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School of Economics and Management

BUDGETING PRACTICES IN INNOVATIVE COMPANIES

A CASE STUDY OF THREE INNOVATIVE COMPANIES

BY

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Abstract

Title: Budgeting and Innovation: A case study of three innovative companies

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Purpose: To analyze and discuss how budgets are designed and used in innovative companies. The two research questions that are investigated are: How do innovative companies design and use their budgetary systems? And why they choose to design and use them in that particular manner?

Method: A qualitative research method based on an exploratory multiple case studies.

Theoretical review: Integrative literature study of theories on budgeting, innovation and organizational lifecycle.

Empirical foundation: The empirical data was generated from interviews conducted with CFOs of three innovative companies.

Conclusion: The findings of this study show that innovative companies take different approaches when designing and using their budgetary systems. These differences can be explained by the organizational characteristics, such as the stages of organizational life cycle, as well as by the characteristics particularly associated with innovation, especially innovation process and innovation strategy in general.

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Table of contents

1. INTRODUCTION.....	6
1.1 BACKGROUND	6
1.2 PROBLEM DISCUSSION	7
1.3 PURPOSE AND RESEARCH QUESTIONS	9
1.4 STRUCTURE OF THE PAPER.....	9
2. RESEARCH METHOD	10
2.1 RESEARCH DESIGN.....	10
2.2 SELECTION OF COMPANIES	11
2.3 DATA COLLECTION	13
2.3.1 <i>Primary data</i>	13
2.3.2 <i>Secondary data</i>	15
2.4 DESIGN OF INTERVIEW GUIDE.....	15
2.5 LITERATURE REVIEW	16
2.6 DATA ANALYSIS	16
2.7 LIMITATIONS OF RESEARCH METHOD	17
2.8 VALIDITY AND RELIABILITY.....	17
3. THEORETICAL REVIEW	19
3.1 BUDGET	19
3.1.1 <i>Budget as a management control system</i>	19
3.1.2 <i>Functions of budgets</i>	20
3.1.3 <i>Budget Choices</i>	21
3.2 INNOVATION	25
3.2.1 <i>Definition and importance of innovations</i>	25
3.2.2 <i>Innovation process</i>	26
3.2.2 <i>Different innovative strategies</i>	26
3.2.3 <i>Innovation Project management</i>	28
3.3 ORGANIZATIONAL LIFE CYCLE	28
4. EMPIRICAL DATA.....	31
4.1 PROBI AB.....	31
4.1.1 <i>Background of the company</i>	31
4.1.2 <i>The Budgeting Process for the Overall Company</i>	31
4.1.3 <i>Innovation Strategy</i>	32
4.1.4 <i>Budgeting process for R&D activities</i>	33
4.2 CELLAVISION AB.....	34
4.2.1 <i>Background of the company</i>	34
4.2.2 <i>Budgeting process for the overall company</i>	34
4.2.3 <i>Innovation Strategy</i>	35

4.2.4 Budgeting process for R&D activities.....	36
4.3 ACTIVE BIOTECH AB.....	37
4.3.1 Background of the company.....	37
4.3.2 Budgeting process for the overall company.....	37
4.3.3 Innovation Strategy.....	38
4.3.4 Budgeting process for R&D activities.....	39
5. ANALYSIS AND DISCUSSION	40
5.1 COMPARISON OF COMPANIES' BACKGROUND AND LIFE CYCLES.....	41
5.2 THE BUDGETING PROCESS FOR THE OVERALL COMPANY	41
5.2.1 Budgeting alternatives.....	42
5.2.2 Budget setting approaches	43
5.2.3 Interactive use of budgets.....	44
5.2.4 Planning versus control function of budget	44
5.3 BUDGET AND INNOVATION.....	46
5.3.1 Role of budget for innovation strategy.....	46
5.3.2 Budgeting in innovation process.....	47
5.3.3 Budget flexibility for R&D activities	48
5.3.4 Prioritizing time over costs.....	49
6. CONCLUSION	50
6.1 SUMMARY OF FINDINGS.....	50
6.2 DISCUSSION OF RESEARCH CONTRIBUTIONS	51
6.3 LIMITATIONS AND AVENUES FOR FUTURE RESEARCH	52
7. REFERENCES.....	53
APPENDIX 1: LIST OF QUESTIONS FOR THE INTERVIEW GUIDE	60

List of Tables

Table 1 List of interviewed companies	14
Table 2 Strategic concept for management control system.....	27
Table 3 Summary of findings	40

List of Figures

Figure 1 New Ideas and Capacity-Based framework for Innovation Process	26
Figure 2 Organizational Life Cycles	29
Figure 3 Innovation process of Probi	33
Figure 4 Innovation process of CellaVision.....	36
Figure 5 Innovation process of Active Biotech	38

1. Introduction

In this section, an introduction to the research paper will be presented to provide an overview of the research topic and its relevance. The section further presents in detail the discussion regarding the problem at hand. In addition, the section offers the purpose of the thesis and the questions that we want to address. Finally, it presents the structure of the thesis.

1.1 Background

In recent years there has been an increased interest in exploring the relationships between formal management control systems and innovations; a significant body of literature has examined the use of formal controls in innovation settings (Abernethy & Brownell, 1997; Davila, 2000; Bisbe & Otley, 2004; Davila, 2005; Dunk, 2011; Haustein et al., 2014). Traditionally, formal management control systems have been argued to present a hindrance to any innovation, creativity and change effort due to the cybernetic, command and control mechanism by which these systems are characterized (Burns & Stalker, 1961). They are highly formal, articulating action plans resulted from deliberate strategies by means of detailed budgets, and requiring minimization of variances from these plans; this type of control tends to be mechanistic and may reinforce the extrinsic contractual relationships of hierarchical organizations, and therefore may be considered inconsistent with innovation (Chenhall & Morris, 1995). Innovation is associated with uncertainty, intrinsic motivation, freedom and creativity (Davila, 2005). It requires flexibility, experimentation and exploration of new opportunities that can be blocked for the sake of efficiency and achievement of pre-determined objectives (Jorgensen & Messner, 2009). Budget as the major formal control tool has received the greater part of this criticism (Wallander, 1999; Gurton, 1999; Hope & Fraser, 2003).

However, some recent studies have questioned the negative effects of formal management systems on innovation and have found that they may be flexible and dynamic to meet the needs of innovations (Simons, 1995; Abernethy & Brownell, 1999; Bisbe & Otley, 2004; Davila, 2005; Haustein et al., 2014). The contradictory findings regarding the effects of formal management control systems on successful innovation as claimed in prior literature are explained by different attributes related to the design and use of formal controls. Simons (1995) has pointed to the different styles of use and distinguished diagnostic and interactive styles of use of formal management control systems. Adler and Borys (1996) identified two types of formalization of controls: enabling and coercive bureaucracies. Some authors explored different roles of formal controls and their effects on innovation (Hansen et al., 2004; Dunk, 2011). Similarly, Davila (2005) stated that unsuitability of formal controls for innovation comes from limiting their roles only to executing the deliberate strategy. He suggested four models of design of management control systems conditioned by the ways in which innovation gets embedded in the strategy (Davila, 2005). Similarly, Haustein et al.

(2014) explored different designs of management control systems that determine their influence and effects in innovation settings.

Accordingly, innovative companies should devote particular attention to the design of management controls (Haustein et al, 2014). Furthermore, the approach to using controls is argued to play a more significant role than the design of controls, and it is not sufficient to investigate the effects of controls without examining how they are used (Langfield-Smith, 1997). Exploration of design and use of formal controls in innovative company settings is of particular interest because these companies have specific requirements concerning their management control systems: they should balance between their needs for control and creativity for developing innovations, between efficiency and flexibility (Haustein et al, 2014).

1.2 Problem discussion

Budgets are regarded as one of the major formal management control tools widely used in organizations (Abernethy & Brownell, 1999; Dunk, 2011). Their ability to coordinate the allocation of resources through internal communication and expenditure authorization has made them an important part of the planning and control system (Hansen & Van der Stede, 2004). Budgets enable the organizations to control costs and achieve desired financial goals that are important for their survival (Merchant, 1998). However, budgets are often strongly criticized by academics and accused of stifling innovation and learning, which are increasingly important for long-term survival of firms (Wallander, 1999; Hope & Fraser, 2003). They are argued to encourage stability, individualism and risk-averseness, whereas innovation emphasizes experimentation, initiative, and creativity and depends on cooperation, acceptance of change and risk-taking (Marginson et al, 2006).

An increasingly globalized and competitive environment demands both cost control to maintain profit margins and innovation to underpin competitiveness (Marginson et al, 2006). Jørgensen and Messner (2009) argued that organizations face a major challenge in finding reasonable ways to balance the tensions between efficiency consideration and promoting innovation simultaneously. Yet both innovation and cost control are needed for the survival of a company. Innovation facilitates companies gaining competitive advantage and is often described as being an important part of the strategy (Dunk, 2011; Lengnick-Hall, 1992). Companies need to continuously and rapidly modify their product feature and the ways in which they conduct business operations, to gain competitive advantage (Lengnick-Hall, 1992). Innovation is critical to growth in a competitive environment (Davila et al., 2012). However, the costs of innovation have been increasing due to higher costs for personnel, equipment, regulations and testing, and the companies are increasingly calling for a greater budgetary control on the development and marketing of innovative products (Dunk, 2011). This entails difficulties for both innovation and budgetary control: budgets lack historical data to base budget predictions when developing and marketing new products; the uncertainty surrounding innovation creates problems for the evaluation of performance on basis of budget (Marginson et al., 2006). At the same time, the creativity of scientists involved in innovation process should not be constrained by cost concerns (Shields & Young, 1994). Furthermore, a

strong emphasis on meeting the budget targets may create behavioral side effects on innovation, and pressures to perform in the present diminish the probability of initiating new projects and undermine the commitment to innovation (Van der Stede, 2000). The tensions between budget and innovation present one of the reasons for a strong critique against budgets. Hope and Fraser (2003) even advocate the abandonment of traditional budgetary systems since such systems are an impediment to the changes and flexibility required in a fast-moving and innovative environment.

However, despite these criticisms, studies have shown that the vast majority of organizations still use budgets (Ekholm & Wallin, 2000; Arwidi & Jonsson, 2010; Sandalgaard, 2012). Furthermore, the recent research by Marginson et al. (2006) has shown that budget can be exercised in a way that will not hinder the innovation of a firm. Similarly, Dugdale and Lyne (2010) provide evidence to argue that budgeting is not detrimental to company competitiveness and that the managers are largely satisfied with their budgeting systems. Abernethy and Brownell (1999) examined the important role of budget when firms undergo strategic change. Moreover, Bisbe and Otley (2004) reported that budgets block excesses of innovation and ensure the effective product innovation. Similarly, the results of the study conducted by Dunk (2011) show that budget can facilitate product innovation impacting positively on the performance.

These contradictory findings regarding the interplay between budget and innovation are explained by different attributes related to the design and use of budgets. There is a number of choices that companies should make regarding budget setting process, whether the budget should be flexible, how budget should be used to evaluate performance (Churchill, 1984), how tight budget should be (Van der Stede, 2001). Further, there are two different styles of use of budget: diagnostic and interactive styles that differently affect innovation (Simons, 1995; Bisbe & Otley, 2004). Moreover, a budget may serve a number of different roles or purposes in the organizations (Samuelson, 1986) and the emphasized role is critically important in relationships with innovation (Churchill, 1984; Dunk, 2011). Similarly, Davila (2005) pointed different roles of budget defined by the different types of innovation and different ways in which it emerges in an organization. He argues that the budget becomes coercive and stifles innovation when it is used only for executing the deliberate strategy, but on the other hand, it is crucial to translate innovation into value. In contrast, budgets can be used to discover opportunities for innovations and changes in strategy that respond to the risks of deliberate strategy (Davila, 2005).

Taking into account the above mentioned contradictory findings regarding the interplay between the budget and innovation and a number of budget choices the companies should make regarding design, use and role of their budgetary systems, we are interested to explore how innovative companies design and use their budgetary systems in practice, and why they make these particular choices.

1.3 Purpose and Research Questions

The purpose of this paper is to analyze and discuss how budgets are designed and used in innovative companies. In line with the purpose of the paper, we will wish to address the following questions in order to make a critical evaluation and analysis.

1. How do innovative companies design and use their budgetary systems?
2. Why they choose to design and use their budgetary systems in that particular manner?

1.4 Structure of the paper

The structure of the thesis will be presented in the following order. We will first describe, in chapter 2, the research method with the arguments for our choice of method. The chapter will continue with other relevant procedures undertaken in this research. Afterwards, chapter 3 will present the theoretical framework of the research paper. It will entail the work of prior researchers in budgeting and innovation that will be meaningful for the analysis of our thesis. Subsequently, chapter 4 will provide a presentation of our empirical data generated from three cases. Chapter 5 will present our analysis and discussions made from the cases. Finally, chapter 6 will conclude the summary of the analysis and discussion. The chapter will also provide the limitations of our research, the contributions of the research and avenues for future research.

2. Research method

In this section, we provide in detail the research design of this thesis and the motivation for our choice of method. We also present an extensive description of the selection of companies as well as our data collection techniques and sources. Further, we explain the design of our interview guide, how we reviewed the literature and how we will analyze the data. We also acknowledge the limitation of the research method and provide the reliability and validity of the research.

2.1 Research Design

Based on the purpose of this research, which requires detailed analysis, we consider a qualitative research method to be the most appropriate to undertake. According to Silverman (2005), a qualitative research method is the most suitable and applicable if the researchers wish to study a phenomenon or a situation in detail. In addition, the method facilitates exploration of a phenomenon using a variety of data sources (Baxter & Jack, 2008). This ensures that the research problem is not explored through just one source, but rather through several sources which allows the phenomenon to be accurately and accordingly revealed and understood. Moreover, several researchers (Marginson, Ogden & Frow, 2006; Granlund & Taipaleenmäki, 2004; Davila, Foster & Oyon, 2009; Dutta, 1996; etc.) in the field of budgeting and innovation or R&D used a qualitative method in their respective researches. Further, with qualitative research, the researchers have the capacity to constitute the arguments about how things work in a particular context (Mason, 2011). For these reasons, we deem it necessary to adopt this method in order to effectively evaluate how and why innovative companies design and use their budgets.

Further, Creswell (2007) classified different types of qualitative research approaches, which include grounded theory study, ethnography, case study etc. From this classification, we used a case study research approach. According to Yin (2009), a case study method is the most appropriate to use, if the researchers wish to address and answer the “how” and “why” questions. In line with this argument, we adopt a case study method because our aspiration in this paper is to address how innovative companies design and use their budgets and not what type of budget they use. The “how” and “why” questions deal with operational links wanting to be traced over time, rather than mere frequencies (Yin, 2009).

Moreover, a case study research method allows the researchers to retain the holistic characteristics of real-life situation, such as the behavior of an entity and its organizational and managerial process (Yin, 2009). For the purpose of this paper, we believe that, a case study research method will enable us to acquire a more comprehensive understanding regarding the problem at hand. A case study research offers a more insight into the situation being studied that might not be achieved using other approaches such as survey (Rowley, 2002). Saunders et al. (2009) acknowledged the importance of using a case study method and added that, the method will be of particular interest if the researcher wants to gain a richer and deeper understating of the context of the research problem.

Another advantage of using a case study research method is that, it offers the researcher the ability to collect variety of evidence from different sources including documents, interviews, observation and artefacts; which goes beyond the sources of data collection that might be available in other methods such as historical study (Rowley, 2002). In line with this argument, we collected data for this research paper from a variety of sources (see data collection part for detail discussion).

Yin (2003) characterizes the different types of case study strategies into four; holistic case, embedded case, single case and multiple case. Based on this classification, we adopt a multiple case study. A multiple case study will enable the researcher to examine and analyze the problem within each setting and across settings (Baxter & Jack, 2008). Therefore, a multiple case study strategy will give us the ability to evaluate how similarly or differently innovative companies design and use their respective budgets. The use of multiple case study strategy requires a selection of two or more cases that are believed to be comparable (Rowley, 2003). We made a careful selection of cases that are comparable and have innovation as a common characteristic, in order to effectively address how their budgetary design is implemented smoothly. Yin (2009) recognized the relevance of using a multiple case rather than a single case and further added that; even if only two cases are used in a research, the chances of making a good study is greater than a single case strategy. Moreover, this choice for multiple case strategy was made because the evidence generated from a multiple case is often considered more compelling, thus the overall research is always regarded as being more robust (Yin, 2009).

Ryan, Scapens and Theobald (2002) made a distinction between the types of accounting case study. These authors argued that accounting case study can be classified into; Descriptive, Experimental, Exploratory and Explanatory. From these four different categories, we classify this research paper as an exploratory case study. According to Ryan et al. (2003), an exploratory case study can be used when the researchers want to examine or investigate the reasons for a particular practice in an organization. This paper will therefore aim to explore how innovative companies design and use their budgets and as well the reasons why they are practicing it the way it is. Further, Baxter and Jack (2008) argued that an exploratory case study can be adopted when the researcher wants to explore situations in which the phenomenon being evaluated has no single set of outcome. As can be noted from budgeting literature, there is no single way of designing and using budgets. A budget can be designed differently and can serve different functions or purposes in organizations. Therefore, the phenomenon being studied in this research paper has no single set of outcomes.

2.2 Selection of companies

This paper requires a thorough evaluation and selection of companies because it is not every company that fits the purpose of the research. To effectively accomplish the purpose of the research problem, data from non-innovative companies might not be useful for analysis and discussion of the paper. For this reason, we set a criterion that a company has to meet before being selected and contacted. This criterion is regarding innovation. A company has to

be innovative in its process or product development before we consider it as a candidate for our data collection source.

Companies were selected from two online databases; the first database provides a list of all companies in Lund whereas the second database gives a list of all companies in Malmo. Considering the short duration in which this paper has to be written and completed, we deem it necessary to contact companies that are close to our geographical location. These two databases provided us with a significant number of potential candidates.

After collecting the list of all companies in both Lund and Malmo, it was quite obvious to us that an evaluation and shortlisting has to be made in order to select the right candidates. Edmonson and Mcmanus (2007) recognized the importance of finding and selecting the right sites for collecting data as a key element of research project. Similarly, Yin (2009) acknowledged the screening of potential candidates as an important preparation that researchers have to undertake before collecting data for case study. Therefore, we choose one company at a time and briefly review the company's official website to have an overview of the company's operations and activities. If a company is found to stress innovation or research and development as a significant part of its strategy, then a detailed review of the website is done. This detailed review is done to gather broader knowledge about the company and if possible to access the name and contact of the CFO of the company. The CFOs are the targeted representatives of each company because they are always involved in the planning and budgeting process of their companies (Kaplan and Norton, 2005). Since the focus of this research is to examine how the companies design and use budgets, and not exclusively to evaluate whether the budget hinders innovation, we expect the CFOs to provide us a broader knowledge about their budgetary design and use.

Further, thirty (30) companies from the overall list were shortlisted and contacted. Some of the companies are located in Lund and the others in Malmo. Each of these companies was first contacted by email through the company's CFO, whose contact information was obtained from the company's website. For the companies that do not publish information about their CFOs, we sent the email to the companies' official email addresses; however, in this mail we stressed that, the receiver should forward the mail to person responsible for budget preparation in their company. After some days, phone calls were made to the companies to follow up the sent mails. Some companies responded positively while some others responded negatively and some companies completely fail to respond. Majority of the responded companies (both positive and negative) showed interest in our research problem. However not all of these companies could provide time for an interview with us in April or May, some of the CFOs claimed to be busy with other organizational activities at that time.

Out of the thirty (30) contacted companies, four (4) companies were finally interviewed. However, only three (3) of the interviewed companies will be described and used for the analysis and discussion of this paper. For the fourth company, we realized after the interview that the company is not innovative, although a reviewed of the company's website was done before the selection. The information published on that company's website is rather misleading. This company is a contract developer and manufacturer of product; however, it is

not innovative in its process or products. Instead the company follows strict contract agreements with its contractors and makes no changes or improvement during the development and manufacturing process. For this reason, we exclude the data from this company to suit the purpose of the research. From this point, further discussion will be based on the three companies.

2.3 Data Collection

Data collection for a high-quality case study requires certain preparation. According to Yin (2003), preparing for data collection can be difficult and complex, and if not properly done, it will jeopardize the entire case study investigation. In line with Yin (2009) suggested preparation criteria for doing a case study and collecting data, we possess prior skills in case study research and data collection. Our skills, which include asking good questions, listening attentively etc., are obtained from and developed through the previous case studies we had during our study period. In addition to our prior skills, we had a screening of potential candidates, which was done through reviewing the targeted companies' websites (as mentioned above). The goal of screening is to be sure that that cases or companies are properly identified before the formal data collection (Yin, 2003). Also, we read relevant studies about budgets, management control systems and innovations to have an overview of research topic and formulate the questions for semi-structured interviews.

Further, this research is conducted by means of multiple sources of evidence. Using different sources of evidence strengthen the case study data collection. According to Yin (2003), the use of multiple sources of evidence in a case study allows the researcher to address a broader range of historical, attitudinal, and behavioral issues. When using multiple sources, each of these different sources requires different approaches to their interrogation and each is likely to generate different kinds of insights. Moreover, each source has its strengths and weakness, so the richness of a case study is yielded by using different sources of evidence (Rowley, 2002). Thus, the findings or conclusion obtained from a case study with several sources of evidence are likely to be much more convincing and accurate (Yin, 2003).

The data collection for this paper is categorized in accordance with Hox and Boeiji (2005) categories of data collection; the primary data collection and the secondary data collection. Each of these is discussed in the following sub-sections.

2.3.1 Primary data

Primary data are data that are mainly collected for the specific research problem, using procedures that best fit the problem at hand (Hox & Boeiji, 2005). The main procedure used in collecting the primary data for this research was done through interviews. According to Yin (2003), interview is the most important and essential source of case study research. The use of interviews helps researchers to gather valid and reliable data that are objective and relevant to their research question (Saunders et al., 2009). In addition, interviews aid researchers to address the "Why" questions in an actual conversation rather than just posing the "how" questions (Yin, 2003). Interviews will allow the researcher to know not only "how" something is done, but also "why" a particular process or activity occurred as it did.

Based on the classifications of the different types of interviews by Flick, (2009), we adopted a semi-structured (in-depth) interview. With this type of interview, the interviewees' viewpoints are more likely to be expressed in an open situation than in a structured interview or a questionnaire (Flick, 2009). This type of interview allowed us to ask the respondents about the facts of the matter and as well their own opinion about how things are done in their respective organizations in relation to our research topic (Yin, 2009). Saunders et al. (2009) argued that, in semi-structured interviews, the researchers will have a list of themes and questions to be covered, although the questions may vary from interview to interview. In line with Saunders et al. (2009) argument, we prepared a list of questions (see appendix 1) to serve as a guide for the interviews. Some questions were omitted in particular interviews and some were added, given a specific organizational context that is encountered in relation to our research topic.

As stated in the selection of companies part, the empirical data from three companies are used in this paper. Each company's Chief Financial Officer (CFO) was contacted and questions were sent prior to the interview date. For each company, a face-to-face interview was undertaken at their respective company premises. In addition to the face-to-face interviews, CFOs were later contacted by phone for additional information and clarification of some misunderstood arguments. Table 1, gives a list of the companies with contacted persons and other relevant information.

Table 1 List of interviewed companies

Name of the company	Contacted person	Position of the interviewee	Date of interview	Duration of the interview
Probi AB	Niklas Brandt	Chief Financial Officer	2015-04-10	1hr 15 min
Active Biotech	Hans Kolam	Chief Financial Officer	2015-04-14	1hr 45 min
Cellavision	Magnus Blixt	Chief Financial Officer	2015-04-22	1hr

As can be observed in Table 1, the interviews were conducted on different dates depending on which date and time the CFO allocate for us. It can also be noticed that the duration of interviews differs between companies. Active Biotech has the longest duration because it uses rolling forecast rather than the traditional budget; therefore it takes more time for the interviewee to effectively explain the differences between the two and their reason for using one over the other.

Before the commencement of every interview, the interviewees were asked if we can record the conversation. This request was approved by all the interviewees; therefore, we recorded all the interviews in order to improve the trustworthiness of the paper. Moreover, by recording an interview, this will allow us (the participants) to concentrate fully and listen attentively to what is being said by the interviewee. It also allows the participants to observe

the expression and other non-verbal cues given by the interviewee when responding to the questions (Saunders et al., 2009).

Furthermore, both of us (the authors) were present in all the interviews, in order to obtain credible and reliable information from the interviewee and as well to have a more interactive discussion which allows both participants to effectively participate during the period.

2.3.2 Secondary data

The secondary data used in this research was collected from published records and documents. We accessed the official website of every company to gather information relevant for the purpose of the research. Furthermore, several documents such as companies' annual reports and other reports, as well as articles published by companies were reviewed, to obtain more useful information regarding the companies and their innovations.

In addition, several useful literatures ranging from textbooks to journal articles were reviewed. The text books about budgeting, innovation, and cost and management accounting were accessed at Lund University Libraries, whereas the journal articles were gathered from both LUBsearch and Google Scholar. The literature reviewed in this paper was selected based on its importance in relation to the research problem, as well as its applicability in the discussion of the part, and also on the reliability of publisher.

2.4 Design of interview guide

It is important at this point for us to once again stress that, these questions are not structured and they are as well not strictly followed in each interview. The questions are rather developed to serve as a mechanism that will help us to devise our intellectual skills that will be needed to make on-the-spot decision regarding further questions to be asked. The questions were also used to guide our conversation during the interview process. Appendix 1 presents the list of questions. As can be seen from the Appendix, the questions are divided into four parts.

The first part of the questions serves as an introduction for the interview and is aimed to briefly investigate the overall company and its activities and operations. The answers for these questions will provide us with facts about the company, including the industry in which the company operates, the size of the company, its business cycle and strategy. In summary, this part will give an overview of the company to be interviewed.

The second part of the questions was concerned with the budget for the overall company. These questions were formulated to enable us to obtain answers regarding the form of budget or forecast that the company uses. It also deals with the design, the approaches as well as the functions that the budget or forecast serves in each company.

The third part of the questions deals with innovation in the company. In this section we aim to know how innovative is the company and how often does the company produce new products or services. We also want to know the innovation strategy of the company and the role that the budget serves in each innovation strategy.

The final part of the questions deals with the budgeting process for R&D activities. These questions were aimed to obtain information regarding how the companies design and use their budgets specifically for R&D activities.

2.5 Literature Review

For every research work, it is relevant to make a critical review of existing literature in the area of the research problem. A critical literature review is the process of reviewing the work of prior researches which can be found in textbooks or journal articles and it provides a foundation on which the research is built (Saunders et al., 2009). Two approaches are identified by Sanders et al. (2009) and Yin (2003); the deductive approach and the inductive approach.

Based on the two classifications, we used an inductive approach in conducting the literature review for this thesis. With an inductive approach, the researchers begin with data collection and then explore the data to identify which themes or issues to follow up and concentrate on (Saunders et al., 2009). In this thesis, although a brief literature review of the overall topic (budget and innovation) was done before collecting data, we developed the literature review section after collecting data from the three companies. The brief review was just to give an overview of the research problem and to guide us in data collection; nevertheless, the literature was completely developed after the data collection process. Saunders et al. (2009) argued that, with this approach the researchers will already have a clearly defined purpose with research questions and objective; the only difference with the other approach is that, the researcher in this case will not start with a predetermined theories or conceptual framework but rather with data collection. The main advantage of using this approach is that, it allows the researcher to concentrate only on reviewing the relevant and significant literature for the problem at hand (Saunders et al., 2009). Therefore, all the literatures reviewed in this paper are relevant for the research problem and will be applied in the analysis and discussion of the thesis.

2.6 Data Analysis

The analysis and discussion of this research will be carried out in accordance with two of the recommended analytic techniques by Yin (2009). This author outlined five analytic techniques, pattern matching, explanation building, time-series analysis, logic models and cross-case synthesis, which can be used when analyzing data for case study research. The analysis for this thesis will incorporate both cross-case synthesis and pattern matching.

The use of cross-case synthesis will allow the researchers to create tables that will display the data from individual cases in a uniform manner (Yin, 2009). In the analysis and discussion section of this research, we will create a table that will capture the findings from each case which can be compared to identify similarities and differences between the cases. According to Yin (2009), the importance of conducting a cross-case synthesis is that, the examination of tables for cross-case patterns will be strongly based on argumentative interpretation and not numeric tallies. Therefore, the analysis of this research paper will rely on interpretive arguments rather than numeric totals.

Furthermore, by using pattern matching, this will allow the researchers to compare the empirically based pattern with an anticipated one (Yin 2009). In this thesis, the pattern matching technique will enable us to effectively compare theory with practice. Moreover, combining the two techniques will give a thorough analysis and discussion of our research because it will allow us to identify similarities and differences between cases and also compare practice with theory.

2.7 Limitations of research method

Despite the above mentioned strengths of our research method and the motivations for choosing a case study research, this paper will acknowledge the limitations of using a case study method.

The main limitation of using a case study research design is its inability to scientifically generalize findings. Yin (2009); Otley and Berry (1994) and Saunders et al. (2009) criticize the method for providing little or no basis for scientific generalization. The findings and conclusion based on a case study research may therefore be not applicable to other research settings such as other organizations. This limitation is always a concern if the researchers used a single case or a small number of cases (Saunders et al., 2009). Since this thesis used only three cases, which we considered as a small number of cases, we will recognize that the conclusions from this paper may not be the case for other organizations. However, the focus of the thesis is not to produce a theory that is statistically generalizable to all populations but rather, it is to evaluate what is going on in each analyzed organization in line with the research problem. Thus the research will expand the theories in this area of research.

Another criticism of this method is with regards to the bulky documentation of the findings. Yin (2009) argued that case studies are considered to take too long and results in massive and unreadable documents. However this argument would not be a big issue for this paper because we strive to make this thesis a concise, precise and clear throughout the paper.

2.8 Validity and Reliability

Several researchers including Yin (2009); Ryan et al. (2002); Rowley (2003) and Saunders et al. (2009) acknowledge the relevance of obtaining a highest possible reliability and validity in a research paper. Yin (2009) identified four tests; construct validity, internal validity, external validity and reliability, which can be used to establish the quality of empirical social research. Since case study, according to Yin (2009), is a form of social research, these tests are considered in this thesis.

Firstly, we used multiple sources of evidence in this research paper. Using multiple sources of evidence increases the trustworthiness and credibility of a research (Yin, 2009). In this thesis, the CFOs of all the companies were interviewed to obtain information regarding how their companies design and use budgets without hindering their innovation. The companies' official websites were also reviewed to gain additional evidence for the research problem at hand. Further, articles published by the companies were also taken into consideration to compare with the evidence generated from the interview and identify additional data. This

research paper is therefore not relying only on a single source of evidence but rather on several sources to establish a high credibility and validity of the research.

Secondly, this paper uses multiple cases rather than single case. Multiple case study strategy is preferable to a single case (Yin, 2009; Saunders et al., 2009, Baxter & Jack, 2008) because it provide the researcher the ability to examine and understand the similarities and differences between the studied cases. Overall, using multiple cases makes the findings or results more robust and reliable (Baxter & Jack, 2008). As previously stated and can be seen throughout the paper, we used three cases to establish a reliable analysis and conclusion of this research paper.

Thirdly, the reliability of a research is described by Yin (2009) as the possibility of a later researcher, who follows the same procedure, to obtain the same findings and conclusions. In this thesis, we endeavor to explain in detail all the procedures that were undertaken so that if any later researcher wishes to carry out the same research will generate the same findings.

Finally, the CFOs were later contacted by phone for further clarification on certain issues. This was done to avoid our subjective interpretation, thus reduce interpretation biases and maintain a high quality thesis. We also recorded all the interviews to obtain a permanent record of our interview data, which we can listen to, and make necessary adjustments, at any time during the course of writing this paper. Saunders et al. (2009) argued that, recording interview data is one of the means of controlling bias and producing reliable data for analysis.

3. Theoretical Review

This section presents the reviewed literature for this thesis. The section is divided into three sub-sections; budget, innovation and organizational lifecycle, to clearly capture all the relevant literature for the research problem at hand. Each sub-section is separately evaluated below and addresses useful information for the analysis and discussion of this research paper. Particularly, the budget sub-section will be used for analyzing the first research question regarding how innovative companies design and use budgets. The second research question will be analyzed with the help of organizational life cycle theory and Davila's framework of management control systems design for innovation.

3.1 Budget

In this sub-section, budget as a management control system is presented. Further the functions of budget and the choices that are available for companies when designing and using their budgets are discussed in this sub-section.

3.1.1 Budget as a management control system

Budget is an essential management control system (MCS) for effective and efficient short-term planning and control in every organization (Anthony & Govindarajan, 2007). Budget is regarded as essential to, and the foundation of MCS in numerous organizations (Bunce et al., 1995). Horngren et al. (2002) defined budget as a management's quantitative expression of an expected plan for a specified period and as an aid to coordinate and implement what is needed to be done to achieve the plan. The budget is used to translate the long-term strategies of an organization into short-term action plans, usually in one year (Anthony & Govindarajan 2007). Hansen et al., (2003) argued that, budgeting system have the ability to weave together all the disparate threads of a firm into a comprehensive plan that serves many different purposes in an organization. Further, budgetary system is the process that brings together the goals, plans and responsibilities of a company and at the same time helps the company to achieve financial coherence (Bunce et al., 1995).

The budget of a company may have many uses such as resource allocation decision and integration of processes; however, Malmi and Brown (2008) stressed that the focus of budgeting, as a control mechanism, is on planning acceptable levels of behavior and evaluating performance against those plans. Moreover, a budget can contain both financial and non-financial, such as operating, aspects of a company's plan. The operating component focuses on acquisition and use of scarce resources while the financial aspect focuses on how to obtain the funds to acquire needed resources (Horngren et al. 2002).

Further, budget is described by Malmi and Brown (2008) as one of the components of the cybernetic controls in the Management Control System (MCS) package. As a basic cybernetic control, budgeting is associated with setting standards of performance, measuring performance, comparing the performance with standards and providing information concerning unwanted variances. Malmi and Brown (2008) argued that, cybernetic system, such as budget, can either be an information system or a control system depending on how it

is used by the firm. The system is considered as an information and decision support, if the managers detect unwanted variances and modify the activity that leads to the variance without the involvement of other employees. However, it is considered as a control system if targets are linked to behavior, and variations in performances are accounted for.

Similarly, Cardos et al. (2014) stressed that budgetary control allows management to compare and analyze the difference between budget and actual figures. These analyses help management to understand the current situation of the company and also to decide on what to do in the future, whether to keep the current direction or try to change the course. Budgets can also be used to support performance management. If the budget is well prepared, it gives management detailed information regarding the next fiscal year; therefore, managers can have the ability to set easier, realistic and attainable objectives (Cardos et al., 2014).

3.1.2 Functions of budgets

A budget serves several useful functions in organizations. The main functions that budget plays in companies include planning, communication, control and coordination. These are not the only functions of budget; however, for the purpose of this research we will only focus on these four functions. Each function is separately discussed below.

Planning

Budget plays a crucial role in planning the activities of an organization (Hansen, Mowen & Guan, 2007). It provides detail information regarding what management wish to achieve and how. Therefore, it serves as a plan of action for a company and allows management to identify and determine in advance the amounts and time required to achieve its desired goals. Churchill (1984) stressed that budget, from a planning point of view, harmonizes the company's strategy with its organizational structure, its management and personnel, and the tasks that have to be done to implement the strategy. If the budget is well prepared and implemented, it will translate the company's strategic plans into period-oriented operational goals.

According to Barrett and Fraser (1977), the value of budget in the planning process of a company comes from the fact that budgeting forces management to make detail evaluation on both the general economic situation of which the company is operating and the economic interrelationships among all the company's various activities. Without the budgeting process, the pressures of the daily operating problems may tempt managers not to plan for future operation (Drury, 2008).

Control

During the preparation process and at the beginning of the year, the budget is a planning tool. At the end of the period, it is a control tool (Shim & Siegel, 2008). In this sense, budget is considered as a type of "yardstick" against which the actual performance is evaluated. It is used as a formal mechanism to monitor the progress of organization towards its goals. The objective of budget as a control system is to minimize the difference between actual and desired conditions (Hanson, 1966). The controlling function of budgets is performed by

comparing actual revenue and costs with budgeted ones to identify occurred variances and determine necessary corrective actions (Anthony & Govindarajan, 2007). Variances are analyzed with the purpose to identify the causes and parties responsible, thereafter the responsive actions are taken to correct them if needed.

Communication

Budget serves as a management control tool that promotes the communication of plans and targets in an organization (Upchurch, 2002). The plans and targets are communicated among subunits and between managers and subordinates within the company. A good budget process communicates not only from a top-down but also from a bottom-up perspective (Horngren, Sundem & Stratton, 2002). Further, the plans of management cannot be successfully implemented unless the organization understands these plans, and budget is a useful device for communicating information regarding the plans. According to Drury (2008), it is through the budgeting process that top management communicates their expectations to the middle and lower level management, in order to facilitate better understanding and allow managers to coordinate their activities to achieve these expectations. When top management defined the goals of the organization, these are communicated to other employees through the budget, and the employees and lower-level managers in turn communicate to the top-level management how they plan to achieve the goals and objectives (Horngren et al., 2002).

Coordination

Budgets also serve a coordination role. Since the budgets consist of many subsidiary budgets for different functions of the company on different levels, some inconsistencies may appear when assembling the pieces into an overall budget. During the budget preparation, these incompatibilities are discovered and resolved (Anthony & Govindarajan, 2007). Thereby, budgets help coordinate the activities in the entire organization with the purpose of assuring that the resources are not under- or overused. At a higher level, budgeting coordinate operational plans with investments plans and finance (Arwidi & Samuelson, 1993). Moreover, budgets can serve a coordinating function after the budget period has actually started. If a unit does not meet its budget due to changed conditions, then the knowledge gained during the budget preparation about interrelations between different activities can be beneficent in developing revised plans and reallocation of resources (Barrett & Fraser, 1977).

3.1.3 Budget Choices

There are different choices or alternatives that can be used when designing and using a budget in a company. These choices are discussed and presented below.

3.1.3.1 Budgeting alternatives

Traditional annual budgeting has been highly criticized by researchers and practitioners (Wallander, 1999; Hope & Fraser, 2003), who develop new approaches to improve the budgeting process or suggest abandoning it (Hansen et al, 2003). To overcome budgeting problems, a budget can be designed in different ways depending on the purposes that the

budget is supposed to serve and the functions that are supposed to be improved (Hansen, 2011).

Primarily, companies differently call their budgetary systems; some companies use “budget” as the characterization for the system, whereas others avoid the name “budget”. However, the rhetoric differences between them do not necessarily reflect the differences in perceived functions and uses (Arwidi & Jonsson, 2010). Some companies replace traditional budgets by forecasting systems resembling characteristics of budgeting to a large extent. Thus, Hansen (2011) considers rolling forecasts as a budgeting alternative distinct from beyond budgeting and traditional annual budgeting. The similar approach is taken by Arwidi and Jonsson (2010).

According to Anthony and Govindarajan (2007), a forecast differs from a traditional annual budget in that it merely provides the most realistic picture of the future with no commitment to make a forecasted outcome happen. A budget, in contrast, is a management plan with the implication that positive steps will be taken to make actual outcome correspond to the plan. The main distinctive features of forecast are following:

- it can be prepared for any time period
- it is not approved by higher authority
- no responsibility to meet the forecasted outcome
- it is updated as new information arises
- variances from actual results are not analyzed formally

Static forecasts as well as budgets run the periods down to zero and then start again. In contrast, with a rolling forecast, the number of periods in the forecast remains constant in the result of adding one period to a traditional forecast and dropping one period of actuals. Thus, a rolling forecast maintains a constant forward-looking time horizon (Hansen, 2011). The opponents of traditional annual budgeting claim that rolling forecasts must replace the traditional annual budget (Hope & Fraser, 2003). Rolling forecasts involve more frequent forecasting over short periods and thereby reduce the time gap between business reality and planning. According to De Leon et al. (2012), this forecasting requires to review business operations more frequently and strategically and explore the hypothesis space in order to generate forecasts and thereby helping learn about the changes of environment. Therefore, rolling forecasts are argued to minimize many of the problems of traditional annual budgets by providing a mechanism for learners to explore how the environment affects goal achievement, facilitating organizational learning and innovation, and making organizations more competitive and responsive to change (Haka & Krishnan, 2005).

3.1.3.2 Budget design choices

A budget can be designed and used in different ways that largely determine the effectiveness of budgeting (Churchill, 1984). There are several important issues to be settled when preparing a budget

One of the first questions to be answered is the extent to which budget setting process involves all management levels. There are three approaches in this respect: top-down, bottom-up and top-down/bottom-up. The top-down approach allows top managers to bring forward their views on the company's strategies and goals. The bottom-up approach takes advantage of the operating managers' knowledge of the environment. The more responsibility they have for innovation, the more their involvement is needed in budget preparation (Churchill, 1984). On the one hand, participation of lower level managers in the budgeting process reduces information asymmetry in the organization, and on the other hand it provides greater commitment of these managers to the budget (Chong et al, 2005). A top-down/bottom-up approach combines the two mentioned approaches and enables collaboration between top and lower management (Rasmussen et al, 2003).

Further, a budget can remain static or be revised during the course of the budgeted period as conditions change. The absence of timeliness and relevance are the most frequently cited weaknesses of traditional budgeting. Accordingly, the frequency of budget revisions and the timeliness of the information used in those revisions affect the relevance of budgeting (Yahya-Zadeh, 2012). However, budget revision is a controversial issue; though revised budgets are more accurate for planning purposes, they are less appropriate for motivation and performance evaluation purposes due to frequently changing estimates and goals (Churchill, 1984).

Moreover, top management can set budget targets of different difficulty. On the one hand, the firm might establish a very difficult target that can be achieved only with high effort and good economic conditions. On the other hand, a firm might set a very easy target, with considerable slack (Arnold & Artz, 2015). Difficulty of budget targets is important from behavioral perspective since targets influence the motivation and performance of employees. Also difficulty of budget targets as tools in planning, coordination, and resource allocation, is essential for decision-making since a very difficult target can induce more negative deviations and consequently higher costs for decision-making (Arnold & Artz, 2015).

Furthermore, top management should decide whether to evaluate performance of department managers on the basis of corporate profit or departmental results against budgeted estimates. Corporate profit is used to evaluate the overall performance of the company, therefore its use for the evaluation of department managers instead of department results against budget can reinforce the importance of corporate profit and reduce dysfunctional effects of budget (Churchill, 1984).

An additional choice that organizations have to make when using their budget is either to use it as a tight or loose control. Tight budgetary control can be defined with the help of specific attributes (Van der Stede, 2001). Firstly, tight budgetary control is characterized by high emphasis on meeting the budget on a short-term basis. Another budgeting attribute is a detailed interest in specific budget line-items. In contrast, if top management is interested only in aggregated results and does not require much detail, lower level managers have more discretion for reallocation of resources between line-items within the budget (Van der Stede, 2001). Furthermore, tight budgetary control is intolerant for budget deviations which

immediately trigger corrective actions and interventions. When budgetary control is loose on the other hand, top managers are more tolerant and do not systematically scrutinize deviations providing more discretion to decide about necessity of corrective actions to lower level managers (Van der Stede, 2001). Moreover, tight budgetary control is characterized by intensive budget-related communication, and budgets are subject to regular discussions between top and lower level managers. This budgeting attribute is related to Simons' (1995) interactive control concept, which is consistent with budgetary tightness according to the research of Van der Stede (2001).

3.1.3.4 Diagnostic and interactive uses of controls

One of the underlying ideas of Simons' levers of control framework (1995) emphasizes the tensions between the organizational need for the achievement of predefined objectives and the organizational need for innovation. In relation to these tensions, Simons points out the relevance of the style of use of control systems. According to Simons (2005), there are two different styles of use of formal Management Control Systems (MCS): interactive and diagnostic. The diagnostic use is performed on an exception basis to monitor and reward achievement of pre-established goals, whereas the interactive use aims on expanding opportunity-seeking and learning, thereby fostering successful innovation (Simons, 2005). Any control system can be used interactively if the information provided by the system is consistently important agenda for top-management and operating managers at all levels of the organization, if this information is discussed in meetings and the focus of these discussions is the debate and challenge of data and action plans (Simons, 2005). Moreover, Tessier and Otley (2012) develop the interactive concept and divide it into two notions: intensive use of control system which facilitates communication and promotes learning, and strategic validity control, which monitors whether the organization has the right strategy in place.

The majority of management accounting research has assumed that budgets serve the traditional role of evaluating performance what can be referred to as a diagnostic role (Abernethy & Brownell, 1999). In this traditional view, the budgeting system has the features that Simons (2005) attributes to diagnostic control system: the ability to measure outputs, the existence of standards against which the outcomes are compared, and ability to correct the deviations.

However, budgets can also serve as dialogue and learning mechanism, what Simons classified as an interactive role. An important characteristic of interactive use of budgets is the continual exchange of information between and within various levels of an organization (Abernethy and Brownell, 1999). This exchange of information takes place not only in the budget setting process, but also involves an ongoing dialogue between subordinates and superiors as to why variances occur and whether any responsive action should be taken. In this sense, the budgeting system provides a database which fosters interaction and learning (Abernethy and Brownell, 1999). Thus, interactive use of budgeting system enables the top management to communicate their values and goals and also facilitates the exchange of information about opportunities, threats, strengths and weaknesses of the organization. Moreover, the budgeting system can become a means of debating how to react to changes in

operating conditions and learning more about the alternative responses (Abernethy & Brownell, 1999). In addition, the interactive dialogue and debates can create an environment that encourages team members to discuss and challenge budget related data, assumptions, and therefore are associated with increases in team effectiveness and team motivation, that is important in innovation environment (Chong & Mahama, 2014).

Furthermore, Bisbe and Otley (2004) examined the interrelations between product innovation, organizational performance and the interactive use of control systems, including budgeting system. Their findings corroborate the idea that a positive impact of product innovation on the financial performance of the organizations depends on the style of design and use of budgeting system. Thus, interactive use of formal MCS contributes to reducing the risk of excessive and inadequate innovation in high-innovating firms, and contributes to reducing the risk of too little innovation in low-innovating firms, thereby having a moderating effect on the impact of innovation on performance (Bisbe and Otley, 2004). Similarly, Dunk (2011) finds that the use of budgeting systems as a planning mechanism, consistent with the Simons (2005) interactive approach impacts positively on the relation between product innovation and financial performance of firms.

3.2 Innovation

In this sub-section, the focus of the paper is shifted to innovation. It addresses the definition and importance of innovation for companies, the process of innovation and the different strategies for innovation. The sub-section further evaluates innovation project management.

3.2.1 Definition and importance of innovations

Innovation is a process of commercial exploitation and application of ideas and inventions and can take the forms of new products, services and methods (Smith, 2010). The ability of firms to innovate is frequently considered to facilitate firms gaining competitive advantage and enhancing financial performance (Dunk, 2011). Therefore, in today's world of globalization and increasing competition, innovations become vitally important for survival of large as well as small and medium companies and constitute an essential part of their business strategies (Rosenbusch et al., 2011).

An additional point is that innovation can be described as unpredictable, risky and highly uncertain in regard to development process and market response (Christiansen, 2000). New ideas may not come when are required, development may be slowed by problems, it may be difficult to find funds or the people needed for innovation (Christiansen, 2000). In view of mentioned above risks, to choose a successful innovation strategy and an optimal amount of innovation is of great importance for managers (Davila et al., 2012). The innovation strategy should match the strategic objectives of the company. An organization with a leading position in a mature market can decide that its innovation strategy is more defensive and focus on protecting and managing for margin, whereas a company operating in a more dynamic competitive market can focus on significant opportunities of innovation for growth (Davila et al., 2012).

3.2.2 Innovation process

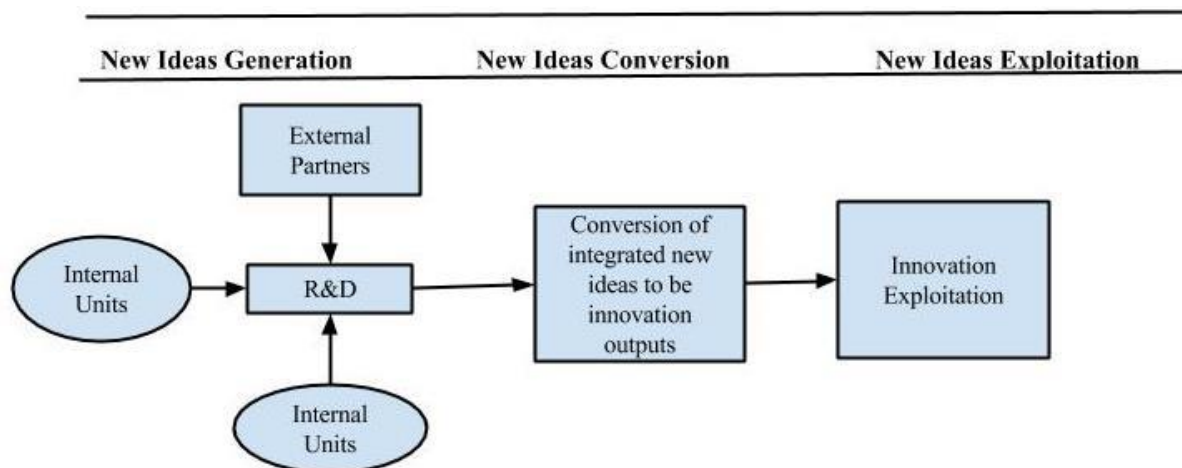
Innovation process is described by Penide et al., (2013) as a linear process that starts with idea generation and finishes with product launching. The process is concerned with all the activities needed to turn an idea into commercial product or services (Smith, 2010). These activities are analyzed and categorized into three major steps (Roper, Du and Love 2008; Hartono 2015).

The first step is concerned with the idea generation or knowledge sourcing of the company. News ideas can be obtained from internal (employees of the company) as well as external sources. However, when ideas are acquired from external sources, they are integrated with the existing knowledge to be strategic value for the company (Lichtenthaler, 2011).

The second step involves the integration and conversion of the new ideas into the innovation output. To effectively integrate the generated knowledge from both internal and external sources into the innovation process, the company should choose an appropriate mechanism for integration and also create an effective governance mechanism (Wallin and Krogh, 2010).

The final stage of the process deals with the exploitation of the ideas that generates value for the company. At this point, the company commercializes its ideas and knowledge either exclusively or using it internally through out-licensing or alliance (Hartono, 2015). Figure 1, depicts the three stages discussed above:

Figure 1 New Ideas and Capacity-Based framework for Innovation Process



Source: Hartono, 2015, p. 167

3.2.2 Different innovative strategies

Davila (2005) classifies four different processes that capture the effect of different types of innovation on strategic change. The author described the four types of innovation along two dimensions. The first dimension explains the locus of innovation that is, where innovation

happens in the organization, whether at the top management level or throughout the organization. The other dimension explains the type of innovation, whether it is an incremental or radical innovation. Incremental innovation modifies the strategy but keeps the firm within its current strategy trajectory while radical innovation redefines the future strategy of the firm. Table 2 shows the four types along the dimensions.

Table 2 Strategic concept for management control system

	Types of innovation defining strategic change	
	Incremental	Radical
Locus of innovation		
Top management formulation	Deliberate strategy	Strategic innovation
Day-to-day actions	Emergent strategy/intended strategic actions	Emergent strategy/autonomous strategic actions

Source; Davila, 2005, p. 42

With incremental innovation, the organization can easily identify its effects since its build upon competencies already exist in the organization. It also involves lower risks and lower expected returns. Incremental innovation consists of deliberate strategy when the innovation happens at top management, and intended strategic action when the innovation happens through the day-to-day activities of the company. With the deliberate strategy, only top level managers are innovative (formulate new strategies) while middle and lower level managers focus on implementing the strategy. Budget as a formal management control system plays an important role in this innovation strategy. The budget supports the translation of the company's strategy into action plans, monitor the execution of the plan and also help to identify deviations for corrective measures (Davila, 2005). However, with the intended strategic actions, top managers do not formulate a deliberate strategy; instead the strategies are formulated as of results of the daily activities of the organization. In this case, top managers only focus on defining guidelines that shape the strategy. Therefore the role of budget as a management control system is to provide a framework for innovation and capture the learning that happens in the organization (Davila, 2005).

In contrast to the incremental innovation, radical innovation is high-risk and entails high expected return. This type of innovation usually upsets organizations and changes dramatically its industry structure. With this type of innovation, budget as a formal management control system plays a minimal role compared to incremental innovation. Resource allocation process in the two types of innovation differs because of the higher risk and longer time horizons in radical innovation (Davila, 2005). In radical innovation, specific resources that are required by the experts are allocated for exploitation. According to Davila (2005), informal controls are the most important, in this type of innovation, to encourage experimentation and discovery. Further, radical innovation entails strategic innovation when the innovation radically modifies the strategy and happens at top management level; and autonomous strategic action when the innovations emerge throughout the organization.

3.2.3 Innovation Project management

A project is a one-off activity which has a specific objective and time frame. The development of new products is typically a one-off activity, therefore innovations are conducted in projects and consequently project management is considered important for innovations (Smith, 2010). Innovation projects are temporary structures established to bring novel ideas into their completion and introduction as marketable new practices, services and products (Sivabalan & Bisbe, 2013). Specific attributes of project management in general are also relevant in innovation-oriented projects. Project management is a planning and control method that is used to ensure that projects are properly executed within budget and on time. Thus, budget, duration and quality of works are the main project limitations (Lendyuk & Rippa, 2009).

The project budget is an important link between planning and control of project (Anthony & Govindarajan, 2007). It represents the management's estimates of the project cost and also commitment to execute the project at that cost. Since the projects are less standardized and can be lengthy, cost estimates for projects tend to be less accurate. Therefore, evaluation of project performance based on project budget is complicated by the need to analyze both budget and actual results (Anthony & Govindarajan, 2007).

Time is another project limitation, and in today's world of globalization and high competition the pressure of time is increasing and becoming more important in innovation projects to obtain competitive priorities such as on-time delivery (Sivabalan & Bisbe, 2013). However, attaining simultaneously time and cost targets might be extremely difficult, because they are in a tradeoff relationship, so the costs grow when the project execution time is reduced to a very low limit and the execution costs fall when the time is longer. Therefore, it is needed to choose an optimal balance between them or prioritize the main limitation (Lendyuk & Rippa, 2009).

So, greater resources can be allocated to accelerate the execution of the project if the time is the major limitation, alternatively the project duration can be prolonged to reduce the costs if the budget is the main limitation (Lendyuk & Rippa, 2009).

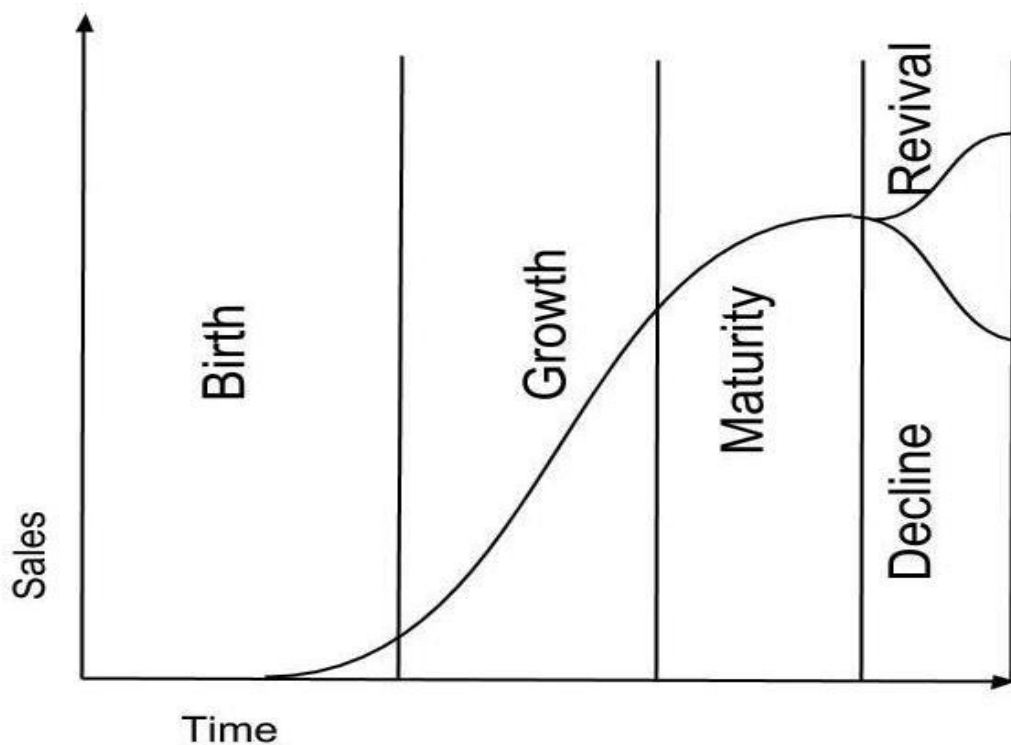
In addition to these project limitations, innovation-oriented projects are highly prone to uncertainty, since each project implies information gaps related to market and technology uncertainty, as well as uncertainty around the project scope, costs and time (Davila, 2000). Project uncertainty is relevant to explain the design and use management control systems (Davila, 2000).

3.3 Organizational life cycle

Organizational life cycle theory is argued to be applicable for management accounting research and provide patterns of multiple contingency factors and internal characteristics (Moores & Yuen, 2001). The theory reflects the various stages of the development of organizations with each stage manifesting integral complementarities among multiple contingent variables: organizational situation, strategy, structure and decision making

methods (Su et al., 2014). These stages include the birth, growth, maturity, revival and decline stages (Miller & Friesen, 1984). Figure 2 depicts organization life cycles.

Figure 2 Organizational Life Cycles



Adopted from Malik & Hine, 2011, p. 25

The birth stage is the period in which a company is attempting and struggling to become a viable entity (Miller & Friesen, 1984). In the birth stage organizations focus on their development and early commercialization of their products; the structure is described as simple; the strategy prevails with a narrow product scope (Su et al., 2014).

The growth stage is the period in which the firm is expected to establish its distinctive competencies and experienced some initial product-market success (Miller & Friesen, 1984). Organizations in the growth stage seek to develop more formal structures; greater effort is devoted to coping with high level of uncertainty; the main strategies pursued are early diversification and innovation (Moore & Yuen, 2001).

In the maturity stage the environment is relatively stable, exhibiting a lower level of uncertainty; the organizations emphasize improvements in productivity and efficiency; the decision-making style is less proactive and more risk averse in maturity style (Su et al., 2014). The level of innovation decreases and a more bureaucratic organizational structure is established (Miller & Friesen, 1984).

In the revival stage environmental dynamism is higher; the organizational emphasis shifts to diversification and innovation with a greater deal of risk taking; the decision-making style tends to be more flexible and analytical (Su et al., 2014).

A final stage is associated with stagnation, profitability drops because of the lack of innovation and external pressure (Miller & Friesen, 1984).

The characteristics of management control systems differ across life cycle stages. According to Moores and Yuen (2001), attributes of management control systems change as a firm transits from one stage to the next. In particular, formality of controls increases from birth to growth and from maturity to revival (Moores & Yuen, 2001). The most authoritarian budgeting is used in the mature stage, whereas the growth firms use participative budgeting more often (Silvola, 2008). Su et al (2014) examined the association between diagnostic and interactive use of controls with organizational performance within organizational life cycle stages. According to their study, the interactive approach exhibited positive associations with performance in the growth stage, whereas in the revival stage, the interactive approach to using controls was found to be negatively associated with organizational performance. In the maturity stage the diagnostic use of controls was found to be negatively associated with organizational performance (Su et al., 2014).

On the other hand, the notion of an organizational life cycle plays an increasingly important role in innovation, since the innovativeness of an organization may change as it evolves (Koberg et al., 1996). Particularly, the correlations between innovation and facilitators of innovation differ substantially from early-stage to late-stage companies; for example, organizational life cycle moderates the effects of formalization on innovations, having a positive association with innovativeness in later-stage firms and a negative association in early-stage firms (Koberg et al., 1996).

4. Empirical Data

This section provides a description of the empirical data for the analysis of this research paper. The data consist of three cases that are described independently. Each case is characterized into four categories. First, a brief description of the company is presented, followed by the budgeting process for the overall company. Further, the innovation of the company is discussed and finally, the budgeting process for R&D activities is explained.

4.1 Probi AB

4.1.1 Background of the company

Probi AB is a leading bioengineering company that develops effective and well-documented probiotics. The company focuses on the research aspect of its products and outsources the production to manufacturing companies that have the required resources for producing these products. Probi's products are available in more than 30 countries worldwide. Probi is operating in two business areas; functional food and consumer healthcare. The company generates revenues through three business models; royalty from licensing of patented products, sales of products with its partners' brands and sales of ready-made products with its own brand. Probi has a strong collaboration with other companies and presently it has more than 100 partners worldwide (Official webpage of Probi, 2015). According to the interviewee, the company has a high growth rate (32% growth rate in 2014) with a strategy focusing on new markets, new products and new research areas. Probi is listed on Nasdaq OMX Stockholm in Small Cap. The company was founded in 1991 by two researchers without any definite decision regarding commercial focus, but now the company aims to commercialize and market its products. In 2014 Probi had a turnover of 135.2 MSEK and presently the number of its employees is about 30. Due to the nature and the focus of the company on research, half of its employees work in the R&D department and others in the marketing and administration department.

4.1.2 The Budgeting Process for the Overall Company

The interviewee stated that, the company prepares and uses a detailed annual budget for many years now. The budget is more detailed on the cost side than on the revenue side, this is as a result of the cost structure of the company and the inability to effectively predict the customers of the company due to high growing speed. In preparing the annual budget, information from the previous year's budget is used and adjustments are made based on the management's predictions for the market. According to the interviewee, the budget setting is not a time consuming process due to the simple cost structure of the company. The main costs are related to human resources of the company, such as salaries, insurances etc. These costs can be easily estimated and budgeted for, according to the CFO.

Probi takes a combined approach in the budget setting process. The process begins with formulating strategies by the top management and then a detailed budget is prepared in line with the strategies. However, in preparing the detailed budget, more emphasis is placed in the bottom up approach to allow middle managers to participate in the budget preparation.

Budgets are developed at a departmental level then compiled by the CFO in a single annual budget, which is then discussed with the Board for approval. During the year the budget is frequently revised, especially the revenue part, while the costs part is rarely revised.

The main function of the company's budget is for cost control purposes. Management uses the budget to control their expenses in order to avoid unnecessary spending of money and resources of the company. Therefore, variance analysis is considered to be important for the management. Although the company is not frequently faced with negative variances, especially on the cost side, nevertheless, management still analyzes variances to identify differences between the budget and actual as well as the causes of the variances. In addition to the control role that the budget serves, Probi has a cost conscious culture where all the employees are concerned with controlling their individual and departmental expenses to avoid overspending, as stated by the interviewee.

The performance of employees and departments in Probi is not measured and rewarded on the basis of actual results against budget targets. The interviewee stated that, the company has an incentive system that is related to the corporate profit and not directly linked to the budget

In addition to the annual budget, the company makes a five years financial plan which is mostly focused on customers. Unlike the budget, the financial plan is not developed on departmental level but rather at the top management level for the overall company. Moreover, the company makes quarterly forecasts that are more focused on the revenue aspect since the company's cost does not frequently change.

Furthermore, the management is presently considering abandoning the traditional budgeting and use of rolling forecasts instead.

“We actually spend not very much time on budgeting, but spend some time; however already in January or February we conclude that we cannot use it. So why we should use it, maybe we should find another method, maybe rolling forecasts”.

The management believes that the budget adds little value to the company and perceives it to be more meaningful in the previous years than now. According to the interviewee, actual costs can be compared to the previous year numbers rather than to the budget. However, no final decision has been reached at the moment.

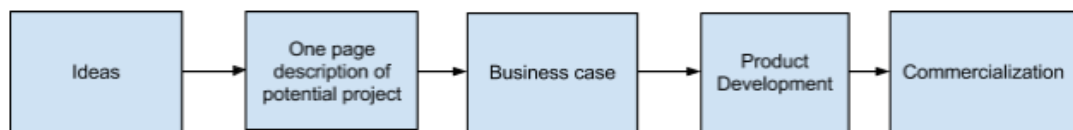
4.1.3 Innovation Strategy

Research and development activities are the core of the company's operations. Probi conducts research in the field of probiotic bacteria and through research identifies and patents different bacteria strains for the use in food and dietary supplements. New products and new clinical fields are the most significant parts of its strategy. Probi focuses on improving existing products and developing new product matrices. Thus, the company develops both incremental and radical innovations.

The loci of innovations differ dependent on the stage of the innovation process. At the general level, the company has Scientific Advisory Board which advises the Board of

Directors on the direction of research (Official Webpage Probi, 2015). Furthermore, the company's research department monitors global, cutting-edge research in order to develop and improve long-term knowledge building and product development. At a more specific level, the company generates ideas from discussions during meetings conducted by R&D department and the sales and marketing department as well as from partners of the company. Once an idea is been agreed upon, a one page description of the potential project is prepared and presented to project council for decision, whether to proceed with it or not. Furthermore, if the decision taken is to proceed with project, then a more formal and detailed description is prepared in the form of a business case. However, if an idea will lead to a large project, then it has to be approved by the executive of the company as well as the board. Further, Product Development Department is responsible for turning scientific research or ideas into final products. At this stage, the product ideas can come from Marketing Department as well, according to the interviewee. Production is outsourced whereas commercialization is performed by three business models; through licensing of patented products, sales of ready-made products under the brands of partners or sales of ready-made products under Probi's own brand (Probi's Annual Report, 2013). Figure 3 presents a summary of innovation process of the company:

Figure 3 Innovation process of Probi



Research and development activities are performed in projects. The company has a balanced portfolio of long-term and short-term R&D projects. Long-term projects are mostly related to clinical research, whereas short-term projects are performed in the product application area. According to the interviewee, each Project is run by a Project Manager and one project manager can oversee two or three projects simultaneously.

4.1.4 Budgeting process for R&D activities

R&D activities present a significant part of Probi's total costs. The company establishes a total R&D budget for the year. In parallel, project budgeting is performed apart from the annual budget and is made for every project separately. An individual budget is prepared for the whole duration of every project, and then the budget is divided into yearly spendings, taking into consideration the total R&D budget for the year that should not be exceeded. Based on the project budgets, the resources are allocated to each project including the time planned to be spent by the employees of R&D department for each project.

According to the interviewee, innovation projects are not restricted by the budgets:

“When it comes to R&D projects, the most important thing is not to keep the budget If it was allocated let's say 5 mln SEK for a project, and then the R&D manager comes and says

that they are really close now and need 1 mln more, and in most cases we say “do it”, because the value of a successful R&D project is so much bigger than the budget”.

However, the additional resources are allocated only using the budgets of other projects for the respective year by means of reallocations between projects, since the total R&D budget should not be exceeded. The reallocations of resources are performed on the basis of evaluation of all the projects running at the moment in terms of time and spent resources. Thereby the management identifies which projects are delayed and subsequently changes the design of the projects and their budgets.

As to the interplay between budget and innovation, the interviewee claims, that the budget does not restrict innovations as a management control tool by itself. The main inhibitive factor is the fact that Probi is a listed company and should meet the expectations of capital market:

“We have a very nice balance sheet... From time to time we discuss whether we should take a loan from a bank and run five more R&D projects, but then our profit will be affected by that, the share price will be affected and the owners won't be happy. If we haven't been a listed company, I think we would have spent more for R&D projects.”

One of the Probi's financial objectives is to exceed the net margin of 20% and the management controls the company's costs including R&D costs based on this financial objective. Moreover, the accounting rules are very important for R&D budget design since some development expenditures are capitalized in the balance sheet; other research expenses are taken to P&L. These rules are considered and discussed with auditors when allocating resources for projects.

4.2 CellaVision AB

4.2.1 Background of the company

CellaVision is an innovative, global medical technology company that develops and sells its own leading systems for routine analysis of blood and other body fluids in health care services. The company's products are sold globally via the suppliers of equipment in parallel with its own sales directly in the Nordic region and via its subsidiaries in the US, Canada and Japan (Official website of the company, 2015). CellaVision has a growth rate of 21% in 2014, with a strategy that is focused on global expansion, product development, new opportunities and forms of partnership. The company is listed on the Nasdaq OMX Stockholm in Small Cap list and had a turnover of 216, 9 MSEK in 2014. The number of employees is 72 in the end of 2014 (CellaVision's year-end bulletin, 2014).

4.2.2 Budgeting process for the overall company

According to the interviewee, CellaVision prepares and uses a traditional budget. The budget setting process of the company begins in August with the sales projections for the following year; thereafter an expense budget is prepared. The management uses the previous year budget figures and makes modifications when compiling the next year budget. From the

CFO's point of view, preparing the budget for the company is not a time consuming process due to the use of spreadsheets and the size of the company.

The company combines both top-down and bottom-up approaches in the budget setting process. The top management sets the targets for the different regions that are in line with the long-term strategic plan of the company. Then the departmental managers are involved in identifying the activities that are needed to achieve the set targets. The annual budget of the company can be revised up to mid-January when the Board approves the budget. Afterwards, it is not revised for the rest of the year.

According to the CFO, the main function of the budget is for planning purpose. It is used to translate the company's long-term strategic plan into yearly operational goals.

“The most important purpose probably is how budget fits into a longer strategic plan.. it is a good way to consolidate what activities we have to achieve our targets, our strategy.. and also a good way to prioritize, it's a good planning exercise to actually incorporate the long-term strategy into daily technical work.. Budget is a good bridge between those.”

Variance analysis is performed on a monthly basis, and a more thorough analysis on the quarterly basis. The CFO analyzes and discusses variances with the responsible managers in order to identify the reasons for deviations and possibly learn from them. The company does not stick to the budget if the management sees an opportunity beyond the budget.

“We are not slaves of our budget... The question is what you do with your deviations? Can you learn from them? Can you maybe in the middle of the year change your strategy slightly to improve better?”

In this company, the performance of employees is not measured based on budget targets. According to the interviewee, there are many factors, such as luck, that may influence the performance of employees and departments besides the budget. The company does not consider meeting the budget target as good performance.

“We try to separate from what is good or bad luck, and what is good or bad management, because you can have a fantastic performance in one region, but its good luck, maybe your region is growing very fast or something like that and vice versa”.

4.2.3 Innovation Strategy

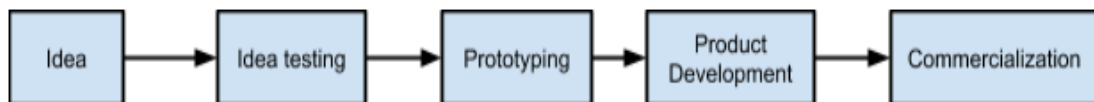
Product development and technical innovation are part of CellaVision's growth strategy. The company primarily carries out its own development, but the strategy also includes development through cooperation with partners. Through the years the company's product development has generated 22 patented inventions and 47 patents (CellaVision Annual report 2013). According to the interviewee, CellaVision is currently conducting several development projects, aimed at strengthening the company's product portfolio, and also has planned some areas for future development.

The innovation strategy of CellaVision is focused on continued development of existing and new products and solutions mainly in the hematology area, but also includes investigating the possibility of expansion to other areas of laboratory medicine. Thus the majority of innovations are incremental, although radical innovations sometimes occur as well.

The interviewee stated that new ideas are generated from different sections throughout the organization. The majority of ideas are originated from the R&D department, but also the sales and marketing department participates in the idea generation based on the meetings and interactions with customers. In addition, the Board and top management as well as the company's business partners can come up with new ideas for exploration.

After the idea generation, the R&D department conducts a test on the features of the new concept. Further, a prototype is designed to prove the feasibility of the concept. If the prototype is successful, the management makes an evaluation of the required resources for the product development, as well as the potential future revenues to be generated from the sales of the product. After the evaluation process, a project manager is appointed and development is initiated. The developed products are sold globally via the suppliers of equipment in parallel with its own sales directly in the Nordic region and via its subsidiaries in the US, Canada and Japan. Figure 4 presents a summary of innovation process of the company:

Figure 4 Innovation process of CellaVision



4.2.4 Budgeting process for R&D activities

R&D expenditures are prioritized in the budget of the company and are given more consideration than other costs. According to the interviewee, if the company faces financial difficulties, the management can reduce other costs but not related to R&D activities.

As previously stated, the process from idea generation to final product development involves different stages. During the testing and prototyping process, resources are allocated when needed. After the prototype is designed, a project budget is prepared by the project manager for the whole estimated duration of the project which might last for up to 3 years. Yearly expenditures of every project are included in the overall budget of the company.

The progress of projects versus incurred costs and time is evaluated and discussed during monthly Project meetings. The reallocation of resources between the projects and allocation of additional resources are decided during these meetings. Project managers can exceed their project budget if reasonable explanations regarding reasons for overspending are provided.

In addition, the company has a cost conscious culture and all employees are concerned with value of money and make wise spending. As a result of the cost conscious culture of the company, project managers are trusted in making estimates for the project budgets.

4.3 Active Biotech AB

4.3.1 Background of the company

Active Biotech is operating on pharmaceutical research and development in the medical fields. The company has a research portfolio which primarily consists of projects for the development of drugs for the treatment of autoimmune/inflammatory diseases and cancer (Active Biotech Annual report, 2013). Presently, Active Biotech does not have any product approved for sale, since pharmaceutical development is a time-consuming process and lasts for 12-15 years. Currently, the company recognizes operating losses and generates the revenues mainly through milestone payments from licensing partners. The company's business strategy includes achieving growth in value of every project, collaboration with strong partners and obtaining progress in the pharmaceutical development projects.

Active Biotech is listed in NASDAQ OMX Nordic and had a turnover of 10.4 MSEK in 2014. The company has 56 employees, out of this total; around 70% work in the R&D department.

4.3.2 Budgeting process for the overall company

According to the CFO, a more traditional way of budgeting was used in his first years with the company. However, the company changed their method of budgeting and abandoned the word "budget".

"I don't really use the name "budget", because "budget" for me sounds so oldish ... for me it's a projection...that is what I do. I do projections, forecast projections".

Presently Active Biotech prepares and uses rolling forecasts. The rolling forecast set period of time is 12 months. After the first quarter has passed, that quarter is dropped from the beginning of the forecast and another quarter is added to the end of the forecast. The CFO stated that the forecasting process is not complex and time-consuming, particularly its cost side, since it is mostly related to salaries and payments to CROs, therefore can be easily predicted. However, the revenue part is slightly complicated for projection because it mainly relies on the agreements with partners. The forecasts are not too detailed and are prepared on an aggregated level due to the cost and revenue structure of the company. The interviewee does not break down the "budget" to different sections.

The CFO adopts top-down approach when preparing forecasts, but sometimes involves departmental managers if it is necessary. He believes that most of the company's employees are scientists who should not be engaged in the budgeting process, but rather should focus on the research activities that add more value to the company.

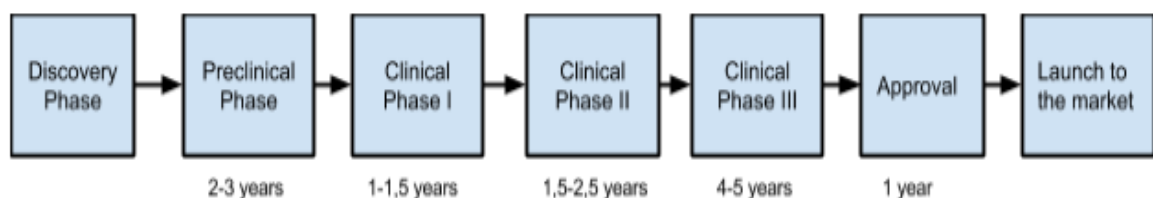
“It’s only on the Board level or the management level that we have the projection or forecast. The people down there in the organization... I don’t involve them at all...I don’t want people to spend time on something that doesn’t add value to the organization... they should focus on their activities”.

The main role that the company’s rolling forecasts serve is for planning purpose, especially for cash-flow projection. The CFO makes forecasts to plan how the resources will be acquired and spent to make sure that the resources are available when they are needed. The company’s forecast is revised quarterly to take into considerations the changes that occurred during previous quarter, the reasons for the changes, and new available information in order to make the next projection more accurate. Variation analysis is performed with the same purpose, to improve forecasting ability, according to the interviewee.

4.3.3 Innovation Strategy

The pharmaceutical research and development are the core activities of Active Biotech. The development process is complex and time-consuming, and it is divided into Drug Discovery and Drug Development Phases. In the drug discovery stage, Active Biotech relies more on the scientists of the company who are intrinsically motivated to bring new ideas generated through researches into their operating activities. The development stage is divided into Preclinical and Clinical phases (Company's official website, 2015). The Preclinical development involves testing of a drug on animals which is done within 2-3 years, whereas in the clinical development the drug is tested on humans. This process is further divided into three clinical development phases. In the first phase the drug is studied within 1-1.5 years on a small group of healthy volunteers. The next phase involves testing of the drug on a larger group of patients (50-200) and covers a period of 1.5-2.5 years. In the clinical phase 3 a confirmation of studies is performed, but rather on a larger scale (100-1000 patients) for 4-5 years. The two last phases are mainly outsourced to CRO (Clinical Research Organizations), which possess the required resources for testing the drugs on patients in different countries. Further, the drug undergoes a regulatory approval process for approximately 1 year before being introduced in the market Figure 5 presents a summary of innovation process of the company:

Figure 5 Innovation process of Active Biotech



The Drug Development process requires immense financial resources. The total costs involved in the development of a successful project are around 700 MSEK. The third clinical phase is the most costly and therefore is out-licensed to partners.

Currently, the company is running three different projects; two of them are in the clinical stage 3 and one in its preclinical phase. The company is focused more on the clinical development in later stages and allocates a greater part of resources on the respective projects, according to the interviewee. Because of the company's focus on the projects which are in their later stages, the innovations that currently occur in the organization are mainly incremental and are moving within the existing strategic trajectory.

Innovation in Active Biotech takes place in the discovery and preclinical phase of project development. In these phases, the scientists of the company are intrinsically motivated to bring new ideas generated through researches into their operating activities. However, in the last two phases innovations or changes rarely occur because of high regulation by authorities in the pharmaceutical industry.

4.3.4 Budgeting process for R&D activities

According to the interviewee, the company does not prepare a separate budget for R&D activities, since Active Biotech is a research company and the overall rolling forecast used in the company is concentrated on the R&D activities. When a new project is initiated, a project budget is prepared for the Board to evaluate the resources and time required for the successful development and completion of the project. However, these project budgets are not used for costs control purpose, but rather for initial evaluation of the projects.

The CFO mentioned that the company makes yearly projections for its projects to plan the resources. Every quarter, the company conducts a Project Review Board (PRB) meeting to evaluate the progress of its projects and prioritize the resources among the projects. Reallocations of costs between the projects are decided by the PRB during its quarterly meetings.

According to the CFO, the primary objective of Active Biotech is to launch its products in the market, therefore the company is more concerned with the time required to complete a project than the costs, thus can allocate resources to accelerate progress of the projects. However, this statement is more relevant for the projects in the later clinical development stages, whereas the projects in the earlier stages may sometimes be delayed.

5. Analysis and Discussion

In this section, the empirical data from the cases is compared, analyzed and discussed in detail. As previously stated, a cross-case analysis is done in this section to identify the similarities and differences between the cases. The data is further compared with theory using pattern matching. This section, similar to the empirical data section, is classified into three categories; first, the description of companies, followed by the budgeting process for the overall company and finally, the budget and innovation. Table 3 presents the summary of the findings that will be discussed below.

Table 3 Summary of findings

		Probi AB	Active Biotech	CellaVision
	Characteristics			
Description of Companies	Industry	Pharmaceutical	Pharmaceutical	Pharmaceutical
	Size	Small (30 Employees)	Small (56 Employees)	Small (72 Employees)
	Stages of business cycle	Rapid growth stage	Birth stage	Growth stage
Budget for the overall company	Budgetary system	Budget	Rolling Forecast	Budget
	Approach	Bottom-up and Top-down	Top-down only	Top-down and Bottom-up
	Style of use	Interactive	Not interactive	Interactive
	Main emphasized function of the budget	Both control and planning	Planning	Planning
	Budget link to performance evaluation	Not linked	Not linked	Not linked
Budget and Innovation	Type of innovation	More incremental	Radical	More incremental
	Loci of innovation	Different parts of the organization	Only R&D department	Different parts of the organization
	Role of budget for innovation strategy	Support the execution of deliberate strategy and provide a framework for innovation	Resources allocation and planning	Support the execution of deliberate strategy and provide a framework for innovation
	Role of budget in each stage of the innovation process			
	idea generation	Less formal control	Less formal control	Less formal control
	idea conversion	More formal control	Planning and estimation of required resources	More formal control
	idea exploitation	More diagnostic use	-	More diagnostic use
	Budget flexibility for R&D	Reallocation but not exceeding the overall R&D budget	Reallocation	Reallocation with possibility to exceed the budget
	Prioritizing either time or cost	Prioritize time	Prioritize time	Prioritize time

5.1 Comparison of Companies' Background and Life Cycles

All three analyzed entities are listed companies operating in pharmaceutical industry, specifically Probi in bioengineering in functional food and consumer healthcare areas, Active Biotech in biotechnology research and development of drugs, and CellaVision in medical analyzers and software. These sectors encounter high uncertainty in both demand and technology and require greater innovation management than other industries (Dyer, Furr & Lefrandt, 2014). It is noteworthy, that the biotechnology sector, in which Active Biotech operates, faces high risks and uncertainty alongside with stretched timelines for product development, compared to other analyzed companies. Further, all the three companies are small in size and have a significant number of their employees working in the R&D department. Research and Development activities are the main focus for all three companies whereas manufacturing is outsourced by all companies and commercialization of products is partly outsourced by both CellaVision and Probi while Active Biotech fully outsourced commercialization.

The analyzed companies are in different stages of the organizational life cycle. Biotech and software sectors, in which the analyzed companies operate, have specific characteristics regarding the irrelevance of age and size of a company when defining the stage of its organizational life cycle (Granlund & Taipaleenmaki, 2005). The establishment of a biotechnology company is tougher and longer than it is for most other companies (Malik & Hine, 2011). Thus, Active Biotech is still in its birth stage of development since the company does not have any approved product for sale. Probi is undergoing the rapid growth stage of the business life cycle and has several products on the market with the focus of increasing sales and expanding into new and existing markets. CellaVision is also in the growth stage although its growth rate is lower compared to Probi.

Organizational life cycle theory is argued to be applicable for management accounting research and provide patterns of multiple contingency factors and internal characteristics (Moores & Yuen, 2001). The formality of management control systems enhances from birth to growth stage and the companies increase their reliance on formal control against informal from birth to growth (Moores & Yuen, 2001). In line with these arguments, Active Biotech relies more in informal communication and less on the budgetary system than Probi and CellaVision which use their formal management control systems more extensively to satisfy the increasing demand in information and ensure organizational efficiency. The needs for product cost and profitability analysis in these companies are greater than in Active Biotech that is in line with the findings of Granlund and Taipaleenmaki (2005), and also Simons (1995) who noted that diagnostic control emerges at the growth stage.

5.2 The Budgeting Process for the Overall Company

In this part we discuss and analyze the characteristics of overall budget design and use and the revealed patterns affecting them in the analyzed companies.

5.2.1 Budgeting alternatives

Budgeting practices differ among the three analyzed companies. Probi and CellaVision annually prepare and use budgets in contrast with Active Biotech which has discontinued using traditional budgeting and currently applies rolling forecasts. The choice between traditional annual budgeting and rolling forecasts can be related to the organizational life cycle (Granlund & Taipaleenmaki, 2005) and related environmental uncertainty and unpredictability (Van der Stede, 2000; Ekholm & Wallin, 2011). In this regard, Active Biotech faces more uncertainty and unpredictability. The biotech sector in which it operates is further characterized as an ultra-slow industry with long product development times, unpredictable results and high risks, and is associated with a high degree of inherent project uncertainty (Schmid & Smith, 2004). Moreover, the company is in its early development stage and does not have any approved product for sales yet. The revenue side is particularly unpredictable since financial resources are raised through agreements with partners and share issues and are not permanent and stable. Uncertainty and low predictability imply a need for more flexibility with regard to upcoming opportunities rather than commitment to fixed budget targets (Ekholm & Wallin, 2011). Rolling forecasts provide the companies required flexibility through continuous updating information and bringing greater opportunities for learning (Haka & Krishnan, 2005). Thus, Active Biotech uses rolling forecasts to achieve flexibility and improve planning function due to the resource uncertainty, which is related to the revenue side highly dependent on the agreements with partners in absence of constant revenues from sales, considering that the company does not have any approved product for sale yet, as well as to the long duration and high costs of product development. These reasons are in line with the findings of Granlund and Taipaleenmaki (2005) that short time scope of planning due to environmental uncertainty is the reason why annual budgeting is losing its relevance in biotech firms during early stages of development. The focus in these firms is on the ex-ante planning rather than on ex post profitability analysis, therefore the rolling budgeting or forecasting is more suitable for these firms (Granlund & Taipaleenmaki, 2005).

The level of resource uncertainty of Probi and CellaVision is considerably lower compared to Active Biotech due to a more stable financial position, generating revenues through the sales of its products, the shorter product development times and less expensive product development. The companies are in the growth stage when there is a need for a greater financial planning, cost control and profitability analysis (Granlund & Taipaleenmaki, 2005). Accordingly, they use annual budgeting to meet the increasing expectations of their shareholders and demand for a more formal control. This is in line with the notion of Simons (1995) regarding the increasing emphasis upon the use of budget as a diagnostic control. However, it is noteworthy that Probi is considering abandoning traditional annual budgeting in favor of rolling forecasts due to the high rate of growth of the company and need to update its planning system more frequently.

“The budget was more meaningful: we were very close to breakeven on the profit level, and we really wanted to become a profitable company. We managed the costs with the help of budget. But now the budget is obsolete almost when it is done. It is up to the kind of the company, stage of development and situation...” (CFO, Probi)

Traditional annual budget was considered more suitable when the company was in its transition from the early stage to the next stage of development. It is in line with literature that argues that the transition from one life cycle stage to another is characterized with a higher formality of controls (Moore and Yuen, 2001). After the transition to the growth stage, the companies need a greater flexibility of their formal control systems as the contradiction between innovation and control increases (Granlund & Taipaleenmaki, 2005). The ways in which the companies achieve required flexibility are discussed in the following sections.

5.2.2 Budget setting approaches

The analyzed companies use different budget setting approaches. The CFO of Active Biotech mainly applies top-down approach and involves departmental managers only if it is necessary. He is aware of all information about the activities that is needed for the rolling forecast preparation, and the departmental managers should not be distracted from their main duties. This is particularly important in view of the negative side of rolling forecasts, related to preparing projections four times a year and consequently taking more time (Churchill, 1984). Bottom-up approach in this sense would distract lower level managers, particularly R&D managers, from their direct duties even more frequently than traditional annual budgeting.

“It’s only on the Board level or the management level that we have the projection or forecast. The people down there in the organization, I don’t involve them at all...I don’t want people to spend time on something that doesn’t add value to the organization... they should focus on their activities”. (CFO, Active Biotech)

Furthermore, top-down approach incorporates best economic projections, company planning parameters and resource availability (Churchill, 1984), that is in line with the priorities of Active Biotech, forecasting system of which is focused on cash-projections due to the resource uncertainty.

In contrast, Probi and CellaVision combine both top-down and bottom-up approaches: top management sets strategic targets in line with the long-term strategic plan of the company, and then the departmental managers identify the activities that are needed to achieve the set targets. This approach has a number of advantages. Firstly, bottom-up approach allows lower level managers to participate in the budget preparation process since they possess more information about activities, and thereby can reduce information asymmetry (Cheng, Chen & Shin, 2014). Further, budgetary participation has positive effects on job satisfaction and performance of participating managers, since it gives the feeling of equal opportunity to communicate their opinions and have influence on the decision-making (Covaleski et al., 2006). Consequently, this approach is particularly favorable when the budget is used for control purposes and a greater emphasis is put on it, since budgetary participation and communication can increase employee acceptance of budgetary objectives (Brownell, 1983). This can partly explain the difference in applied approaches of budget setting process in Probi and CellaVision on the one side, and Active Biotech on the other side, since Active Biotech prioritizes planning function and avoids calling its planning system as “budget”.

5.2.3 Interactive use of budgets

The combination of top-down and bottom-up approaches in Probi and CellaVision enables more intensive communication between top management and employees. During budget setting process, top management communicates the company's strategic goals and expectations to the middle and lower level managers, who in turn communicate the information they possess regarding environment, opportunities and threats. The interaction between top management and lower level managers is not limited only in the setting process, but also takes place when variances occur. All deviations are discussed with the purpose to understand the reasons, whether any corrective measures should be taken and what alternative responses can be used. Some variations are not subjects to corrective measures and are strategically justified. This ongoing dialogue is the sign of interactive use described by Simons (2005). The possibility to use budgetary system interactively, alongside with a diagnostic use, contests the claim that budget as a formal management control system hinders innovation (Bisbe & Otley, 2004), that can be observed in the two analyzed companies which use annual budgets and are highly innovative. Even more, an interactive use of budget contributes to successful innovation, according to Simons (2005). This contribution is enabled through moderating effect of budget on the impact of innovations on performance: budget reduces the risk of excessive and inadequate innovation, on the one side, and reduces the risk of too little innovation through budgetary communication, on the other side (Bisbe & Otley, 2004). Thus, in Probi and CellaVision the management discusses innovation projects at hand when setting the budget taking into account strategic objectives for efficiency and growth of the company. They select some projects to be reserved for future balancing between the risks of excessive innovation that can affect the annual performance and the needs of growth strategy for innovation. Furthermore, interactive use of budgets is particular important for the companies in the growth stage, according to the findings of Su et al. (2014) who claim that interactive approach of management control tools is positively associated with organizational performance particularly in growth stage.

Active Biotech in contrast does not use rolling forecasts interactively and applies other methods to exchange information between top-management and employees. More informal communication prevails in the company due to the early stage of organizational development and radicalness of the innovations. These findings are in line with the research of effects of life business life cycles conducted by Su et al. (2014), who found no significant association of interactive and diagnostic use of budgetary controls with performance in the birth stage of the company's life cycle.

5.2.4 Planning versus control function of budget

According to Churchill (1984), budgets have two primary functions: planning and control, and the companies must decide which function is more important and then resolve a number of design and formulation issues. He concludes that small and innovative companies should be more concerned with planning aspects of budgeting. If budgets are used predominantly as a planning tool against control tool, then such budgetary system is positively impacting the relation between product innovation and financial performance, and therefore planning

function should be prioritized (Dunk, 2011). These observations are in line with the analyzed companies. The CFOs of Active Biotech and CellaVision pointed the planning as a foremost function of budgeting. Active Biotech uses rolling forecasts primarily for planning purpose, specifically for cash-flow projection, since the company does not have stable revenues and a rolling forecast is essential for planning when and how the resources will be acquired and spent to make sure that the resources are available when needed to run the initiated projects. The CFO of CellaVision believes that budget connects strategic planning with daily activities, accordingly, budget is considered as a planning tool used to consolidate the activities and allocate resources needed to achieve strategic goals.

“The most important purpose probably is how the budget fits into a longer strategic plan. It is a good way to consolidate what activities we have to achieve our targets, our strategy, and also a good way to prioritize. It is a good planning exercise to actually incorporate the long-term strategy into daily technical work. Budget is a good bridge between those.” (CFO, CellaVision)

In contrast, the CFO of Probi accentuated cost control role of budget used to avoid unnecessary spending, and emphasized the company’s concerns about stable profit expectations of stock market.

“Budget adds value to the cost side because it gives you the opportunity at least once a year to look at what kind of costs we have here”. (CFO, Probi)

However, the fact that the company revises the budget during the year indicates that the planning aspect is as well important for the company. According to Churchill (1984), the companies that revise their budgets stress the planning side of budgeting against the control function. Revised budgets are more accurate for planning purposes, but revision makes a budget less convenient for control (Churchill, 1984). Moreover, the company is considering abandoning annual budget due to the fast growing sales and is seeking a way to improve its budgetary system to make it more suitable for planning purposes. Another sign of prioritized planning role of budget is the fact that none of the three analyzed companies evaluates the performance of employees on the basis of actual results against budget targets. According to Churchill (1984), if the major role of the budget is planning then using budget estimates as a basis for performance evaluation and compensation can reduce accuracy referring to the possibility of budget games on the part of managers who can influence the setting process by making targets much easier to achieve or on the part of top management who can set very difficult targets to influence motivation of employees. Thus the analyzed companies do not use budgets to evaluate managers’ performance and set realistic targets for a successful planning budget that is in line with the theory (Churchill, 1984).

In addition to the planning function of budget, two of the analyzed companies use budgets for control purposes as well: Probi and CellaVision monitor their progress towards budget estimates and compare actual results with budgeted figures, what is in line with the interpretation of controlling function of budgets (Anthony & Govindarajan, 2007; Shim & Siegel, 2008). However, the budgetary control can be characterized with different degrees of tightness depending on the emphasis that the management puts on meeting the budget, the

tolerance that it has towards budget deviations and the level of controlled detail in budgets (Van der Stede, 2001). Probi places more emphasis on meeting the budget on a short-term basis due to its concerns about stable profit expectations of stock market. However, it is more focused on the bottom-line result, and achieves needed flexibility through reallocations of resources. The CFO of CellaVision stated that the company can exceed the budget if there is an opportunity beyond the budget that is in line with the strategic goals or can even influence the strategy. Thus, there are some signs of less tight control in CellaVision than in Probi. As to Active Biotech, it can be noted that control function of rolling forecasts can hardly be identified, according to the information obtained from the interviewee. The CFO performs variance analysis inherent to control function of budgets; however, deviations are analyzed in order to make the forecasts more accurate.

5.3 Budget and Innovation

In this part we turn now from the patterns affecting companies generally to those characteristics particularly associated with their striving for innovation, and analyze the relationship between those characteristics and budgetary system.

5.3.1 Role of budget for innovation strategy

Innovation is a significant part of the business strategy of each analyzed company. It is defined by the type and locus of innovations in the company (Davila, 2005). Based on the information obtained from the interviewees, the innovation strategies of Probi and CellaVision resemble. The majority of innovations are incremental, although radical innovations can happen. Probi is concentrating on improving existing products, developing new products on the basis of discovered probiotics and also searching new clinical fields for the application of probiotics. CellaVision is mainly focusing on the continued improvement of its existing products and development of new products in the hematology area in which it is currently operating. As to loci of innovations, new ideas in Probi come from different parts of the organization, including R&D and Marketing departments. Furthermore, the company has Scientific Advisory Board which gives advices to the top management regarding directions of research, and an employee who monitors global research in order to develop and improve long-term innovation strategy. Similarly to Probi, CellaVision has several loci of innovation. The majority of ideas in the company are originated from the R&D department, also from the Sales and Marketing department and top management. Based on the incremental innovations and different loci of innovations, including top level, innovation strategies of Probi and CellaVision combine features of deliberate strategy imposed by top management and emergent strategy through induced strategic actions throughout the organizations (Davila, 2005). Budget as a management control system (MCS) is expected to support the execution of the deliberate strategy and translate innovations into value, on the one side, and provide a flexible framework to capture learning and setting to exchange information (Davila, 2005). In line with the theory, the budgets in Probi and CellaVision are used to translate their strategies into yearly plans with specific targets and monitor the progress towards these targets. In the same time, budgets are designed and used to be flexible to capture emerging opportunities and respond to uncertainty. Both companies use budgets interactively during setting process and

also during budgeted period. Probi revise its budget, CellaVision can exceed the budget if sees any opportunity beyond the budget and analyze deviations from the budget from the strategic perspective.

“We are not slaves of our budget... The question is what you do with your deviations? Can you learn from them? Can you maybe in the middle of the year change your strategy slightly to improve better”? (CFO, CellaVision)

The CFO of CellaVision stated that variations are considered essential for learning and strategic change, what is in line with the description of a MCS that not only helps to execute the strategy but also captures learning (Davila, 2005).

The innovation strategy of Active Biotech differs from the other two analyzed companies. Active Biotech develops new drugs which can be considered as a radical innovation. This type of innovations is more unpredictable and uncertain about ends and means with longer time horizons (Davila, 2005). As to locus of innovations in Active Biotech, new ideas are obviously generated by its scientists in the R&D department. This model of innovation strategy requires a strategic context that can be provided by MSC for the creation and growth of radical innovations (Davila, 2005). Informal controls, collaboration and intrinsic motivation are more important to manage these innovations in Active Biotech, whereas rolling forecasts as a MCS are used for resource allocation with an emphasis on the planning function what is in line with the model described by Davila (2005). Furthermore, rolling forecasting enables more frequent resource allocation during the year, since it is updated quarterly what is important for radical innovations.

5.3.2 Budgeting in innovation process

The analyzed companies have some similarities and differences in innovation processes that turn ideas to commercial products. They will be presented by the main stages of the process: idea generation, conversion of the idea into a product and exploitation of the product. In all the three companies the first stage is less susceptible to formal budgetary control. These findings are consistent with other research (Chiesa et al., 2009). Drug discovery in Active Biotech is the most unpredictable regarding the time stage, which is driven by intrinsic motivation of scientists. In CellaVision new ideas are tested and prototyped and only then a formal project budget and schedule are prepared to monitor the progress of innovation. Similarly, in Probi a project budget is set after evaluating the business case.

”In a creative process it’s really hard to say what exactly we want to do... We want to make an invention in this area, but it’s rather fussy. In a creative process it’s really hard to pinpoint what resources you need because when you go through you change your mind, you can go this way instead of that way”. (CFO, CellaVision)

In the next stage of conversion of the idea into a product, innovation projects become more structured and formalized. In CellaVision the development stage begins with formalizing a project budget and schedule, which are used to monitor the progress of the project during its development. Project budget is prepared by Project Manager who is trusted to make required

estimations of time and resources and who is responsible for tracking the budget implementation. Deviations are discussed and considered critical for learning. In Active Biotech, the drug development is highly formalized regarding procedures due to the regulations in the industry. At this stage the company prepares a project budget to evaluate the project and make a decision about initiation of the project. However, this budget is not used to control the costs of the project. Budgetary cost control of this stage is less meaningful than in CellaVision because Clinical Phases of Drug Development are outsourced to CROs and the costs are fixed in contracts and are not influenced afterwards by the company. In Probi some activities of development stage are performed in-house and clinical phase is outsourced to CROs. The company prepares a budget for every project at this stage; however cost control function of project budget is insignificant.

“Cost controlling in a project once it is started is not a big issue. We do not need to put so much effort on that. We have fixed prices from our partners during the trials and deviations are very rare”. (CFO, Probi)

The last stage of innovation process is related to commercialization of the product. This stage is more exposed to diagnostic control of budget In Probi and CellaVision the sales are constantly analyzed against budget estimates. These findings are in line with previous research (Chiesa et al., 2009). Active Biotech differs in this regard since the company does not have its products in the market yet.

5.3.3 Budget flexibility for R&D activities

Since innovation is a significant component of strategy in the analyzed companies, research and development costs account for a substantial part of their budgets. These costs are strategically prioritized in the companies.

“Overall performance, quarter by quarter, is important, but for good growth reasons or future revenue reasons we can sacrifice the short-term performance if we need to. Even if we are cost conscious, even if we have some poor financial performance, we don’t cut down the R&D and customer visits. These two are our future lives”. (CFO, CellaVision)

The CFOs of the analyzed companies acknowledge the uncertainty and unpredictability of innovation process and consequently innovation costs and anticipate the limitations of budget in this regard. By means of discussions of project progress and project budgets and exchange of information between top-management and R&D managers, that is defined as interactive style (Simons, 2005), the budget is not considered as a limitation for innovations by the analyzed companies.

“When it comes to R&D projects, the most important thing is not to keep the budget If it was allocated let’s say 5 mln SEK for a project, and R&D manager comes and says that they are really close now and need 1 mln more, and in most cases we say “do it”, because the value of a successful R&D project is so much bigger than the budget”. (CFO, Probi)

At this point it is important to differentiate between total R&D budget as a part of overall annual budget and project budgets. Thus the required flexibility is obtained through

reallocations of resources between the projects within the annual budget or through allocation of additional resources beyond the budget Probi tries not to exceed annual R&D budget and reallocates the resources between the projects during the year: it suspends one project in order to provide additional resources for another project. CellaVision is less conservative in this regard and can exceed the annual R&D budget, if there are reasonable explanations. This difference can be explained by Probi's concerns about shareholders' expectations for profit, on the one hand, and high rates of growth due to the exploitation of existing products on new markets. CellaVision is less concerned about short-term performance since it needs a new period of growth.

“We can exceed it if we have a good explanation why we want to exceed. Maybe we need to bring external consultants on board to finalize the project faster. If we have a product ready for the market in a faster time, and then it might be a good business decision to actually accelerate the project.”(CFO, CellaVision).

Thus the companies are not limited by yearly resource allocation of traditional budgeting and revise allocations during year, reconciling thereby budgetary control with budget flexibility that is in line with the findings of the case study by Frow et al. (2010). Active Biotech also reallocates resources between the projects when rolling forecasts if needed.

5.3.4 Prioritizing time over costs

As mentioned above, the analyzed companies reallocate the resources between the different R&D projects or allocate additional resources beyond total R&D budget during the year. All three companies indicate the time as a priority when making these decisions. Taking into account the tradeoff relationship between budget and time as two project limitations, in many cases there is a need to prioritize one of them as the main limitation (Lendyuk & Rippa, 2009). Active Biotech places a priority on time and can allocate additional resources to accelerate the progress of the some projects, particularly the projects in their later stages due to the closeness to the market launch. Similarly, Probi and CellaVision emphasize the importance of timely delivery of the project even at the expense of its cost side.

“An important thing for us is really to rather spend more and do what we supposed to do quicker instead of trying to keep back spending. Time is essential”. (CFO, Active Biotech)

Thus, the companies prioritize time as the main limitation of their innovation projects. This time-orientation defines time-based innovation strategy of the companies that has effect on the accounting and control priorities, leading many times to favoring non-financial focused control systems (Davila et al., 2004), and prioritizing planning over control (Granlund & Taipaleenmaki, 2005). Accordingly, time-pressure diminishes the cost control function of project budgets. Similarly, Abernethy and Brownell (1997) stated that where the time is at premium, other controls will be preferred to formal controls. In this regard, Active Biotech is more concerned with time-to-market of its first product since it is in the early life cycle stage. This temporal orientation is another explanation for prioritizing planning over control in the company's budgetary system and the consequent choice to use rolling forecasts.

6. Conclusion

In this section, we will conclude the findings of our research and present answers to our two research questions. The section will further present how this thesis contributes to the research landscape, the limitations of the research and avenues for future research.

6.1 Summary of findings

The aim of the present thesis was to explore how the innovative companies design and use their budgetary systems and why they make these particular choices. Innovative company settings are of particular interest because these companies have specific requirements concerning their management control systems: they should balance between their needs for control and creativity for developing innovations, between efficiency and flexibility. The findings of this study show that the companies take different approaches when designing and using their budgetary systems. These differences can be explained by the organizational characteristics, such as the stages of organizational life cycle, as well as by the characteristics particularly associated with innovation, especially innovation process and innovation strategy in general. Accordingly, Active Biotech uses rolling forecasting and places a strong emphasis on its planning and forecasting functions. The company relies more on informal controls and do not use budgetary system interactively, avoiding budget emphasis in the company. This approach can be justified by a high level of uncertainty and unpredictability related to the early stage of organizational development with unstable revenues, as well as to its innovation strategy. The company develops radical long-term innovations with unpredictable process of discovery driven by intrinsic motivation of scientists that diminishes the applicability of budgetary control. Further, clinical development stages are outsourced and payments to the companies are made based on the agreements; so that there is no need to use budgetary system to control these costs. The commercialization stage of innovations is not yet obtained by Active Biotech, and this is another explanation of a lesser need for diagnostic control system, since this stage of innovation process is characterized by a greater exposure to diagnostic budgetary control. All these findings justify the use of rolling forecasts for the planning purposes as a context for the creation and growth of radical innovations in the company.

In contrast, Probi and CellaVision practice more traditional annual budgeting. Both companies are in their growth stage which is characterized by an increasing formality of management control systems compared to the early stage. The two companies balance between planning and control roles of their budgetary systems. We discovered a number of attributes of loose control and emphasized planning function in both cases. Furthermore, the two companies use their budgets interactively and consider them as a framework for communication between top-management and lower level managers. This interactive style of use allows the companies to learn from deviations and overcome the limitations of diagnostic paradigm of budgetary control.

Moreover, the findings of the present study show that the three companies prioritize time in their innovation strategies and project management. The time concern diminishes the

control function of the budget and requires more flexibility of the cost side that is obtained mainly by means of resource reallocations between projects. Thus, flexibility, interactive use and emphasized planning function are the main features of the budgetary systems of Probi and CellaVision that supports the execution of deliberate innovation strategy translating innovations into value, and simultaneously provides a flexible framework to capture emerging opportunities and respond to changing environment.

6.2 Discussion of research contributions

This paper contributes to the budgeting research in several ways. First of all, our findings complement and add to the previous research of interplay between budgeting and innovation in a large organization conducted by Marginson et al. (2006), by providing evidence of how small innovative companies design and use their budgetary systems to balance between control and flexibility. In particular, our findings corroborate the conclusions of previous studies that formal management controls can be flexible to meet the needs of innovations by means of interactive use (Simons, 1995; Bisbe & Otley, 2004) and emphasized planning against control function (Dunk, 2011), especially when the time is prioritized over the costs in the innovation strategy (Granlund & Taipaleenmaki, 2005).

In addition, our findings add to the study about the choice between budgets and rolling forecasts conducted by Sandalgaard (2012), who concluded that there is no connection between environmental uncertainty and the abandonment of traditional annual budget in favor of rolling forecast and leaving open the question of why some companies use rolling forecasts as a budget alternative. Our study provides the evidence of how rolling forecasts are used as a substitute of traditional annual budget when uncertainty is high due to the early stage of development and radical innovations, when there is a need for a more frequent planning and forecasting and the importance of budgetary control is limited due to prevailed significance of intrinsic motivation and informal communication.

Moreover, the present study provides empirical examples of different roles of budget in different innovation strategies described by Davila (2005). Our findings corroborate the notion that the type and locus of innovation influence the design and function of formal management controls in the companies, and the managers need to be aware of different roles of budget dependent on the innovation strategy of the company and design their budgetary systems in accordance with the intended role. Further, our findings add to the study of Chiesa et al. (2009) regarding influence of radicalness of innovation on the management control systems and their evolvement along the innovation process, by providing additional notion that peculiarities of the innovation process stages can influence the design and use of overall budgetary system of the company. Thus, if a company mainly focuses on the new ideas generation stage, in which the role of budget is limited, and outsources other stages, this fact can influence the choice of budget alternative and its role in the company.

Additionally, the thesis contributes to a limited number of management control systems studies that have adopted organizational life cycle framework to analyze the approaches to designing and using budgets. This study provides an insight into the design and use of budget

across two different life cycle stages, particularly less formality and budget emphasis in the birth stage and more formality and interactive use of budget in the growth stage. Our findings suggest that that researchers and managers need to be aware of the particular context related to the specific life cycle stage and consider how multiple organizational factors influence management controls simultaneously when designing and using budgetary systems.

6.3 Limitations and avenues for future research

The above presented results reflect the information obtained from the empirical data of this research. However, we will acknowledge some limitations that were faced during the process of conducting this research that might have provided slightly different findings. Further, the limitations of this research are considered as avenues for future research.

The first limitation of this research is with regards to the size of the companies. All the analyzed companies in this research are small innovative firms. The presented results might have differed if one or two companies were big; this would have provided how both small and big innovative companies design and implement their budgets. The differences between the design and use in small companies would have been compared with big companies before arriving at the conclusion of the research. Future researches in this area can conduct a similar study but rather broaden the study to encompass both small and large companies in order to provide a comparison between big and small innovative companies regarding their design and use of budgeting.

Similar to the abovementioned limitation, all the analyzed entities are operating in the pharmaceutical industry. The results of this study might have been different if the companies operate in different industries. Prospective researchers in the area of budgeting and innovation can undertake a similar studies that will examine different industries to identify if there are other design choices available to innovative companies; and also how innovative companies from different industries make their choices in designing and implementing their budgeting systems.

Furthermore, this research evaluated budget as a management control system separately and not as a component of the package (Malmi & Brown, 2008). The focus on only budgeting system narrowed down the findings of this research; therefore it does not capture the relationship between innovation and the entire management control system package. Future researchers can extend this work by focusing on the entire management control package (Malmi & Brown, 2008) in order to identify if the different systems influence the design and use of budgeting in innovative companies; as well as how the systems supplement each other in the design of budgetary system.

Finally, the analyzed companies are in the early stages of organizational life cycle; birth and growth stages, whereas other stages are not captured by this study. Further research could incorporate the companies in their later stages of life cycle and examine how they design and use their budgetary systems. These findings could strengthen and complement our analysis of budgets with the help of organizational life cycle theory.

7. References

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Appendix 1: List of questions for the interview guide

Facts about the company

- Name of the company
- Year of foundation
- Number of employees
- Last year's turnover
- Industry

Budget for the overall company

- Is your company using traditional budgeting?
- If NO, what type of budgeting\ forecasting is your company using? Why?
- What is the budget/forecast setting process (period, top-down approach, involvement of departmental managers)? Why?
- How detailed is your budget/forecast designed?
- Is the budget/forecast revised within the financial year? Why?
- Do you analyze variances? If yes, how do you proceed with variances? Why?
- How is the budget/forecast used? What roles does your budget/forecast serve (planning, controlling etc.)?
- How do you measure your performance? Why?

Innovation

- What is your latest innovative product or services?
- When last did your company develop a new product or services?
- Have your company experienced any innovation that completely changed your business direction, strategy?
- Where does innovation take place in your company? Why?

Budgets and R&D activities

- How do you use budget\forecast for R&D activities? Why?
- Do you have different R&D projects? If yes, are they individually budgeted for?
- Who is responsible for allocating resources between projects or R&D activities and for individual stages of each project?

- What is the budget/forecast setting process for R&D (period, top-down approach, involvement of R&D manager)? Why?
- Is the R&D budget/forecast revised within the financial year? Why?