ikke forsøkt      | Har forsøkt, men ikke mottatt kapital | Har mottatt kapital        |
|------------------------------------|----------------------------|---------------------------------------|----------------------------|
| • Familie                          | <input type="checkbox"/> 1 | <input type="checkbox"/> 2            | <input type="checkbox"/> 3 |
| • Såkornfond                       | <input type="checkbox"/> 1 | <input type="checkbox"/> 2            | <input type="checkbox"/> 3 |
| • Inkubatorstipend                 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2            | <input type="checkbox"/> 3 |
| • IFU / OFU støtte                 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2            | <input type="checkbox"/> 3 |
| • Øvrig støtte fra Forskningsrådet | <input type="checkbox"/> 1 | <input type="checkbox"/> 2            | <input type="checkbox"/> 3 |
| • Annet, spesifiser.....           | <input type="checkbox"/> 1 | <input type="checkbox"/> 2            | <input type="checkbox"/> 3 |

C2 Når ble det første gang hentet inn ekstern egenkapital fra private investorer (ikke familie)?

Årstall: ..... 2 Aldri

C3 Når ble det første gang innhentet kapital fra industrielle partnere?

Årstall: ..... 2 Aldri



- C4 Når ble det første gang innhentet kapital fra et venture kapital foretak? Årstall:..... <sub>2</sub> Aldri
- C5 Hvor mange ganger ble det innhentet kapital fra en venture kapital investor? Antall ganger: .....

Tenk nå på den siste **viktigste/største investeringen**:

C6 Hvem av de følgende investorer var det (ett kryss):

- <sub>1</sub> Privat investor / såkornfond <sub>2</sub> Industriell partner
- <sub>3</sub> Venture kapitalist <sub>4</sub> Andre, spesifiser.....

C9 Hvilken av følgende personer i bedriften hadde relasjoner til denne investoren fra tidligere?

- <sub>1</sub> Daglig leder <sub>2</sub> Medlem av vårt lederteam
- <sub>3</sub> Styreformann <sub>4</sub> Ekstern styremedlem
- <sub>5</sub> TTO / kommersialiseringsaktør <sub>6</sub> Ingen av disse

C12 Vennligst, ranger eierne i bedriften: 1 – største eier, 2 – nest største eier osv.:

- Daglig leder  Opprinnelige grunnleggere
- Venture kapital investorer  Øvrige investorer
- Industrielle partnere  TTO, kommersialiseringsenhet
- Ansatte  Andre eksterne eiere

## Del D. Om styret

D1 Styreleder er også (kryss av i alle boksene som passer)

- <sub>1</sub> Daglig leder <sub>2</sub> Grunnleggeren av bedriften <sub>3</sub> Representerer hovedeiere <sub>4</sub> Ingen av disse

D2 Hvor lenge har styreleder vært i bedriften? Ca \_\_\_\_\_ år

D3a Hvor mange styreverv innehar styreleder i andre selskap per i dag? Ca \_\_\_\_\_ styreverv

D4 Vår styreleder

- |   | Helt uenig                            |                                       | nøytral                               |                                       |                                       |                                       | Helt enig                             |
|---|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| • har lang styrearbeidserfaring fra andre selskap   | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • har relevant industri-/bransjeerfaring (i forhold til selskapets virksomhet)                                      | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • har god innsikt i selskapet (hovedaktiviteter, produkter)   | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • er fremragende til å finne og engasjere nye styremedlemmer med relevant kompetanse/kunnskap/nettverk              | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • er fremragende til å motivere og benytte kompetansen til hvert enkelt styremedlem                                 | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • har en åpen og tillitsfull lederstil  | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • arbeider hele tiden for å utvikle styrets arbeidsformer og prosesser, og er veldig godt forberedt til styremøtene | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |

D5 I hvilken grad er du enig med følgende påstander om styrets bidrag?

- |   | I svært liten grad                    |                                       |                                       |                                       |                                       |                                       | I svært stor grad                     |
|---|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| • Styremedlemmene bidrar til nettverksbygging   | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Styremedlemmene bidrar til lobbyvirksomhet og legitimering                                  | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Bedriften og styret benytter seg ofte av styremedlemmenes nettverk for å få råd             | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Styret og styremedlemmene fungerer som mentorer for daglig leder og bedriften               | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Styret er aktivt involvert i arbeidet knyttet til langsiktige strategier og overordnede mål | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |

• Styremedlemmene prioriterer nok tid til sitt styreoppdrag i selskapet og er alltid veldig godt forberedt til styremøtene <sub>1</sub> <sub>2</sub> <sub>3</sub> <sub>4</sub> <sub>5</sub> <sub>6</sub> <sub>7</sub>

| D6 Styremedlemmer representerer meget stor bredde mht | Helt uenig                            | nøytral                               |                                       |                                       |                                       |                                       | Helt enig                             |
|---|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| • Funksjonell bakgrunn (f. eks. salg, finans)         | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Industriell bakgrunn (f. eks. ulike bransjer)       | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Utdanningsbakgrunn                                  | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Personlighet (f. eks. ulike grad av kreativitet)    | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Alder   | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Internasjonal erfaring                              | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |

D8 Hvor mange styremedlemmer har følgende bakgrunn: \_\_\_ Venture kapital investorer  
 \_\_\_ TTO / kommersialiseringsaktørs representanter \_\_\_ Eksterne medlemmer (ikke ansatte)

| D9 Hvis daglig leder og styreleder ikke er den samme person, hvor enig / uenig er du i følgende påstander:         | Helt uenig                            |                                       |                                       |                                       |                                       |                                       | Helt enig                             |
|--|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| • Vår styreleder arbeider veldig godt med daglig leder   | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Begge parter er villige til å tilpasse den løpende relasjonen med henblikk på å imøtekomme endrede betingelser   | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Utveksling av informasjon forekommer ofte og uformelt og ikke kun ut fra forutgående avtaler                     | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Det forventes at vi holder hverandre informert om begivenheter eller endringer som kan påvirke den andre part    | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Problem som oppstår i denne relasjonen behandles av begge parter som et felles ansvar snarere enn et individuelt | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Vi ser ofte forskjellig på innholdet i beslutninger  | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |
| • Ofte har vi forskjellige meninger  | <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> | <input type="checkbox"/> <sub>6</sub> | <input type="checkbox"/> <sub>7</sub> |