Overhead changes by implementing the DBC system

The effect of DBC implementation on hospital cost structure

Student	**S.R. Buitelaar MScBA**
Student number	**272282**
Date	**June 07**
Thesis coach	**Dr. V.M.F. Homburg**
1st Co – reader	**Dr. H.L. Klaassen**
Programme	**Public Administration**
Master	**Public Management**
University	**Erasmus University Rotterdam**

ERASMUS UNIVERSITEIT ROTTERDAM

Preface

During the master Public Management the writing process of the thesis has a strong focus. The first semester the concentration is on starting up the thesis process, by selecting a subject and finding an internship. For the second semester the main target is writing the thesis itself. Now the second semester is ending and also the thesis is finished, it is time to graduate and to start a working career.

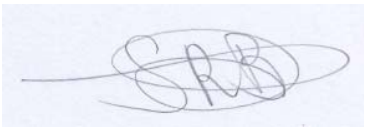
I want to take the opportunity to thank Drs. Patricia Soeteman and Henk de Wilde RA for their support and giving me the possibility to work on my master thesis at the Ernst & Young office in Den Haag. By working for this company I did not only have had the chance to use the knowledge from the company, but it also gave me the opportunity to get to know the workgroup. Furthermore I would like to thank the different hospital managers for their time and for sharing their knowledge during the interviews.

In addition I would like to thank my thesis coach Dr. V.M.F. Homburg for supporting me writing my thesis and giving advice whenever I needed it. Also thanks to Dr. H.L. Klaassen for co-reading my thesis.

Finally I would like to thank my family and friends for supporting me, not only during the writing of my thesis, but for supporting me throughout my studies.

In the last months I enjoyed working on this Master thesis, I also hope that you will enjoy reading it!

Kind Regards,



Sandra Buitelaar
June, 2007

Table of content

Table of Figures

Executive summary

In January 2005 the DBC system was introduced in the Dutch hospitals. The DBC system is the whole of activities and treatments of a hospital and the medical specialist starting from the health care demand by the patient. The DBC system is a market type mechanism to get the hospital sector more market oriented, influenced by New Public Management. The goal of introducing this system is to have a market orientated mechanism that renders more transparency and more awareness of the costs of the different products than the functional budgeting system, which is a lump sum budget. The DBC system is introduced to have better insight in the costs of products and the reimbursement. However it is important to see whether this also has a positive effect on the administration load as well or whether this is the contrary. This thesis focussed on the overhead to primary processes ratio, because Dutch policy makers have decided that there should be more attention and money to the primary processes and less to the overhead processes to create a tighter budget.

In order to define the ratio overhead and primary processes for the hospitals in the Netherlands, the following overhead definition is used: 'overhead costs are costs which are not results of a transaction of production of the certain product, or from management or capital investment.' By using Activity Based Costing the hospital organisation can determine the overhead costs by looking at the costs that can not be allocated to the activities of the operating process. So for defining the ratio, overhead needs to be calculated using the Activity based Costing model. However most of the hospitals do not use Activity based costing, but use direct, step-down or reciprocal allocation of overhead costs. This will lead to less transparency and more diffused strategies. Because of the introduction of the DBC system, the hospitals are pressed to calculate the different prices to have better insight in the costs of the primary processes and also overhead to calculate a cost price, to see what influences the result.
The results of using the framework to calculate the ratio between overhead and primary processes for 2004 or 2005, is that there was a total decrease of 1,0 % for the ratio overhead costs / primary costs and 0,5% decrease for the ratio overhead costs / total costs. When having a look at the data entered, the explanation for this decrease could be the high increase in costs for the primary processes. Many hospitals had high medicine costs and they also hired extra nursing personnel. The overhead costs grew as a total, but not that much as the primary costs.

Different implementation theories did help to explain the differences in implementation of the DBC system, but do not explain directly differences in the ratio overhead and primary processes, because this would take much more time. Looking at the rational choice theory, different hospitals which are similar should have consistent decision making given the same actions, preferences and options. However by having interviews I found out that all the different hospitals more similar or not, did decided differently how to implement the DBC system. Most of the hospitals did really put a lot of effort in the learning curve, not only by having contact persons to answer questions but also by doing training days and

information sessions. This costs a lot of money, but the real results will be seen in the future, hopefully. The differences in learning curve should explain the change in costs for the DBC system, because learning could lead to efficiency. There is a difference in interest between specialists and the managers, whereby managers is more driven by financial than clinical priorities. This is seen in the reports from interviews with the different managers. It made clear that the change to thinking more cost efficient is not transformed yet. The financial departments do see the need of calculating the cost prices and adjusting the business model to this, but the other divisions are not following yet. The hospitals are trying to change this by using incentives like; information, training and education, but also the treats of payment penalties to implement cost awareness into the whole organisation.

Chapter 1: Introduction

In this chapter of the thesis an introduction to the topic is given, followed by the explanation why this thesis is written and what the added value of this thesis is. In this chapter the problem statement is given and the research question is introduced as well, with the sub questions as outline for this thesis. The chapter also has a section on the research objectives and a short overview of the research design.

1.1 Background

The latest decades the Dutch politics is in motion of New Public Management, which applies to have more private management styles in the public sector (Hakvoort, 2004). An example of this kind of New Public Management is the introduction of market-driven mechanisms in the health care sector. The policy makers introduced more liberalisation, because of the fact that the costs of the health care in the Netherlands were rising (DBC onderhoud, 2006). Another reason is that in the latest decades the demand was higher then the supply, for that reason people had to wait for months until they were helped. Just as in several other countries, the policy makers in the Netherlands investigate the alternative financing methods of the health care system, like to have a market driven by demand (DBC onderhoud, 2006; Sulvetta, 1991). Another reason for introducing the DBC system is the vision of a more active role for consumers. But the greatest potential for a larger role for consumers lies in mechanisms that apply competitive pressure on providers to improve the quality of care that they provide and reduce their costs (Ginsburg, 2005).

In the past most hospitals were financed by a lump-sum budget (functional budgeting system), a consistent budget independent of the production. Some years ago, as a reaction to the waiting lists there was a transmission to a system of partly output financing, the budget was partly depending on the production of the hospital. The invoice system of the budget was based on prices set for the whole country by using different parameters, like number of operations and hospital visits (DBC onderhoud, 2006).

Since 1 January 2005 hospitals have been financed by the Diagnoses Treatment Combinations system (Diagnose Behandeling Combinaties, DBCs), this is a perspective payment system. The DBCs are product types of the different products which a hospital can deliver. For every speciality of a hospital there are multiple DBCs formulated and every DBCs exists of different parts of health care, like operation and days staying in the hospital, which are dependent of the kind of treatment and the previous chosen DBC (DBC onderhoud, 2006). At the beginning of the treatment, the specialist chooses the most suitable DBC. By ending the treatment the specialist determines if the correct DBC was chosen and if not, this will be changed. This ending DBC will be the basis for the invoice and the received budget.

At the time of implementing the DBC system two segments were created: the A and B segment. The A segment consists of complex and urgent treatments. In the B segment the more easy treatments are put, these are also the products which can be organised well. For the A segment products a nationwide compensation system is used and for the B segment hospitals need to negotiate with insurance companies on the stated prices. The different insurance companies are free to buy the treatments at every hospital, checking on price and quality. For this reason the hospitals are concerned to calculate the cost price of the treatments, so the hospitals know at which price they can sell (DBC onderhoud, 2006).

1.2 Motivation of research

From the first of February 2005 hospitals need to register the different DBCs for the B-segment and based on this they make the different invoices. The system used in the hospitals in the Netherlands, the DBC system, is very complex (Steinbusch, 2006). This complexity can lead to higher overhead costs, stated by Balakrishnan (1996) en MacArthur & Stanahan (1998). This could lead to the possible result that hospitals have more attention for the invoice procedures and less for the core business, the primary processes itself, like surgery. This would be contrary to the vision of the Dutch policy makers who have decided that there should be more attention and money to the primary processes and less to the overhead processes to create a tighter budget (Hoogervorst, 2006).

An example of this issue is a quote from the annual report of the Medisch Spectrum Twente, in this report is stated that during the year 2005 the hospitals had to improve the quality from the DBC registration. This worked because of the extra personnel effort by doing training days, and making more instruction policies for the administration. But also software support and a more periodic analysis of the results of the DBC registration and validation process helped improving the DBC invoicing quality. It was clear to them that the year 2005 has to been seen as transitional year for the DBC implementation costs (Medisch Spectrum Twente, 2006).

Another example is the Tweesteden ziekenhuis in Tilburg. They state in their annual report that the general costs rose because of the fact that the DBC ICT systems were expensive. There were also high license costs for the same system. In total amount of 200 000 euro was spent extra (Tweesteden ziekenhuis, 2006).

In line with this is the advice from commission de Beer (2002), which has stated that by digital communication and subsequent calculations, there would be a better connection with the control protocol. They state that hospitals should also process there annual reports digitally and integrate activities with the cost calculations and reports (Commissie-De Beer, 2002). With this research I will explore whether the administrative expenses are lower, as formulated in the policies of the coalition

agreement of Balkenende III or that the contrary happened and the overhead ratio is higher then the year before.

The company Berenschot did some analysis on the ratio overhead and primary processes before. However these ratios were calculated for other sectors, like the local governments and homecare, and those analyses were not specific orientated on one special moment in time, like the implementation of the DBC system (Huijben, 2003). This research could be an addition to their analysis.

At the moment the literature on case mix systems (referring to the collection of different types of patients, which are treated by a hospital) is formulated in the United States, there is the DRG (Diagnosis Related Groups) system introduced. On the American, German and Australian DRG system there is more literature available, but the literature on the Dutch DBC system is still lacking. This is because the system is only recently introduced in 2005 and because of the many differences with the DRG systems difficult to compare. This thesis could contribute to the debate on the DBC system (Steinbusch, 2006).

The literature available now on the DBC topic is mostly from the health care management perspective. There is still further research needed from the accounting perspective and this thesis is focussing on this field (Steinbusch, 2006; Poullier, 1992; Finkler, 2003).

In addition this research will not only focus on the results of the implementation of the DBC system, but also on how the implementation was executed by the different hospitals and how this affected the results of the implementation of the DBC system. This is done for instance by looking at the internal environment within the hospitals.

This thesis investigates if the ratio between overhead and primary processes is changed and how hospitals explain this different ratio. A possible explanation from the hospitals could be the implementation of the DBCs system, but also other explanations could be mentioned.

1.3 Problem statement

It is necessary to analyse the differences in the overhead and primary processes. Especially because the Dutch government states that money should saved because of a declining overhead, but at the same time the department introduces the DBC system what could lead to extra overhead costs. Research on the effect of this system on the overhead and primary processes could lead to a conclusion that the department implements contradictory policies. This thesis will focus on the ratio of overhead and primary processes and if this ratio is changed by introducing this new system.

1.4 Research objectives

This question will be answered by examining at the annual reports of Dutch hospitals of the years 2004 and 2005 with special attention to the change in ratio overhead and primary processes to determine the cost structure. To give an explanation for the change in cost structure several interviews will be held with hospital financial managers to document whether the change in structure is due to the implementation of the DBC system.

The goal of the research is first of all to give an analysis on the change in cost structure because of the introduction of the new reimbursement regulation. Another goal is to explain the change of the ratio overhead and primary processes by interviewing different hospital managers. But this thesis will also provide a framework, which can be used as a tool to calculate the ratio between the overhead and primary processes for other time spans. This framework is an addition to other frameworks which already exists. Another objective is to supplement the literature on the DBC system, because at this moment there is a limited amount of literature known on this Dutch case-mix system. The focus on this thesis is on the accounting aspect within the healthcare sector (Finkler, 2003).

1.5 Theoretical orientation

To answer the research question a literature review is done. Hereby the focus will be put at financial management theories and accounting literature. Examples are the Activity based costing theory and literature focussed on the influence of complexity on the overhead costs. There will also be attention for the literature on the DRG system. Another focus will be on implementation change theories, like the rational choice theory, social learning theory and the institutional theory, and extra focus to the internal environment. These theories can explain the differences in implementation of the DBC system by the hospitals. These different implementations could also lead and explain the different results of the hospitals. These theories could mostly answer the second part of the research question.

1.6 Research question

Main research question: *To what degree has the introduction of the DBC system affected the ratio overhead and primary processes of the hospitals in 2004 and 2005 and how can this be explained?*

This main question will be answered with help of the six different sub questions. These questions are focussed on the situation and the findings of the research and finally the conclusion and recommendations. These sub questions will also be the main outline for the thesis.

To answer the main research question several sub questions are stated as well. The first sub question I: 'What is the DBC system?' is a question that will explain the DBC system further and will give a broader introduction to the topic. The second and third sub questions are more focussed on a literature

review. The second sub question focuses on how the ratio overhead and primary processes can be calculated: 'How can the ratio overhead and primary processes in the hospitals in the Netherlands be defined?' The third sub question is more focussed on the expectation of the influence on the cost structure by the introduction of the DBC system: What are the expectations about the effect of the implementation of the DBC system on the ratio overhead and primary processes? The fourth and fifth questions are more concentrated on empirical research. Hereby the fourth question has the goal to calculate the different ratios by using the question: 'How is the ratio between overhead and primary processes changed from 2004 or 2005?' Question five is helping to explain the results of the ratio calculated in the question number four. This question has more attention for the role of implementation: 'What is the role of the implementation of the DBC system on the ratio overhead and primary processes in the reality?' The final research question will ask for a conclusion and recommendations: 'What recommendations can be stated based on the finding of this study?'

1.7 Method of research

For the empirical research of this thesis first a framework is developed by improving and combining different frameworks. The development of this framework used in this research is based on management accounting literature. The framework will be used, by calculating the ratio overhead compared to primary processes and compared to total costs. This ratio will be calculated for all the 97 hospitals in the Netherlands using the annual reports of 2004 and 2005. The hospitals in the Netherlands can be divided in three groups, University Medical Centres, Top clinical hospitals and general hospitals. The annual reports of these hospitals are provided on the site: www.jaarverslagen.nl. From the population 6 hospitals are chosen to have interviews with to do an in dept case research. By the selection of the hospital, the different groups are taken in to account. For every group there will be at least one hospital selected to interview. The hospitals chosen from the three groups are those who are the most far from the average ratio. I will use the database from Ernst & Young to get in contact with the financial managers of the hospitals to ask them for in interview. The information given by the interviews will be compared with each other. The methodology will be explained further in chapter 6.

1.8 Outline of the thesis

The outline followed for the thesis is the sub questions stated in the section before. The following chapter will give an introduction to the DBC system. Then a literature review will be given started with the focus on the how to calculate the ratio overhead compared to primary processes and then more literature on influence of the DBC system on the cost structure and what the explanations could be. The second part of the thesis will have attention for empirical research. First the research design and methodology will be explained, followed by the results of the calculations and ending with an analysis of the several interviews. The thesis will end with a conclusion and I will give some recommendations.

Chapter 2: Introduction of the DBC system

In this chapter an introduction is given on public management, where the health care sector is part of in the Netherlands. Then the previous system used in the Dutch health care explained; functional budgeting system. Followed by an introduction of the new DBC system and the advantages and disadvantages of this system are discussed as well. This chapter will give an answer to the first sub question: 'What is the DBC system?' The discussion of the different systems are needed because they are the main topic of this thesis and helpful for reading the thesis.

2.1 New public management

Since the 1980s governments are using New Public Management as a management philosophy to modernize the public sector. New public management is complex term used to describe the wave of public sector reforms since the 1980s. Based on public choice and managerial schools of thought new public management seeks to enhance the efficiency of the public sector and the control that government has over it. By marketizing the system and instituting as many market type mechanisms as possible within the system of administration and laws, public sector organizations are starting to compete with each other, in order to increase efficiency and user responsiveness (Pollitt, 2004).

NPM is oriented towards outcomes and efficiency through better management of public budget. It is considered to be achieved by applying competition, as it is known in the private sector, to organizations of public sector, emphasizing economic and leadership principles. New public management can be improved by implementing several market type mechanisms such as disaggregating (splitting large bureaucracies into smaller, more fragmented ones), competition and incentivization (more economic lines) (Dunleavy, 2006; Pollitt, 2004).

By introducing the DBC system the focus is on more competition in the health care sector. At the moment only the B segment is part of the negotiations between the hospital organizations and the insurance companies, but in the near future more and more products will be part of this B segment.

2.2 Functional budget system

Before 2005 the hospitals in the Netherlands used a lump-sum budget, also known as a functional budget system (FB). This system worked with a fixed budget independent of the production. The functional budget system was based on four parts (variable, semi fixed, fixed and location attached costs), which determined the budget given to the hospitals. On the variable part the hospitals had agreements on production, like days of nursery, number of hospitalizations, number of first visits to a medical specialist and the number of day nursery. The semi-fixed part was based on the number of beds and medical specialists. The fixed part was based on the market share of the hospital. The part of location attached costs was meant for interest and depreciation costs (DBC onderhoud, 2006).

In 2004 the system of functional budgeting was not in line with the goals of the Ministry of Health, Welfare and Sport, like the insights on the health care production and the costs of this. Another goal was to have a health care system that is focused on effectively and efficiency. The old functional budget system had almost no relation between the prices invoiced to insurance companies and the cost price of their products. The fixed and semi-fixed parts of the budget system were also not related to the production of the hospital and there was no stimulus to be more effective and innovative. A third point is that the old system does not provide the transparency that was needed (DBC onderhoud, 2006; Ministerie van Volksgezondheid, Welzijn en Sport, 2005).

2.3 Introduction of the DBC system

Starting January the first, 2005 the Dutch hospitals are financed by using the DBC system (Diagnose Behandeling Combinaties). A DBC is the whole of activities and treatments of a hospital and the medical specialist starting from the health care demand by the patient. DBCs are the product types of the different products which a hospital can deliver. Parts of this are medical and medical supportive treatments, like visits to the policlinic outpatients' department, number of nursing days and number of hospital day care. The DBC appoints every step in the treatment of the patient, from the first visit or examination till the last check up and every diagnosis is a different DBC. When the patient has its first visit with the medical specialist, a DBC is opened and this is closed by the last check up. Then the specialist monitors if the correct DBC is opened and if not, it still could be changed. The final DBC is the basis for the invoice and the budget. To determine the price of a DBC it is needed to follow the different steps the hospital has to make to treat the patient, like the work load and the time spent by a medical specialist. These costs together, the activities and treatments, determine the price of that DBC (Zuurbier, 2003; DBC onderhoud, 2006)

The main idea of implementing the DBC system is to improve transparency of the health care demand. By working with this system there would be more insight in the different activities of the hospitals. By having more transparency it is easier for hospitals to improve operational management and insurance companies could be more efficient by buying only from the most effective and efficient hospitals. Another advantage is that this system makes it possible to compare the performance of the hospitals better and on a nation level. This transparency is necessary to have a market regulated health care system. When this new DBC system is working better, the department will introduce more policies so the whole system is market regulated (Langwell, 1993). The main idea is that the hospitals will work with one central data base, which they can use for the necessary data, to improve planning and logistics and have a decrease in administrative costs (DBC onderhoud, 2006; Ministerie van Volksgezondheid, Welzijn en Sport, 2005).

Transparency of the health care supply and a regulated free market system has to have the effect that there would be a better match with apply and demand. This because of the reason that patients desire quality, variation and choice and it is the responsibility of the hospital and the insurance company to observe these needs and fulfil this to have more customers. There will be a change in responsibility from government to insurance companies and hospitals, to work most effective and efficient (DBC onderhoud, 2006).

By introducing the DBC system in January 2005 there was also a separation of two segments. The A segment is containing the DBCs which are more complex and the emergence. The second segment, the B segment is concerned with simple treatments. For the A segment the reimbursements are determined central, but for the reimbursements of the B segment the hospitals have to negotiate with the insurance companies what the prices will be. The insurance companies are free to buy the health care wherever they want, so they can choose the cheapest one, or the one with the best price and quality ratio. However, insurance companies should always have different geographical hospitals available for patients. For the negotiation it is important that hospitals calculate the cost prices of their products, so they know what they can ask for it, to make a profit (DBC onderhoud, 2006).

In these cost price calculations it is necessary to take all the costs in to account, the direct costs (personnel and materials), but also indirect costs (overhead). Central the prices are set which are cost effective for most of the hospitals; thought is of the different health care profiles and the cost prices. Hospitals can compare the set prices with their own cost prices to see if they are profitable or not (DBC onderhoud, 2006; Chan, 1993).

The advantages of the DBC system are that it creates more insight in the demand and the need for health care, so the supply could adjust better to this demand (Ramsey, 1994). Another advantage is that it leads to a more efficient operation, because the hospitals and specialist know what the costs of the different activities and treatments are. Because of the fact that hospitals have to calculate the prices of the DBC, they are more cost-conscious then before and than the specialist can decide better whether an activity or treatment is necessary. The system also improves management information, because the DBC system has more medical information like the different parts of a treatment and the times and costs linked to that (Finkler, 2003; Chan, 1993). With this information the hospital organisation can better plan the different personnel capacity. By using the database nationwide it is possible to see if a hospital is above or under average for some activities and can improve the necessary activities. Important is to make a complete DBC registration, before it was needed to pay special attention to the first visit to the specialist, now the whole process is important for receiving money for the treatment (DBC onderhoud, 2006).

The implementation of the system does have high requirements for the internal control of the hospitals. The administrative organisation and the planning & control department have to be reorganised to meet the requirements of the management teams. They still have to give the needed information, to signal problems on time and find solutions to these problems and monitor them, to have a healthy hospital organisation. This can be difficult, compared to the stability of the FB system (DBC onderhoud, 2006).

To have a good working DBC system it is required to have several new instruments, like a flexible budgeting where the hospital can see the relation between production and costs on the different departments and if these costs are justified or not. Another tool is fast and flexible management reports, which can be delivered any moment and for different levels. These reports should define the problems immediately and come up with measurements when possible. The last tool is tight planning & control cycles, with fast feedback and contribution possibilities of the person's affected and fast decision making on the different levels within the organisation. The problem is that these instruments could lead to an increase in overhead. Also the need of cost calculation could lead to higher overhead costs (Schaepkens, 2002; Finkler, 2003).

Another point is the framework for the administrative organisation and internal control which has been used since the first of January 2005 as well. This framework sets higher boundaries for the hospitals which they should pass definitely. This could also be a point where there could be made extra overhead costs (Project DBC, 2003). This new way of administrating the DBCs should lead to a better insight in the different products; this could lead to better operational management. Transparency is the most important reason of this new system. At the moment the registration of the DBCs will be next to the old registration system, but in a few years the normal administration and the DBC registration should be integrated and then a lot of administrative activities are redundant (DBC onderhoud, 2006).

2.4 Conclusion

The DBC system is the whole of activities and treatments of a hospital and the medical specialist starting from the health care demand by the patient. DBCs are the product types of the different products which a hospital can deliver. The DBC system is a market type mechanism to get the hospital sector more marktized, what influenced is by new public management. The goal of introducing this system is to have a market orientated mechanism that supplies more transparency and more awareness of the costs of the different products then the functional budgeting system, which is a lump sum budget. The DBC system is introduced to have better insight in the costs of the products and the reimbursement of the same product. An additional benefit is that by introducing the DBC system several information systems can be linked to each other.

Chapter 3: Ratio overhead and primary processes

In this third chapter the sub question: 'How can the ratio overhead and primary processes in the hospitals in the Netherlands be defined?' will be answered. Where the first two chapters gave an introduction to the topic, this chapter will give a literature review on the part of the ratio overhead and primary processes, which is necessary for empirical research later. First the definition of overhead will be determined and then different management accounting methods are introduced. Finally explained is how to calculate the ratio overhead and primary processes.

3.1 Definition overhead

The first step is to define overhead, because it is an important definition in the main research question of this thesis. To calculate the ratio overhead and primary processes it is helpful to know what both the definitions mean, before calculating. The definition of primary processes is those costs that are directly related to the operational process of the organisation. But the definition for overhead could be understood differently. The following definition could be used: Overhead costs are costs which are not results of a transaction of production of the certain product, or from management or capital investment. Here we see that overhead is stated as money that is used on the own organisation and not on the goals which are set by the organisation. Overhead costs are most of the time costs, which can not be assigned to the different products of services. Here for these costs can not be calculated to the output of the company, which will result in a less defined cost price (Kaplan, 1998; Bromwich, 1997; Ramsey, 1994). Another definition could be: 'Departments not providing patient care are called support cost centres. These involve departments for administration, personnel, billing, communications, finance, security etc. Costs of these departments can also be referred to as overheads. In the unit cost model, costs of all support cost centres are assigned to final cost centres using direct allocation' (Horngren 1982, p413). This means that the costs of support cost centres are assigned to the final cost centres using a weighting methodology, based on various 'allocation bases' (Finkler, 1999; Oostenbrink, 2006). Cost can be divided in two categories: direct costs and indirect costs. These two groups can be divided again in patient care, education and research for the direct costs and in administrative costs and other indirect costs. Most interesting is that, administrative costs can be divided in operational costs, payer related costs and regulatory costs (McKay, 2006).

3.2 Methods in Management Accounting

Management accounting is a discipline to determine overhead. This is useful for this research, because it gives insight in how the definition overhead can calculated by the different organisations and also how the costs of the overhead can be taken into the cost prices of the products. There are several management accounting methods which can be used to allocate indirect and overhead costs to activities and products to have a cost price calculated. If hospitals calculate the price of their products they will use the direct costs (Thorley, 1994) and most of them still are using mark ups to assign

overhead costs to the cost prices (Lewin, 1976; Lewin, 1981; Shukla, 1997; Thorley, 1994). Hereby the overhead costs are on average taken and spread to all the products in one time with a calculated percentage. This method is not precise on allocating the overhead costs to different products.

Activity Based Costing (ABC) is one of these methods which is more precise, because the costs are linked to activities and then to outputs. By using this method the indirect and overhead costs can be seen as direct costs and more useful to decrease the cost price (Kaplan, 1998; Bromwich, 1997). These management accounting methods underline the idea that the indirect and overhead costs can be divided so that they are direct costs. Indirect and overhead costs do actually not exist, but only not defined direct costs (Kaplan, 1998; Horngren, 2002). By using this method it is required to define the overhead and find an activity to fit with it. When organisations have difficulties to find the right activities the pricing could be less precise, and could lead to higher ratio overhead compared to primary processes.

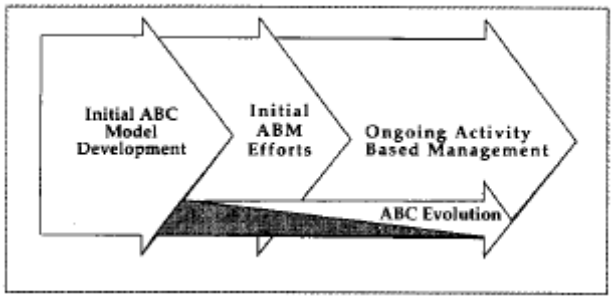
However from the management accounting perspective on overhead costs are that these costs are not flexible as well, because on short term these costs are fixed. But the output and the production volume can be changed in a way that the fixed costs can be spread among more activities or products (Horngren, 2002; Finkler, 2003). This could be useful to know when hospitals want to change the ratio overhead compared to primary processes, because on in small time limit this is not that easy to handle. Therefore hospitals need to have a long time planning to cut the overhead expenses.

At the moment most of the hospitals do not use Activity Based Costing, but more and more hospitals see the need of implementation of this accounting system. While previous research reports that hospitals are increasingly adopting costing methodologies, survey results indicate that costing systems and cost methodologies have not been widely implemented (Thorley, 1994). Only 26% routinely collect procedure-level costs and only 12% apply basic costing techniques described in prior health care management literature. It appears that despite cost accounting's benefits, immediate cost-control problems are answered with short-term focused cost-cutting solutions. While such short-term measures allow hospitals to survive in the current environment, health care reform and other pressures to control revenue growth will make sophisticated cost management a necessity for hospitals in the near future (Thorley, 1994). The 18 pilot hospitals used a production centre approach with direct, step-down or reciprocal allocation of overhead costs (Horngren, 1982; DeCoster et al, 1988; Latimer, 1995; Thorley, 1994) to determine the cost prices of intermediate products. In applying this approach the support or service cost centres are defined together with the cost allocation base to allocate their costs to the production centres. The production centres are also defined with their costing objects, the intermediate products. Ross (2004) argues that an Activity Based Costing approach provides better material for price setting strategies, quality issues and demand management, but the lack of experience

with cost accounting within the hospitals has lead to a relatively easy to maintain and understandable production centre approach. The advantage of this approach is that all the necessary information in terms of intermediate products and allocation bases is readily available (Zuurbier, 2006; Finkler, 2003). The use of the Activity Based Costing method is that it can help to improve transparency and can also help to calculate the cost prices for the products of the hospitals. Without a cost strategy hospitals are not able to see what they are best at. Therefore they can not choose which activities to continue and which activities to quit. By having a more focussed strategy the organisation can start eliminating extra fixed costs (Reinhardt, 1996).

After having information and action from implementing Activity Based management, the next step is also to have evolution from this to have an ongoing basis. The starting point is to create an ABC model and develop this to the organisation, and then the process of the organisation should be focussed on the system as well. In other words the management process should be concentrated on the Accounting Based Costing model as well. But for the long run ABC information will stagnate and loose much of its value, therefore it is needed to pay extra attention to accuracy, timeliness, and applicability to have an ongoing ABM success. ABM should add value at any moment in time for the organisation and to do this ABC evolution is needed (Anderson, 1995).

Table 2.1: Model ABC Evolution



Cost systems are based on a level of averaging or some kind of standard costs. The reason for research is to investigate of this form of compressing is valid. When there is a use of a better case mix, this will result in more valid average. Results indicate that cost weight compression can influence the cases in a hospital with a diverse case mix (Botz, 2006; Ramsey, 1994; Sulvetta, 1991; Finkler, 2003; Chan, 1993; Shukla, 1997). By using this system it is also needed to pay attention to the kind of hospital. For example the academic hospitals have other extra costs, because of their teaching activities (Sulvetta, 1991). This is useful for the research when comparing the different groups of hospitals, because when the reimbursement is different, the attention to allocation and to overhead could be different as well.

The reimbursement through the DBC system is based on average cost prices. Therefore it is necessary that a hospital has a lower cost price than average, because then there is a profit margin between the price given and the cost price of the hospitals. When the cost price is higher then the average cost prices, the results will be negative. The hospitals have to include also overhead in their cost prices to prevent themselves from having negative results at the end of the year (Ramsey, 1994; Sulvetta, 1991). For the reason of needing a cost price is the introduction of the DBC system the moment in time include the ABC system in the hospital administration also (Upda, 1996). At the moment most hospitals do not use a cost based system to price their products, they just knew the amount of the received budget (Thorley, 1994). For an optimal market oriented system it is needed for the hospitals to know the prices of their products. So by introducing the DBC system the hospitals are pressed to calculated the different prices to have better insight in the costs of the primary processes and also overhead to calculate a cost price.

3.3 Ratio overhead and primary processes

The empirical research of this thesis consists of the calculation of the ratio overhead compared to primary processes. Therefore it is needed to know how this calculation exactly works. Horngren (2002) describes two different formulas to calculate the overhead compared to the costs of the operational processes. The ratio overhead and primary processes is calculated by taking the total amount of overhead costs and divide this by the total amount of costs of the primary processes. The overhead ratio could also be calculated by taking the total amount of overhead costs and divide this by the total amount of costs (Horngren, 2002).

3.4 Conclusion

For defining the ratio overhead and primary processes in the hospitals in the Netherlands, it is needed to explain what is considered overhead in this research. Used can be the definition of Kaplan (1998), who stated that overhead costs are costs which are not results of a transaction of production of the certain product, or from management or capital investment.

By using Activity Based Costing the hospital organisation can determine the overhead costs by looking at the costs that can not be allocated to the activities of the operating process (Kaplan, 1998; Horngren, 2002). So for defining the ratio, overhead needs to be calculated using the Activity based Costing model. However most of the hospitals do not use Activity based costing (Thorley, 1994), but use direct, step-down or reciprocal allocation of overhead costs (Horngren, 1982). This will lead to less transparency and more diffused strategies (Reinhart, 1996; Zuurbier, 2006). Introducing ABC Evolution will resolve this; because this will give emphasize to have extra attention for accuracy, timeliness, and applicability (Anderson, 1995). Because of the introduction of the DBC system, the hospitals are pressed to calculate the different prices to have better insight in the costs of the primary

processes and also overhead to calculate a cost price, to see what influences the result (Ramsey, 1994, Sulvetta, 1991).

The ratio overhead and primary processes in the hospitals in the Netherlands can be defined by taking the total amount of overhead costs and divide this by the total amount of costs of the primary processes. The overhead ratio could also be calculated by taking the total amount of overhead costs and divide this by the total amount of costs (Horngren, 2002). The following chapter will focus on the variables that influence overhead and how the implementation influenced the introduction of the DBC system.

Chapter 4: Implementation of the DBC system and overhead

In chapter 4 the third sub question is answered: 'What are the expectations about the effect of the implementation of the DBC system on the ratio overhead and primary processes?' First different variables are discussed which influence overhead. This is important to the research, because when knowing what effect overhead this could be seen in the implementation of the DBC system as well. Then a comparison is made with the DRG system and there is more focus on implementation theories. Finally a proposition is formed to state the expected answer after doing theoretical research.

4.1 Influence on overhead

Eldenburg (2006) has written an article were he discussed different variables that influence overhead. This is important for this research, because some of the variables are also changing by implementing the DBC system in the Dutch health care system. By changing the variables via the DBC system this could lead to a different overhead rate as well. The variables used are volume, complexity and service intensity.

The change in overhead can be determined by the change in volume (Noreen & Soderstrom, 1994, 1997). By using data from hospitals in the state of Washington, Noreen and Soderstrom (1997) examined time-series behaviour of overhead costs. They found out that more accurate predictions of changes in costs are usually generated by assuming a cost will not change at all than by assuming that the cost will change in proportion to changes in activity. In addition they found that nearly all of the effect of a change in activity on costs appears to occur in the same year as the change in activity.

The research challenges the ABC assumption that costs are proportional to activities in the short term and find that the ratio of marginal cost to average cost (the coefficient on activity levels) is less than 1, indicating that there are increasing returns to scale. In a later study they analyze hospital cost structure across time using a proportional cost (ABC) model and find that only about 20 percent of the overhead costs are variable. In a related study shows that capacity utilization influences whether costs change proportionately with changes in activities. While the focus of the study is whether costs are sticky (i.e., the proportionality of cost to activity levels differs for increases versus decreases in activity), they also find that the proportionality of cost to changes in activity levels is different for hospitals experiencing either excess, normal, or strained capacity utilization (Eldenburg, 2006).

Hospital data have been used to determine non-traditional drivers of overhead costs. Balakrishnan et al (1996) developed a model representing hospitals as sets of concentric, interrelated services that are organized around the core mission of providing patient care. The authors predict that the complexity of operations as well as volume drive costs in this type of system. Using 1986 data from 165 acute care Canadian hospitals, they analyze cost behaviour in 18 different department-level cost pools, including

patient care, ancillary, and support departments. For each cost pool, they estimate six linear cost models using the following combination of cost drivers, volume alone, volume weighted by measures of complexity, volume and volume weighted by measures of complexity, volume and volume squared, volume and complexity as independent, additive explanatory variables and complexity alone. Their results suggest that adding a measure of complexity to the volume measure significantly improves explanatory power. The authors estimate that 42 to 50 percent of hospitals operating costs are affected by complexity of care. In addition, the relation between complexity of operations and costs varies by department (Balakrishnan et al, 1996; Upda, 1996; Maher & Marais, 1998; MacArthur & Stanahan, 1998; Balakrishnan et al, 2004; Eldenburg, 2006). Anderson (1995), Balakrishnan et al. (1996) and Banker and Johnston (1993) have also demonstrated that the effect of complexity on cost is there, especially in the healthcare setting.

Moreover, volume and complexity are interdependent, and cost drivers therefore need to incorporate interdependencies. In extend to this research and to examine two types of complexity: the number of services (breadth) and the intensity of individual of services (depth). The authors obtain data for 5,306 acute care hospitals from all regions of the US from the Health Care Financing Administration, HCFA, and find that volume and both types of complexity variables are significant drivers of overhead costs (MacArthur & Stanahan, 1998; Eldenburg, 2006).

These three studies provide evidence that a relatively high proportion of hospital costs appear to be fixed, and therefore do not change as activities change, and highlight the importance of recognizing and incorporating non-linearity in cost functions. Maher & Marais (1998) extend this literature and demonstrate that non-linear relations between total costs and activities also arise when activities are joint and indivisible. The authors use field data from an outpatient surgery facility in a non profit teaching hospital and contrast three types of models: a volume-based single-pool allocation system, linear activity-based costing, and integer programming. Their results indicate that linear activity based costing performs poorly when changes in user demands do not translate directly to changes in resource demands, because services are provided concurrently to multiple users. Thus, both conventional volume-based costing, and linear activity based costing do not provide good quality information for decision-making, especially when resources are provided on a joint or indivisible basis (Eldenburg, 2006).

Another point of increased (overhead) costs is patient satisfaction, where spill over effects could include schedule delays that lead to overtime and gate changes. To resent this is necessary to have strict procedures to decrease these extra costs (Balakrisnan et al, 1996). An economically efficient, welfare-maximizing pricing strategy will seek to recover relatively more overhead from item for which the demand is price-insensitive (price – inelastic) and relatively less from items for which the

demand is price-sensitive (price-elastic) (Reinhardt, 1996). Here for it is needed for the hospitals to see what products are price sensitive and which not, so they can decrease their overhead costs.

4.2 The difference between DRG and DBC system

This part of the thesis has the focus on the DRG system. The DRG (Diagnoses related group) is the case mix system used in other western countries implementing years before, more or less similar to the DBC system, therefore it can help explain differences in the ratio overhead and primary processes. Steinbusch (2006) makes a comparison between American and Australian DRG system and the Dutch DBC system in his article. He states that the strength of the Dutch system is related to the detailed classification scheme, using medically meaningful classification criteria. Nevertheless, the detailed classification scheme also causes a weakness, because of its increased complexity compared with the US and Australian system. It is recommended that researchers and policy makers carefully consider all relevant market, control and casemix characteristics when developing and restructuring casemix reimbursement systems (Steinbusch, 2006). Another difference between the Dutch system and the DRG systems is that the physicians have to register the DBCs, whereas in the US and Australian system this task has been delegated to official coders. The point in time of initial registration during the care process is for the DRG systems after discharge of the patient, for the DBC systems is this when the patient has its first visit to the medical specialist. Fort the DBC system changes after initial registration is possible. The DBC casemix system can distinguish four dimensions: the type of care, the demand for care, the diagnosis and the treatment axis (Steinbusch, 2006). By making this comparison it is seen that the DBC system is more complex than the DRG system. But the volume of the different DBCs is also higher then the different DRGs and also the allocation of the correct DBC is more intensive than working with the DRG system. Here fore all the three variables of the article of Eldenburg (2006) is mentioned.

Looking at the overhead costs after the introduction of the DRG system, could indicate the same trend in overhead cost after implementing the DBC system as well, because both systems have some similarities. Here fore it could be useful to analyse the overhead costs after implementing the DRG system. After the introduction of the DRG system in 1983 the costs for overhead tasks grew to 6 billion in 1988. After that the growth slowed down a bit, but still this amount is weighting heavily on the profit and loss account of the different hospitals. The article of Cromwell (1995) shows that the general overhead expenses raised with 15 percent from 1980 till 1992, the biggest part from this amount was the growth in administration costs. There was also a growth of 3,5 percent in the employment rate.

Also in the German hospitals the DRG system is introduced and these hospitals are willing to compare the individual case cost to the reimbursements and therefore are modernizing and updating the accounting system (Soderstrom et al, 2006). Eldenburg and Kallapur (1997) did research on the

fraction of total overhead cost allocated to outpatients before and after the implementation of the DRG system. They found out that the relative overhead rate was higher every year after the implementation of the DRG system. Prior the DRG implementation this was maximum 10 percent, but this has risen to 28 percent in 1991 (Eldenburg et al, 1997). But another point from there study in 2005 (Eldenburg et al, 2005) was that the variable cost portion of the function was changed after the DRG implementation; it was risen, mostly due to accounting method reasons (Soderstrom et al, 2006). And also in Germany the DRG system was implemented in an attempt to contain costs, but after the implementation the actually cost savings has never occurred (Eldenburg, 2000). But the positive fact was that the DRG system although controlled the costs better than the old system (ProPAC, 1992) (Soderstrom et al, 2006).

4.3 Implementation of the DBC system

To answer the question on the expectations about the effect of the implementation of the DBC system on the ratio overhead and primary processes, it is helpful to focus on the implementation as well. Because not every hospital implemented the system in the same way and this could lead to differences in the results of the hospitals. For that reason there will be focus how this influences the organisation and its direct environment as well. In this part of the thesis there will be attention on rational choice theories, social learning theory, and institutional theory and at last there is special attention for the internal environment, because this has an important role in the institutions within the hospitals. These topics will be tested by interviewing several hospitals in the empirical part of the thesis.

4.3.1 Rational choice theory

This theory postulates that an individual chooses the best action according to her preferences and the set of actions available to them. Rationality in rational choice theory does mean that the actions chosen by an individual are logically valid, or made with full or perfect information and refers to consistent decision making given the same actions, preferences, and options (Arrow, 1987).
A model used to work with the rational choice theory is the hard system model of change. For all the hospitals it is clear that the DBC system has to be implemented in the organisations, because the central government has decided this. Because of this clear definition of the problem and its solution, introducing the DBC system, the change can be modelled as a hard system. The hard system model of change has three phases: the description of the problem, the options and the implementation of the preferred option (Pateon, 2000; Senior, 2002).

The first two phases were exercised by the national government, but the implementation of the DBC system is up to the hospital organisations themselves. This could be a problem, because the persons, who created and have chosen the selected option, are not the persons who are implementing this. Of course different specialists and managers working in the field have given their advice, but they had to

think for all the different hospital organisations in the country. Another problem could be that the idea of this new system is pushed top down and is not thought of from within the organisations, here fore there could be lack of input from the organisations. And as a last point the organisations can be shocked because all of a sudden they have to implement this new system, but they did not have the change to define the problem and to choose between the options (Senior, 2002). These problems can occur during the implementation process, because in the first two phases the hospital organisations had no strong input.

By introducing the DBC system the hospital organisation has to change their behaviour as well. Before the hospitals received a budget and could spend this amount, but since the implementation of the DBC system in January 2005 the hospital does not only have to implement the new reimbursement, but also have to have more cost-effectiveness (Grizzell, 2003).

This is a change of behaviour and there are two theories linked to the implementation of the DBC system. Most theories were mechanical how the change should work in practice, like rational choice theory, whereby human behaviour is guided by instrumental reason for maximising utility (Sen, 1987). The first theory linked to the DBC system is the theory of reasoned action and theory of planned behaviour. Because hospitals knew the new system was going to be introduced the implementation was submitted in a limited amount of time. Here for the hospital organisations could plan the actions of implementing the system.

Successful organisations continuously adapt to changes in their environment, and proactively change their environment. These changes can influence the accounting systems twice: management accounting systems should help the organisation to change and management accounting systems can be part of the change itself (Atkinson, 1997). By helping to change, the system can provide the needed information like performance measures that reflect at what point the change is. A good information system can help the organisation to make necessary changes. For hospitals a basic form of having good information is introducing a cost price calculation system, like Activity Based Costing.

When the accounting system is part of the change then the system is used in a different way for example to have a new way of communicating. To have a change in behaviour of organisations from budget thinking to more cost-effective, a change in information system can help this process. So the DBC system can be seen as the information system that triggers more cost-effective thinking (Atkinson, 1997).

Starting from the rational choice theory hospitals which are more similar and having the same information would implement the DBC system in the same way. This theory could help explain why

the hospitals did or did not choose to implement the system in the same way. Looking at the hard system model the implementation done by the hospitals and the decision making process by the department has more focus. By using this theory the opinion of the hospitals on this decision making process has more scope.

4.3.2 Social learning theory

Another point is that the social environment of the hospital organisations has changed as well. The society is also focussed more on competition (Pollitt, 2004). Here for the norm of hospital reimbursement was changed to more cost-effectiveness, and the organisation could live up to the norm more easily. For the hospitals it was needed to take actions in changing, because this was necessary to survive in the sector (Grizzell, 2003).

An important objective of the reform is to increase the competition between hospitals. Here for it is necessary to have precise knowledge of its own average product costs compared to the relevant reimbursement rate and a close competitor' respective costs is obviously essential for its economic survival under the new system. What appears likely is that both organisational and individual learning will play an important role in this context of changing from system. However, a learning phenomenon raises the important question of cost dynamics and cost planning for surgical procedures, which is now neglected in the hospital management and hospital cost accounting literature following Ernst and Szczesny (2005).

Another behaviour change theory is social learning, which proposes that behaviour change is affected by environmental influences, personal factors, and attributes of the behaviour itself. Since established accounting routines are part of the organizational memory, any theory of management accounting change is likely to involve aspects of organizational learning. Change implies that the organization must unlearn or forget some routines while learning new ones. Unlearning is a stepwise process: a higher level of learning replaces a lower level which is stored in organization's memory (Hedberg, 1981: Starbuck et al., 1987). The desire to avoid an unspecified organizational crisis induces organizations to unlearn and climb up the learning ladder. Ultimately, needed is contextual learning within accounting routines, important factors should be innovation, innovation process management, and learning trajectories, path dependent build up of sustainable advantage (Cohen and Levinthal, 1990; Van de Ven et al, 1989; Schroeder and Van de Ven, 1989; van de Ven, 1986). Hereby management accounting research in learning should also give profitably incorporate insights from several methodological approaches in sociology (Van de Ven, 1992) (Atkinson, 1997).

Hereby the organisation must believe in its capability to perform the behaviour and must perceive an incentive to do so. This incentive is the received reimbursement that the organisation will receive for

the products. Additionally, the organisation must value the outcomes or consequences that will occur as a result of performing a specific behaviour or action. Outcomes may be classified as having immediate benefits or long-term benefits (Grizzell, 2003). For the hospital organisations it is required to act, because otherwise they will not receive reimbursements or budgets.

Hereby action of implementing the DBC is needed to operate in the sector. But the changes in thinking by the employees of the organisations are also needed to stay linked to the norm and to operate more cost-efficient. Here for the management of the hospital organisation has to create incentives for the employees to make this change, especially because of the implementation of the DBC system was a change of an external party and not a change from within (Grizzell, 2003). An example for this is that hospitals pursued a host of strategies to a line the interests of their medical staffs more closely with their own. This could be done by giving medical specialist own parts of the hospital organisations where they work at. But to let this structure work well most of the organizations created additional system to take care of the overhead because most of the parts of the hospital organisations did not achieve enough to pay the additional overhead (Ginsburg, 2005). Also non-financial measure as incentive can be useful to get change in the organisation (Atkinson, 1997).

The social learning theory helps understand the differences in learning curve by the hospitals, what leads to different efficiency rates in the near future. The hospitals have different forms of using learning tools to improve the organisation, what lead to different learning curves. Using this theory the different tools can be seen.

4.3.3 Institutional theory

Part of the behaviour change model focuses more on the environment of the organisations and their relation with government organisations. The hospital organisations are also part of a broader environment and have to operate within this environment. The theory that focuses on institutions that operate in an environment consisting of other institutions is new institutionalism. Every institution is influenced by the broader environment. In this environment, the main goal of organizations is to survive (Hall, 1993; 1996). This is also seen in the studies of Eldenburg and Soderstrom (1996), because the conclusion was that the hospitals responded to the new DRG system was affected by many aspects of the institutional setting and some interactions (Soderstrom et al, 2006).

The theory on new institutionalism focuses on the pervasive influence of institutions on human behaviour through rules, norms, and other frameworks. Previous theories held that institutions can influence individuals to act in one of two ways: they can cause individuals within institutions to maximize benefits (regulative institutions), similar to rational choice theory or to act out of duty or an awareness of what one is supposed to do (normative institutions) (Hall, 1993; 1996) and social

environment focuses more on cost containment (Eldenburg, 1994). An important contribution of new institutionalism was to add a cognitive type influence. This perspective adds that, instead of acting under rules or based on obligation, individuals act because of conception. Compliance occurs in many circumstances because other types of behaviour are inconceivable; routines are followed because they are taken for granted as 'the way we do these things' (Scott 2001). Individuals make certain choices or perform certain actions not because they fear punishment or attempting to conform, and not because an action is appropriate or the individual feels some sort of social obligation. Instead, the cognitive element of new institutionalism suggests that individuals make certain choices because they can conceive of no alternative. Another point is that organisations act, because of the choices they made before and they are depending on this now, also known as the path dependency (Pierson, 2002). New institutionalism was born out of a reaction to the 'behavioural revolution' (DiMaggio et al, 1983; DiMaggio et al, 1991).

DiMaggio and Powell (1991) identified three mechanisms through which the pressure toward homogenization is exerted. Coercive isomorphism stems from formal and informal pressures for compliance. The pressures exerted can be highly visible, formal, and forceful rules that will provide information with listings and scores to the top. In contrast the pressures can be relatively invisible, informal, and subtle, but no less powerful. Mimetic isomorphism occurs when one educational organization consciously models itself after another that it believes to represent a higher level of success and achievement in the public eye. This form of isomorphism focuses on the effect that different organisation, like hospitals copy each other to be part of this educational group and will improve it further. Normative isomorphism is rooted in the processes of professionalization in which the values, codes, and standards are imposed by universities as well as professional certification and accreditation agencies. These agencies also act as gatekeepers, determining who gets into the profession and therefore further reinforcing normative expectations and order on the behaviour of teachers and administrators (DiMaggio, 1991). DiMaggio (1983) also introduced de-coupling, to define organisations which are operating different changes only in the formal matter, but in the informal way the organisation lacks to use the change in function.

Covaleski (1993) uses the institutional perspective to extend this conceptualization of case-mix accounting systems. The institutional perspective proposes that many elements of organizational structure, like case-mix accounting systems, reflect as much a need to conform to societal expectations of acceptable practice as the technical imperative of fostering rationality. This article also extends institutional theory regarding the issues of power and decoupling by considering institutionalization to be an unfinished process in the health-care context, where the active agency of individuals and organizations is subjected to systematic examination. In this specific context, case-mix accounting may play a significant role in establishing and perpetuating — not merely supporting — the very

social structure of legitimacy, and may consequently be considered an interest-oriented activity having the potential to penetrate and alter the internal operating processes of financially strained hospitals.

Alexander and Scott (1984) state in their article that increasing regulation of hospitals would result in a more institutional environment and, thus, more institutional internal structures. Because of the fact that hospital organisations are part of the institutional environmental, they have to rearrange their institutions because of the implementation of the DBC system. The implementation of this system is not a change from within the hospital organisational institution, but from another institution. Here for the implementation could lead to problems, because the hospital organisational institution has to change for this.

The institutional theory can help doing this research by evaluation the hospital implementation. The reasoning behind the implementation is important here. Did the hospitals implement the DBC system, in the line of the way they did thing before in the hospitals, or because other hospitals are doing the same or because they followed the formal rules. The institutional theory focuses more on the reasoning of the hospitals doing the implementation.

4.3.4 Internal environment

To implement the DBC system the correct way there should also be attention for the internal environment, because this will effect the institutions within the hospital. In this part of the section on implementation, the focus will be on the relationship between the doctors and the managers, because they had to co-operate by implementing the DBC system. The managers were responsible for setting up the system and are responsible for keeping it running, while the specialists need to enter the data.

The article of Rundall et al (2004) focuses on the relationships between doctors and hospitals managers and why these relationships are constrained. For their research they mainly focussed on the survey data from the United States and the United Kingdom. A very high proportion of the respondents identified external factors, like governmental budget cuts, pressure from third parties to increase physicians' workload, and the turbulence of the policy environment as important barriers to improving doctor-manger relations (Rundall, 2004). This research showed that the respondents were more likely to believe that hospital management is driven by financial than clinical priorities. This could be improved by having more transparency in decision making (Rundall, 2004). DeJohn (1999) suggest that managers form an alliance with the physicians to have a have less compliance problems implementing standardization from the top down.

Scholten and van der Grinten (1998) analyze the way hospital organization models handle the relationship between medical specialists and hospital management in the Netherlands. The precarious

balance of power in hospitals was shifted with the introduction of a conflict of interest between the hospital itself and the medical specialists. Hospital management had a say in the control of costs while the independent medical specialists, as previously, were paid fees for service. The stimulus to produce more, inherent in the former system, is in conflict with the incentive to control hospital costs (Scholten, 1998).

From the hospital's point of view the position of the medical specialists is, according to formal rules, subject to hospital management. The medical staff will, nonetheless, retain the right to control overall medical policy, current and future patient care and the furtherance of medical expertise. The development of professional management in the classical sense (the boss, top-down, not connected with the primary process, etc.) is stagnating, whereby the medical specialists are integrated in the hospital organisation by formally subordinating them to the hospital management. The scenario in which the integration of medical specialists and hospital is given form by means of hierarchical subordination is slowly losing any chance of survival (Scholten, 1998).

However, recently a new model has come to the fore - the 'co-makership' - in which the hospital management and the medical specialists are assigned a position alongside each other. The still-existing combination of the general acceptance of key values provides a natural basis for a substantial role by professional management in Dutch health care (Scholten, 1998). Key values are such as broad accessibility, high quality and global efficiency of health care, within a system of private initiative, social entrepreneurship and a tendency to look for practical solutions (Scholten, 1998). However managers should be aware that possible pragmatic solutions in hospitals might easily be overshadowed because of conflicts of interest at national level (Ong et al., 1997).

The internal environment could explain important differences between different (kinds) of hospitals. Hospitals with more focus on clinical priorities could implement the DBC system differently than the hospitals mainly focussing on financial priorities. By looking at the different internal environments within the hospitals differences in financial outcomes could be explained.

4.3.5 Focus on implementation

In this part of the thesis different kind of theories are discussed are helpful to understand the changes in the hospital environment. The different theories help to explain the change in the ratio overhead and primary processes, but also the difference in ratio between the different hospitals. The hard system model (Senior, 2002), the theory of reasoned action and theory of planned behaviour (Atkinson, 1997) are based on a rational choice theory (Arrow, 1987). Hereby the benefits and the costs are analysed, while in the other theories more environmental elements are added. This theory gives us insight whether hospitals have consistent decision making given the same actions, preferences and options. The

question is whether they make choices based on information and whether every hospital makes the same choices if they are similar.

To improve the operations to have a better result at the end social learning is necessary, so organisations can learn from themselves and can improve (Grizzell, 2003). After the introduction of the DBC system, the hospital did now have two years to work with the system. Social learning theory can explain the difference at hospitals how they handled the implementation since the introduction. These differences in learning curve could explain the change in costs for the DBC system, because learning could lead to efficiency (Cohen and Levinthal, 1990).

But by implementing a new system like the DBC system, it is necessary to create an environment where the regulation and the norm are suiting the implementation, but the change should also be nature within the organisation. Further the focus will be on the institutional theory, to see if parts of the organisations are more cost effective driven, or that the whole organisation is. Institutional theories are helpful for this thesis, because it can explain why hospitals operate like they do, just because it is the way we do these things, or because of normative and official rules. These changes could explain differences between the different ratios overhead and primary processes and the differences in implementation of the system (DiMaggio, 1991). The institutional perspective proposes that many elements of organizational structure, like case-mix accounting systems, reflect as much a need to conform to societal expectations of acceptable practice as the technical imperative of fostering rationality (Covaleski 1993).

The internal environment is influenced by balance of power in hospitals, which was shifted with the introduction of a conflict of interest between the hospital itself and the medical specialists. Hospital management had a say in the control of costs while the independent medical specialists could act in conflict with the incentive to control hospital costs (Scholten, 1998). This is also seen in the reactions of the respondents, who were more likely to believe that hospital management is driven by financial than clinical priorities. This could be improved by having more transparency in decision making (Rundall, 2004). But also the introduction of ‘co-makership’ - in which the hospital management and the medical specialists are assigned a position alongside each other, could help. Hereby it is necessary to keep the focus on the still-existing combination of the general acceptance of key values such as broad accessibility, high quality and global efficiency of health care, within a system of private initiative, social entrepreneurship and a tendency to look for practical solutions (Scholten, 1998).

4.4 Use of theories in empirical research

When working with the different theories different questions come to mind, how to uses this information for the empirical research. For this research questions are formulated to use for the qualitative research (Table A.7). The questions (Table A.7) can be grouped in three categories;

implementation of the DBC system, the overhead costs and the overhead costs compared to the primary costs.

The first group contains questions about overhead costs. After calculating the overhead using the framework, which is based on the presented literature on management accounting, it is needed to compare these calculations with the ideas of the managers of the hospitals on these calculations. These questions mainly focus on confirmation of the amount of overhead and whether this is in line with the literature on management accounting. These are questions whether the overhead costs decreased and if the reason is the implementation of the DBC system, or are other factors the reason for the change in overhead. In the table A.8 the results of the interview are presented. In this table the key points display the differences for the cost for implementation of the DBC system, the extra overhead costs, extra overhead costs for implementation DBC system and other explanations for change costs.

The second group contains questions on the ratio overhead and primary processes. These questions are also created to see whether managers have the same feelings about the change in ratio, then the calculations are showing and is basically used as verification. These calculations are made based on the management accounting literature. The questions concentrate on the fact whether the primary costs also been changing in the same direction and amount as the overhead costs. In table A.8 two key points are used to explain the second group; overhead costs compared to the primary costs and overhead costs compared to the primary costs because of the implementation of the DBC system.

For the last and third group the questions are focused on the implementation of the DBC system. The questions of the interview are not used as confirmation, but to receive answers to set up an analysis on the different implementation theories. To see whether the hospitals had the same response on the implementation of the DBC system and on the fact that the implementation was top down, the following key points are used: were there clear goals for the DBC system, and whether the basic conditions met and the last point is of the organisation felt like the implementation is started top down. To see whether the hospitals could easily influence the DBC system and where able to change the system as well, the following key point is used: is it possible to make change to the system. To see how the hospitals motivated their employees to learn and to make changes the following questions are asked: Was it easy to implement the system throughout the whole organisation, with support of the different organisational levels? Did the organisation created incentives, like training days, for the employees at the different organisational levels? Did this work well? The institutions within a hospital can change be the implementation of the DBC system, therefore the following question was asked: ‘Is the implementation of the DBC system in line with other goals set by the organisation? And how is this for the sector? Why did this change happen? What was the cause for the introduction of the DBC system? Are there reasons from within the organisation?’ To see whether the hospitals are

mimetic, the question: 'During the DBC system implementation, did the organisation focussed more on the internal organisation, or did the organisation also had a close look at the other organisations within the sector?' is asked. At last there is focus on the cost awareness of the different departments within the hospital and if there are different institutions within the internal environment. To find out whether the hospitals are aware of cost efficiency the following question is asked: 'Are the institutions within the organisation changed because of the implementation of the DBC system? Is there more focus on cost efficient thinking?'

To find out whether the DBC systems is influencing the overhead by being more complex and service orientated, like the article of Eldenburg (2006) suggests, the following questions are formulated: Is the DBC system more complex then the functional budget system? Are there more possibilities to choose from and is the level of difficulty higher? And is the DBC system more focused on service compared to the functional budget system?

4.5 Proposition

Based on the theory used in this chapter the following proposition can answer the main research question: 'What is the effect of DBC implementation on a hospital cost structure?' A change of the ratio overhead and primary processes in the annual reports of the hospitals in 2004 and 2005 is expected, because in the start of the year 2005 the DBC system is introduced. We expect that the cost structure has more overhead compared to the primary processes because of the introduction of the DBC system.

This new system is more complex than the old functional budgeting system and also more complex then the DRG system. Higher rates of complexity will lead to higher overhead costs (Balakrishan, 1996). Other variables which could influence the overhead costs could be volume and service intensity (Eldenburg, 2006). So when the DBC system has higher values of these variables then the functional budgeting system, this could increase the overhead. This is also seen in the United States, where the overhead costs rose after implementing the DRG system (Cromwell, 1995). And also in Germany the DRG system was implemented in an attempt to contain costs, but after the implementation the actually cost savings has never occurred (Eldenburg, 2000). For the DBC system, a more complex system (Steinbusch, 2006), this could lead to higher overhead costs as well.

Another reason for higher overhead costs is that for the use of the system it is needed to calculate the cost price for every product. This process will need additional financial input (DBC onderhoud, 2006). By calculating the cost price the hospitals also need to calculate the overhead per product and use this in the cost price (Ramsey, 1994, Sulvetta, 1991). Most hospitals will use the Activity Based Costing system for this. However the hospitals will not be able to define every part of the overhead. The

differences in the percentages of the allocation of overhead per organisation can define the differences in the ratio overhead and primary processes as well. The overhead could also be increased because of the introduction of the electronic patient files and the extra attention for corporate governance.

Different implementation theories could help explain the differences in implementation of the DBC system, but also the differences in the ratio overhead and primary processes. The rational choice theory gives us insight whether hospitals have consistent decision making given the same actions, preferences and options (Arrow, 1987). The question is whether they make choices based on information and whether every hospital makes the same choices if they are a like. The differences in learning curve could explain the change in costs for the DBC system, because learning could lead to efficiency. This addition is given by the social learning theory (Cohen and Levinthal, 1990). Institutional theories are helpful for this thesis, because it can explain why hospitals operate like they do, just because it is the way we do these things, or because of normative and official rules (DiMaggio, 1991). The institutional perspective proposes also that that many elements of organizational structure, like case-mix accounting systems, reflect as much a need to conform to societal expectations of acceptable practice as the technical imperative of fostering rationality (Covaleski 1993).

In the internal environment there is a conflict of interest between the hospital itself and the medical specialists. Hospital management had a say in the control of costs while the independent medical specialists, had the stimulus to produce more (Scholten, 1998). This is also seen in the reactions of the respondents, who were more likely to believe that hospital management is driven by financial than clinical priorities. This could be improved by having more transparency in decision making (Rundall, 2004) or by the introduction of ‘co-makership’ (Scholten, 1998).

Chapter 5: Introduction to the framework

First there will be an overview on literature how other organisations determined the ratio overhead and primary processes. Important is not only to look at the percent what is seen as outcome, but also how they came to this answer. The second part of this chapter focuses on the choices I made to come to this new framework and how this differs to the previews ones.

5.1 Ratio calculated by other organisations' framework

By analysing the overhead in the public sector there should always be attention for the organisation itself but also the time frame and not per definition between different governmental institutions (Snibbe, 2006). Second the ratio overhead is not explaining the performance alone, also other elements are important in this (Snibbe, 2006). When making a new framework it is good to see what kinds of frameworks are already used and what the results of these calculations were. By doing research on the frameworks used by other organisations also the advantages and disadvantages are analysed.

5.1.1 Commission De Beer

In 2004 the NVZ, the Dutch association for hospitals signed a performance contract with the health care insurance association (ZN) on improvements on appropriateness. In this contract they made an agreement to decrease the administrative burden. And also the department felt committed to make arrangements to decrease the administrative burden. For that reason they used the measurements of commission De Beer, and stated that these have to be implemented before 2007. At the same time they made an agreement that new policies can not lead to more administrative rules (Ministerie Volksgezondheid, Welzijn en Sport, 2004).

Commission De Beer has introduced a policy, which has to take care of a decrease or at least not an increase of the administrative burden. That means that they had a look at the existent rules, and they advised when those were not necessary to delete them. Also double agreements should be deleted and the new set of rules should be logical. In total an amount of 3000 million euro could be saved on a total of the 1 billion euro spent on the administrative burden. The advice of the commission is received by the ministry of Health, Welfare and Sports and the minister promised to implement the findings.

Also in the report 'Sneller Beter' is stated that in the Netherlands the high costs for the health care system can be explained by a number of inefficiencies in the Dutch health care system. Like the low profitability of beds and the high overhead costs of 30% of the employed people in the sector, this is still growing (Sneller Beter, 2006).

5.1.2 CBS

In May 2006 the department reacted on the increase of managers in the health care sector, which was two times higher then the increase in nursing staff, given by CBS, the central bureau for statistics. CBS stated that there was in increase in overhead for the General hospitals. From 1997 till 2004 the number of general and administrative jobs increased with 5000 full time jobs. The jobs mentioned are those who do not have a direct link with patient health care, but these people are concerned with administration, automation, education and organisation. This group can have an effect contribution on quality of the health care sector, but are not per definition managers. In 2004 were 21.340 jobs general and administrative on the total of 125.000 jobs that is 17 % in total. In 1997 was this percentage 15%. However the best balance between supportive and primary jobs is not given (Hoogervorst, 2006; CBS, 2006).

5.1.3 Berenschot

In 2006 dhr Huijben published an article for Berenschot that there is almost no link between the size and the quality of the organisations in the public sector. Most of the time quality is mentioned to explain the difference between the amounts on overhead. In this article it is stated that overhead can be defined as jobs which are focussed on supporting the primary process. The two major positions are management and support staff. In his research the comparison was made in total amount of permanent functions, salary costs, housing costs and material costs. For 2004 and 2005 the ratio is 13, 9 percent in the nursing and care sector (Huijben, 2006).

5.1.4 Report 'Tussen bureau and bed'

In the report 'Tussen bureau and bed' the ratio of 20% of the personnel costs are overhead costs. Also marked is that the General hospitals have a systematically higher exploitation of staff and administration, however these costs are only 1% of the total amount spent. But these costs are at expense of the primary personnel. To lower the amount of money spent on the extra exploitation could work beneficial, but the advice is to study this with a benchmark. Important is to mention that the technical exploitation could be lower and that there still is a possibility to cut this down without losing quality. The report also concludes that when General hospitals have a bigger size, it is easier to cut down on personnel, especially on paramedical staff and supporting staff functions, however administrative staff will not decrease, because they are linked to the number of patients (Ecorys-Nei, 2002).

Table 5.1: Average costs overhead for hospitals 1993-2000

Figuur s1 Gemiddelde kostenaandelen overhead ziekenhuizen, 1993-2000

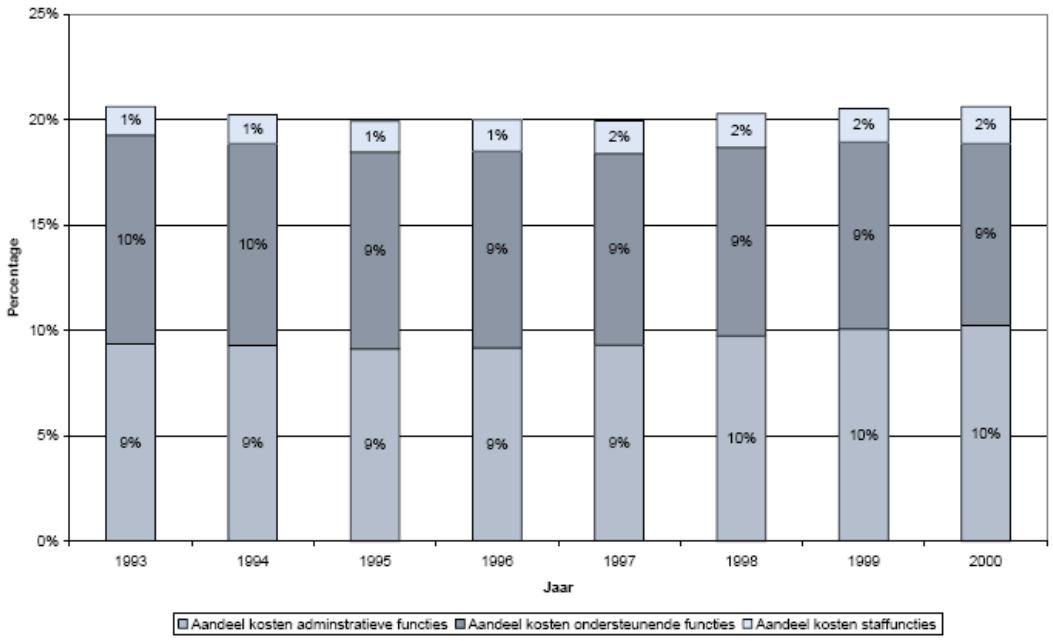
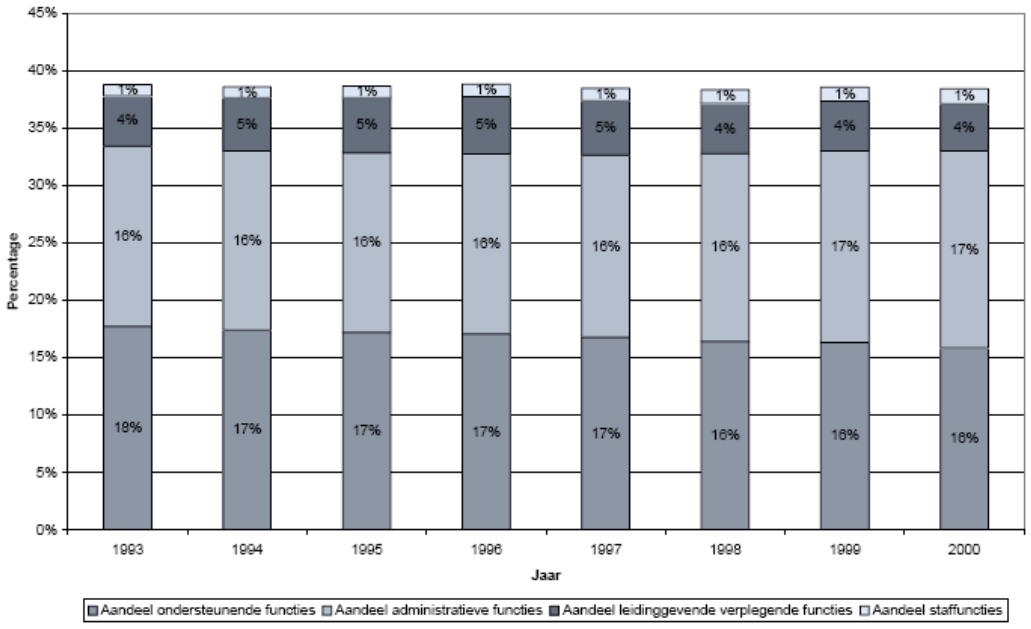


Table 5.2: Average personnel costs overhead hospitals 1993-2000

Figuur 1.3 Gemiddelde personeelsaandelen overhead ziekenhuizen, 1993-2000 (in voltijdbanen)



Looking at the total amount of permanent functions then is 38 percent of the personnel part of overhead. 17 percent of the personnel are working at the administration department en and also 17 percent is support staff. About one percent is staff and 4 percent has a management function in the nursing staff. The share of support staff and the nursing staff is decreased about 2 percent and the

administration department is increased a bit. In this research the personnel costs are 66 percent of the total amount of overhead costs and 33 percent are material costs.

5.1.5 Ministerie van Volksgezondheid, Welzijn en Sport

Dhr Bomhoff indicates in the positioning paper on General hospitals that on average 20 percent of the total costs of hospitals (excluding capital costs) are spent on overhead, meaning staff, administration and support as part of overhead. The variance is 16 till 24 percent. The opinion of Dhr Bomhoff is that there should be more openness around the financial state of the hospitals, with the effect that insurance companies can anticipate on that and ask for better performances (Bomhoff, 2002).

The department of healthcare, welfare and sports did some research on the administrative costs in combination with the introduction of the DBC system. The department claims that the ICT system has to be rearranged for the DBC system, that this is the right moment for hospitals to reorganise the whole administration system. The implementation is the chance to link the different administrative systems to one, just like the electronic patient file system (Ministerie van Volksgezondheid, Welzijn en Sport, 2005).

The implementation of the DBC system is concerned with a lot of changes in the administrative process. Here for the incidental costs in time but also money are relative high and the whole ICT system has to be up date. However by making this policy the department tried to limit these extra costs as much as possible. The department also advices to use the DBC data as much as possible, and have the most advantage out of them by using the data with links to other systems. The department want to control this process from close by and therefore it wants hospitals to stick with following the framework for the administrative organisation and internal control (Ministerie van Volksgezondheid, Welzijn en Sport, 2005).

Another debit is that the hospital are obligated to sent a minimum data set to the DIS, the DBC Information System, this system is concerned with making an efficient information system to and from hospitals. To send the data hospitals have to install software, buy the licence and also buy updates. The incidental costs are 42,3 million euro and the structural costs are 9,5 million for the licence updates (Ministerie van Volksgezondheid, Welzijn en Sport, 2005).

The costs made by hospitals for introducing the DBC system are considerably, and still new costs have to be made. But some of these costs can not only be allocated to the DBC system, because in the meantime other investments are made. The total of the administrative burden of the hospitals till 2006 is estimated on 116, 8 million. There is also 80.000 hour of extra work spent for explaining and recalculating invoices for patients (Ministerie van Volksgezondheid, Welzijn en Sport, 2005).

After completing the introduction and solving some start up mistakes there should be a positive structural effect on the administrative burden. Expected is that this will happen from 2007 on. However the administrative cost of 21, 9 million has to be calculated for the data information for DIS, for maintaining the framework for the administrative organisation and internal control and the software licences (Ministerie van Volksgezondheid, Welzijn en Sport, 2005).

5.2 The framework used this research

In this paragraph the reasoning beyond the framework is explained, but the framework itself is also made clearer, by looking at the different sub divisions.

5.2.1 Reasons to make a new framework

Because of the fact that frameworks used by other organisations do not include all the different cost aspects and that the calculation is not done for the sector just for hospitals, but most of the time generalised for different sectors, I decided to create a new framework. This framework is focussed just on the hospital sector and takes all the different costs factors in to account.

In the framework of Berenschot the different cost functions are taken into account like the total amount of permanent functions, salary costs, housing costs and material costs (Huijben, 2006). But the disadvantage of this framework is that it is not created especially for the organisation type. The framework is also not implemented in the hospital sector, but in other non-profit sectors.

In the report 'Tussen bureau and bed' there was a framework focused on the health care and hospital sector (Ecorys-Nei, 2002). Only the downside of this framework was that it only on special cost parts of the organisation, like personnel costs. It does not take all the different costs in to account.

5.2.2 Introduction to the framework

The framework I developed and used is seen in Table 1 in the appendix of this thesis (Table A.1). By looking at the overhead costs and the primary costs as it is stated in the research question, it is necessary to analyse the profit and loss account of the annual reports of the hospitals, because there are the costs explained.

At first the framework is divided in three different parts: personnel costs, depreciation costs and other operating costs. This division is seen in most of the annual reports of the hospitals as well. The subdivision Personnel costs is where all the costs related to personnel is stated. For the subdivision depreciation costs, all the costs of the assets are put in this category. Finally there is the sub division

other operating costs, which is a residual division, because the costs that can not be in the first two sub division, are allocated to the last sub division.

5.2.3 Personnel costs

The functions set in the primary costs part are the production functions, the distribution functions, the different nursing and treatment functions. These functions are primary because they are directly needed to operate; to help the patients coming to the hospital. I have chosen to allocate the general functions, the administrative functions, the hotel functions, the personnel and organisation functions, the management and staff functions, the area and building functions and the technical and ICT functions as overhead.

The general and administrative functions and the personnel and organisation functions can not be allocated to products or patients, because they help the entire organisation with operating and not only the production part. It is a task of the P&O department to recruit new people; they do not only fill functions for nurses, but also general functions. They work for the whole organisation. The same counts for the management and staff functions; the people working there have a scope on helping the entire company and not indirect the patient. There are also managers for the different staff functions and the general and administrative department. The hotel functions I included by the overhead costs, because this is related to different facility tasks, like purchasing goods for the hospital store and purchasing goods for the decoration of the hospital and taking care of the decoration of the hospital. Also the security costs are part of this group, and this is not directly linked to the patients, but is also needed for every person working in the hospital. Also the area and building functions are part of the overhead, because the personnel working in these functions take care of the parking places and they fix and clean the building. Hereby they do not only clean and fix the parts of the organisation which are directly related to the patient care, but also for example the offices of the managers and the staff. The same argumentations could be applied for the technical support and the ICT functions.

5.2.4 Depreciation costs

The primary costs of this subdivision are the costs that are needed for the material and fixed assets and the costs for the inventory and the leased inventory. For the material and the fixed assets the patient rooms, the sanitary, the surgery rooms are an example. The building is necessary to start operating and to have patients. For the inventory the beds, the medical instruments etcetera are needed to help the patient as well.

The cost for immaterial assets, like the goodwill paid for when merging with other organisations are seen as overhead costs, because they are not directly linked to the primary processes of the organisation. For the depreciation for impairment and for the depreciation for financial assets goes the

same reasoning, these activities are not needed to keep the organisation operating, and therefore labelled as overhead costs. For the depreciation for automation and for maintenance investments the depreciations are done in a way that the whole organisation can profit from the activities, like the ICT systems which are used through the whole company especially at the administration department to make invoices. Depreciation for withdraw are more applicable as an administrative and accounting rule, which has nothing to do with the primary process itself, but more the way how money is stated on the profit and loss account. Therefore it is stated as overhead costs. Allocation to equalize is necessary to have a stable organisation and the financial structure of the organisation is trustworthy. These payments are not directly related to the primary processes of the organisation, but are needed to keep the organisation also healthy on the long run. Therefore these payments are seen as overhead costs, which can not be allocated to products and activities.

5.2.5 Other operating costs

Also in this sub division I made a separation between the primary costs (nutrition costs, patient related costs) and the overhead costs (hotel costs, general costs, area and building costs, maintenance and energy costs, alliance costs and allocation provision).

Nutrition costs and patient related costs are allocated to primary costs, because the nutrition patient related costs are directly linked to the patients / the operating part of the organisation. Nutrition costs are the costs of the food that the patients receive and for the patient related costs, medicine costs are an example.

The general costs of a hospital are costs for the administration, for different communication networks and for insurances for the hospital. None of these costs are directly related to the operational part of the organisation, but definitely needed to run the business, so that is way these costs are overhead costs. Hotel costs are allocated to the overhead costs, because of the reason that these costs are for decoration, for the delivery of goods for the several stores in the hospital, but also for the desk of the reception and so on. These costs are not directly linked to the patient care, because they are also there for personnel and for different kind of visitors. For the same reason area and building costs are overhead costs, because these are costs for having a clean parking lane and for painting the hospital etcetera. Maintenance and energy costs can also not be allocated to the patient care, because the energy bill is for lightning the whole hospital, also the offices of the administration and for the parking space. The same reasoning goes for the maintenance bill; things are repaired in the whole building and not only the parts where the patient is coming.

Rent and lease costs are also part of the overhead costs, because these costs are for the whole hospital building and not for different parts of the hospital. These rent costs are most of the time for extra

buildings and for temporarily locations, where divisions not directly related to the patient care are working. Some hospitals work together with other hospitals or other organisations. The hospital is receiving knowledge by having these alliances, but the alliances also cost money. And these costs are also stated in the other operating costs. These costs are defined as overhead costs, because the whole hospital is getting advantages of the alliances, but it is not directly defined to some product group, because it can differ from time to time. Allocation provision costs are costs which are temporary put aside for costs which can reasonably occur in the future. To be sure to have some extra money already for that payment, the company already put some money aside. This money can flow back in the organisation and therefore it is not necessary to operate. For that reason I stated the allocation provision as overhead costs.

Chapter 6: Methodology

In this chapter the focus is on how the research is executed and what the motivations where for doing the research this way. Further there will be some extra information on the operational part of the research and the process of choosing the sample. This research will have two parts and four steps.

In this research I will use an archival study and interviews to collect data to answer the research question. The advantages of doing an archival study are that the data is available and reasonably standardised. And for my data analysis, the annual reports of 2004 and 2005 are all known and placed on the internet, so it is easily available. In this research I am looking at the overhead costs and the costs on primary processes, with special focus on the loss part of the profit and loss account. Hereby the division that most annual reports make is labour costs, material costs and other costs. At last there is a sum up of all the costs made in the particular year. By making this analysis some problems can occur; although most hospitals are using the same format there are differences which needed to be interpreted when making one framework. In this chapter also the reasoning beyond the choices for the framework are explained.

A disadvantage could be that the data is viewed differently within the hospital organisations. Here for the second step is taken interviewing a part of the hospitals to see if the results of the analysis of the annual reports are the same as the answers in the interviews. The main advantage of doing interviews is that it is flexible, you could ask further on interesting and relevant topics. The disadvantage is that it is really time consuming and with not the right question it could end up not being useful as well. The focus is on asking the right questions, to receive the answers useful for the research (Baarda, 1995). Just as Modell (2005) states in his article that the combination of using case study and survey methods in a management accounting research will improve the validation of empirical findings. Where quantitative research can facilitate the process of analytical generalisation linked to theory, (Abernethy et al., 1999) qualitative research can enrich and refine findings in the quantitative research, but are also able to give alternative answers to the main research question as well and give answers on propositions which are not valid, what is a more explanatory function of qualitative research (Humphrey and Scapens, 1996; Ryan et al., 2002). By adding qualitative research to quantitative research, the external validation could grow.

6.1 Quantitative research

The first part of the empirical research is based on archival data. This means that the data is collected prior to the time the research was conducted. Necessary for this is to take some steps for this: first an event date has to be required, then the event window, a selection of the firms and the calculations have to be made. The chosen event date is 2004 and 2005. This because of the reason that in 2005 the DBC

system is introduced and at the moment of research the annual reports of 2006 are not available yet. The event window is the implementations of the DBC system, as also stated in the research question.

The first step is to define overhead and to make an instrument to measure the ratio overhead and primary processes. This framework would be based partly on the framework made by the firm Berenschot. I will improve this framework further, because the framework of Berenschot is not specialised in calculating the ratio for hospitals (Huijben, 2006). Other known frameworks are more based on portions of cost figures, like only personnel costs. With this new framework I would like to analyse all the costs of the hospital and I intend to make a framework specialised for hospitals.

The second step is to use this framework on about 95 annual reports of the Dutch hospitals from 2004 and 2005. Unfortunately not all the hospitals annual reports are available or having enough data to calculate. For that reason some hospitals are not part of the selection. In total there is an amount of 95 hospitals in the Netherlands, were 8 are University hospital, 19 are Top clinical and the rest 68 are General hospitals, as shown in table 5.1 (Ernst & Young, 2006). One annual report in the group General hospitals is missing. This hospital, Slotervaart Ziekenhuis in Amsterdam does not provide a public report. By using the framework there will be a division between overhead and primary processes. The results of the different years will be analysed of there are changes visible. The annual reports are published on www.jaarverslagenzorg.nl (Ministerie Volksgezondheid, Welzijn en Sport, 2006). The reason for using a ratio, because of the fact that production growth is not explicitly present.

Table 6.1: Population and selection table for empirical quantitative research

Population	Kind of hospital	Selection	Selection Percentage of population
8	University Medical Centres	8	100%
19	Top clinical hospitals	19	100%
68	General hospitals	67	98,5%
95	Total	94	99%

6.2 Qualitative research

The second part of the empirical research is an interview study. First a design of the interview is made and then the population is picked. Selection of the population is done by using the population used in the first part, the archival method. By doing these interviews as well, it is a check of the data from the archival method is interpreted well.

A third step is to select a small group of hospitals which would be used for qualitative research. These hospitals are selected on the type of the hospital, but also on basis of information available and the accessibility of this information. These hospitals are part of the framework and they are client of a consulting organisation, which gives me access to the hospitals, so the accessibility is higher. Further the hospitals chosen are most far from average in the results calculated by using the framework,

because these hospitals let us see why there ratio is higher or lower then average and again I have taken into account that all the different kind of hospitals are in the sample. I have interviewed 6 hospitals and 2 of every kind of hospital, to make comparisons between the hospitals within one group. These chosen hospitals are also spread over the ranking list for corporate governance in the health care sector (Ernst & Young, 2005).

The fourth step was doing the qualitative research. I held several interviews at the different hospitals. The interview explained what the reason is for the change in the ratio overhead and primary processes. A possible answer could be the DBC system. I interviewed persons, who could tell me most about the explanation of the ratio; these were the financial managers or the heads administration.

Table 6.2: Selection table for empirical qualitative research

Selection quantitative research	Kind of hospital	Selection qualitative research
8	University Medical Centres	2
19	Top clinical hospitals	2
67	General hospitals	2
94	Total	6

Chapter 7: Results of the calculated ratio

In this chapter the fourth sub question will be answered: 'How is the ratio between overhead and primary processes changed from 2004 or 2005?' In this chapter the results of calculating the ratio overhead and primary processes with the framework I introduced.

7.1 Ratios calculated by using this new framework

To calculate the ratio overhead and primary processes by using the framework, I divided the overhead costs by the costs for the primary processes and I also calculated the ratio using the overhead costs divided by the total costs. I calculated this ratio for every subdivision: personnel costs, depreciation costs and other operating costs and the ratio for the total amount of costs, following the framework in Table A.1. The calculation contains the two different ratios for 2004 and for 2005 of the hospitals (the names and abbreviations are in Table A.2) and the difference in percentage for the two years. But another separation is also made; I also calculated the different ratios for the different kinds of hospitals: the University medical centre (Table A.3), the Top clinical hospitals (Table A.4) and the General hospitals (A.5). At last there is a table (Table A.6) with the average results of all the hospitals.

7.1.1 Results of the University medical centres

The results of the ratios overhead and primary processes show that there was a slight growth in the personnel costs comparing overhead and primary processes. The ratio overhead and primary processes stayed the same: 39,6 % and comparing overhead to the total costs the overhead also stayed the same of 31,2%. There was a decrease in depreciation costs, because of the higher extra expenditure on depreciation for material fixed assets and inventory. The ratio overhead costs / primary costs decreased from 34,3% to 33,5% and for the ratio overhead costs compared with the total costs was de decrease minimum from 23,6% till 23,0%. However the operating costs increased on average for the University medical centres from 54,3 % till 57,3% for the ratio overhead compared with primary costs and compared with the total costs from 35,0 % till 36,2%. This because of the fact that compared with the primary costs, the general, hotel, area and building, maintenance and energy, rent and lease, and alliance costs increased. In total there was a small increase in the ratio overhead costs / primary costs calculated of 1,1%, but comparing the overhead costs to the total costs there was an increase of 0,5 %.

Table 7.1: Results averages for University Medical Centres

Hospital Year / change	Average University medical centres 2004	 2005	 Δ
Personnel costs			
Ratio overhead costs / primary costs	39,6%	39,6%	0,0%
Ratio overhead costs / total costs	31,2%	31,2%	0,0%
Depreciation costs			
Ratio overhead costs / primary costs	34,3%	33,5%	-0,8%
Ratio overhead costs / total costs	23,6%	23,0%	-0,6%
Other operating costs			

Ratio overhead costs / primary costs	54,3%	57,3%	3,1%
Ratio overhead costs / total costs	35,0%	36,2%	1,1%
Total			
Ratio overhead costs / primary costs	42,1%	43,1%	1,1%
Ratio overhead costs / total costs	30,9%	31,4%	0,52%

7.1.2 Results of the Top clinical hospitals

The overhead personnel costs compared with the primary personnel costs and the total personnel have decreased from 36,0% to 35,8 % and from 26,0% to 25,9%. But for the depreciation costs there was a decrease in ratio overhead costs and primary costs and total costs as well as by the University medical centres. For the ratio overhead costs / primary costs there was no change, it stayed 13,5% and for the ratio overhead costs / total costs there was a decrease of 0,2% from 11,4% till 11,2%. Looking at the other operating costs there was a decrease of 53,3% to 49,5% comparing the overhead costs with the primary costs and for the total costs a decrease from 33,9% to 32,3%. In total there was a decrease of 1,3% for the ratio overhead costs / primary processes and compared with the total costs a decrease of 0,6%.

Table 7.2: Results averages for Top clinical hospitals

Hospital	Average Top clinical hospitals		
Year / change	2004	2005	Δ
Personnel costs			
Ratio overhead costs / primary costs	36,0%	35,8%	-0,2%
Ratio overhead costs / total costs	26,0%	25,9%	-0,1%
Depreciation costs			
Ratio overhead costs / primary costs	13,5%	13,5%	0,0%
Ratio overhead costs / total costs	11,4%	11,2%	-0,2%
Other operating costs			
Ratio overhead costs / primary costs	53,3%	49,5%	-3,8%
Ratio overhead costs / total costs	33,9%	32,3%	-1,6%
Total			
Ratio overhead costs / primary costs	38,2%	36,9%	-1,3%
Ratio overhead costs / total costs	26,4%	25,8%	-0,6%

7.1.3 Results of the General hospitals

For the General hospitals there was a decrease for all the three subdivisions, what lead to a total decrease of 1,0 % for the ratio overhead costs / primary costs and 0,5% decrease for the ratio overhead costs / total costs. This is because the ratio overhead personnel costs compared with the primary personnel costs decreased from 35,5% till 35,2% and for the comparison with the total costs there was a decrease from 25,6% till 25,4 %. But the General hospitals also managed to decrease the depreciation costs ratio from 15,8% to 14,7 % for the primary costs comparison and an increase from 12,4% to 13,3 % for the total cost calculation. And just as the two other kinds of hospitals the General hospitals also claim a decrease on the operating costs from 53,7% to 50,9% for the ratio overhead costs / primary costs and a decrease from 26,2 % to 25,7 % for the ratio overhead costs / total costs.

Table 7.3: Results averages for general hospitals

Hospital Year / change	Average General hospitals 2004	 2005	 Δ
Personnel costs			
Ratio overhead costs / primary costs	35,5%	35,2%	-0,3%
Ratio overhead costs / total costs	25,6%	25,4%	-0,3%
Depreciation costs			
Ratio overhead costs / primary costs	15,8%	14,7%	-1,2%
Ratio overhead costs / total costs	12,4%	13,3%	0,9%
Other operating costs			
Ratio overhead costs / primary costs	53,7%	50,9%	-2,9%
Ratio overhead costs / total costs	34,2%	33,1%	-1,1%
Total			
Ratio overhead costs / primary costs	38,1%	37,1%	-1,0%
Ratio overhead costs / total costs	26,2%	25,7%	-0,5%

7.1.4 Results in total

In total there was a decrease for all the three subdivisions, what lead to a total decrease of 1,0 % for the ratio overhead costs / primary costs and 0,5% decrease for the ratio overhead costs / total costs. This is logical, because most of the averages of the subdivisions are negative as well. This is because the ratio overhead personnel costs compared with the primary personnel costs decreased from 35,9% till 35,6% and for the comparison with the total costs there was a decrease from 25,9% till 25,7 %. But the hospitals also managed to decrease the depreciation costs from 16,8% to 16,0 %, but had an increase in the ratio overhead / total costs from 12,9% till 13,5 %. All the hospitals claim a decrease on the operating costs, in total from 54,0% to 51,1% for the ratio overhead costs / primary costs and a decrease from 34,0 % to 32,9 % for the ratio overhead costs / total costs.

Table 7.4: Results averages total selection hospital

Hospital Year / change	Average Total 	 	
Personnel costs			
Ratio overhead costs / primary costs	35,9%	35,6%	-0,3%
Ratio overhead costs / total costs	25,9%	25,7%	-0,2%
Depreciation costs			
Ratio overhead costs / primary costs	16,8%	16,0%	-0,8%
Ratio overhead costs / total costs	12,9%	13,5%	0,6%
Other operating costs			
Ratio overhead costs / primary costs	54,0%	51,1%	-2,9%
Ratio overhead costs / total costs	34,0%	32,9%	-1,1%
Total			
Ratio overhead costs / primary costs	38,5%	37,5%	-1,0%
Ratio overhead costs / total costs	26,4%	26,0%	-0,5%

7.2 Discussion of the results

Looking at the results the following question can be answered: 'How is the ratio between overhead and primary processes changed from 2004 or 2005?' The ratio has decreased in both the ratios overhead compared to primary processes with 1,0% and compared with the total costs with 0,5%.

Comparing this result with the hypothesis stated earlier in the thesis, the answer is negative. In the proposition the expected answer was that there was supposed to be a change of the ratio overhead and primary processes in the annual reports of the hospitals in 2004 and 2005. And this ratio would be changed positively as stated in the hypothesis. So the results of the framework were not what I expected to be, because of the negative results, which were also small changes.

Looking at the numbers from the annual reports this change in ratio is not because of the fact that the overhead costs decreased, but more because of the fact that the primary processes costs were higher compared to the increase of the overhead costs. Some hospitals mention this especially in their annual reports.

In 't Lange Land Ziekenhuis is the increase in work hours for 80% realised in the primary processes part and only 20% for functions in the overhead. Here for the overhead is increased, but the costs of primary processes are increased even more. This explains the decrease in percentage of the ratio overhead to primary processes ('t Lange Land Ziekenhuis, 2006). In this example we can see that the primary personnel costs have been increased more then the costs for overhead personnel. This is also seen in the ratios presented in table A.5.

Another explanation for the lower other operating costs is that the medicine provided for the patients are increased in price. Here for the prices of operating costs had a higher growth then the overhead costs (Spaarne Ziekenhuis, 2006). Also in the United States account the pharmaceutical costs now for the largest portion of health cost increases (Ginsburg, 1998).

Also het Gelre Ziekenhuis gives an explanation for the reduction of overhead ratio. It states that they outsourced some of its tasks, which were part of the overhead costs. Other companies can do this task cheaper and there for the costs decreased in 2005 (Gelre ziekenhuis, 2006). This decrease in costs is seen in the table A.5 as well, the ratio overhead costs compared to the primary costs and the total costs dropped.

7.3 Proposition

Looking at the proposition stated before on answering the question: To what degree has the introduction of the DBC system affected the ratio overhead and primary processes of the hospitals in

2004 and 2005 and how can this be explained?', stated was that the ratio would be positive because of the fact of extra complexity, extra costs for calculation of the cost price and also the implementation problems could lead to higher costs. Then looking at the results of the quantitative research the proposition is false, because the data show us a negative result of the ratio overhead and primary processes. This proposition will be further analysed in the qualitative research part.

The results answer the question with a total decrease of 1,0 % for the ratio overhead costs / primary costs and 0,5% decrease for the ratio overhead costs / total costs. This is the contrary what the proposition was saying. When having a look at the data entered, the explanation for this decrease could be the high increase in costs for the primary processes. Many hospitals had high medicine costs and use and they also hired extra nursing personnel. The overhead costs grew as well, but not that much as the primary costs, what will result in a decreasing ratio. However the interviews will explain the results further in the following chapter.

Chapter 8: Implementation of the DBC system

In this chapter the focus is on the fifth sub question: 'What is the role of the implementation of the DBC system on the ratio overhead and primary processes in the reality?' At the beginning of the chapter there will be a look at these results compared to practice by having interview with managers in different hospitals. Different aspects will be focussed on, like the feedback from the hospitals on the DBC system, but also the explanation for the change in overhead, and the reaction of the hospitals on the ratios from the framework. In the end the proposition is discussed.

In this first part attention will be given to the qualitative research. First some reactions from annual reports from hospitals in the selection of the quantitative research are stated. Then the interviews are reported and analysed. This selection consists of 6 hospitals, 2 from every kind. The hospitals are selected on the base that they are most for from average. The hospitals chosen are displayed in Table A.8.

8.1 Report evidence

Most of the hospitals give their feedback on the DBC system in their annual report. Most of the hospitals state in their annual report that they want a more simple DBC system, this would reduce the complexity and therefore also maybe the overhead costs. The following hospitals give also clear examples of their feedback on the DBC system and they give you an idea of what kind of actions they took for implementing the DBC system.

The Reinier de Graaf Groep states clearly in their annual report that in 2005 they paid extra attention on implementing and optimising the DBC system, especially the registration and validation process. So they installed new computer software that integrates registration of the actions with validation and invoicing. There was also special attention for medical specialists and there assistants, to have extra control on the administrative organisation and the internal control (Reinier de Graaf Groep, 2006).

But also the Sint Elisabeth Ziekenhuis (2006) in Tilburg reports that the implementation of the DBC system has a great burden for there administrative load for the hospital organisation and the medical specialists. The specialists had to register 180 000 DBCs in 2005, that takes 2 till 3 minutes every time, so an extra workload of 6000 hours. But on the other hand the hospital admitted that they wanted to have more insight in the costs of the hospital and the comparable reimbursement. However the system is now still to complex and it is needed that the medical specialists should be more supported by administrative staff (Sint Elisabeth Ziekenhuis, 2006).

Another example is the Deventer Ziekenhuis, this company states in their annual report that due of the implementation of the DBC system they employed 4 extra full time workers especially to have a

smooth introduction of the automatic coding. They were extra careful with invoicing the products, so that the exercised actions were also paid (Deventer Ziekenhuis, 2006).

And also het Diaconessen ziekenhuis in Leiden states in their annual report that because of the introduction of the DBC system, the hospital had rising administrative problems, not only higher costs on the administrative part, but also introducing a new system to compose their annual report. But in the same report the hospital indicates that the increased number of employees is also seen in the production process (Diaconessenhuis, 2006).

8.2 Feedback from the interviewed hospitals

In this part of the thesis the interview with the hospitals will be displayed. First there will be a description of the interview for each one of the hospitals, followed by an overview to compare the different hospitals with each other, concluding with a table in the appendix (A.9) to give the reader the possibility to see the results in a short amount of time.

The reports of the interviews are per interview divided into three sections: change in overhead; change in the ratio overhead and primary processes and implementation of the DBC system. The first paragraph on the change in overhead shows whether the organisation has attention for the overhead at all, and if there are changes in it. The second paragraph focuses more on the ratio, which is an important part of the thesis. At last the implementation of the DBC system is reported, with help of the different key points stated before to analyse the rational choice theory, social learning theory and the institutional theory. In the analysis these different theories are used separately.

8.2.1 Hospital A1

This University medical centre has 882 beds and uses 5377 FTEs every year and the revenue of 2005 was 511785 euro (A1 annual report, 2006). Doing research and teaching tasks are important to the hospital, next to the health treatments. The organisation is not only providing general and Top clinical treatments, but also the most complex treatments are given, called the top referent treatments.

Change in overhead

The overhead costs did not decrease because of the implementation of the DBC system. The latest years the hospital was able to decrease the costs, mainly because of differential ICT applications by improving the registration and invoice process. Because of this digitalisation there was more efficiency at the medical administration department, so they were able to help with the implementation of the DBC system. The hospital management is trying to reduce the costs by working with budgets, which are not linked to revenues. At the beginning of every year the budgets are set for all the different divisions and the division is supposed to stick with this budget. When a division has reached

their aimed production target, they will receive extra money, what is a reimbursement percentage of the extra products price. The management of the hospital are occupied with decreasing costs, which can also be drawn from the following remark: '*Within the hospital they started a deregulating project as well, with the meaning that the different divisions have a sharp and critical look at the rules and processes and to cut down on the unnecessary ones'* (A1a, 2007).

Change in the ratio overhead and primary processes

A part of the costs for implementing the DBC system is part of the jobs of specialists, and so the primary processes, because they are the ones entering the data for the DBC system. Normally they had to enter the data in the internal hospital system, but know they have to do this twice, to have also the data in the DBC system. When both systems would be integrated, this would help in cutting down extra processes and costs. From 2008 on the treatments will not be entered anymore, but these will be linked to the diagnosis input. At the moment the Vrije Universiteit Amsterdam is experimenting with this. When all the DBCs are part of the B segment, there will be a clearer link between revenue and the DBC invoices, what could lead to more transparency (A1 annual report, 2006).

Implementation of the DBC system

The implementation of the DBC system was not in line with other goals of the organisation, because the goal of the organisation is to deliver as much qualitative products as possible within the stated budget. The introduction of the DBC system is mostly seen as necessary to receive a reimbursement. The hospital would rather work with a lump sum budget for the different tasks they have, especially because of the fact that other divisions of the organisation are still working with lump sum budgets as the teaching and research department. Another reason for preferring lump sum budget is the following remark: *'another special task of the hospital is to help patients with problems which can not be helped in other general and Top clinical hospitals, this top referent care is also financed with lump sum budgets'* (A1a, 2007).

The organisation only has to work with the DBC system for the treatments which are also done at the general and Top clinical hospitals. These treatments are done at the Academic hospitals as part of the teaching function, but will only exists within a limited amount. Because these treatments are necessary for the hospital teaching tasks is the calculation of the cost price not that interesting, because these treatments are necessary for the quality of the education. *'Another point is that it is really difficult to calculate the cost price, because of the fact that the different functions are not ordered by task, they all interrelate with each other'* (A1a, 2007). And the management solved this as follows: *'To pass on the information on the cost calculation to the DIS the hospital did a benchmark between the cost prices of the Rijnland ziekenhuis, the Diaconessenhuis and the VU medical centre and by analysing these costs they made a strategic selling price'* (A1b, 2007). But internal there is a marginal cost calculation per

division and per process, and for each of these divisions and processes the budget is also important. It is really too expensive to calculate the cost price for all the different products, especially when only two percent of the products are now part of the B segment, to negotiate on.

The hospital had enough knowledge and also enough material components to start with the implementation of the DBC system. There were also enough employees available at the medical administration, because of the different ICT systems that reduced the administrative workload the years before. Most of the information the hospital received from the government, the NZA (Nederlandse Zorgautoriteit), and the HEAD organisation (association for the financial, management and information management in the health care sector).

When employees have questions or problems, they have to go to the medical administration. And the medical administration can attend with their questions and problems to the contact persons at DBC onderhoud, so these questions can be answered and problems can be solved. If a lot of the hospitals have the same problems, DBC onderhoud has the power to change parts of the system, but of course this will take a while. The medical administration has monthly meetings with other Academic hospitals, most of the time organised by the HEAD to talk about different Academic medical centres topics, but the DBC system has also a lot of attention. Other meeting are organised by the NFU (the Dutch association of Academic medical centres) in cooperation with the NVZ, to discuss problems with the DBC system.

Within the whole hospital organisation the advantages of the DBC system are not felt. The government is seen as the pressure to implement this system. Most of all, the specialists and the medical administration have extra work because of this system. Especially the specialists need to be pushed to keep track of the administration of the DBCs. The management did this as follows: *'To motivate the specialists to enter the data into the DBC system they are explained that it is necessary to receive budget by making invoices'* (A1a, 2007).

The DBC system is really complex and it is needed for the future to make an adjustment; not only by not entering the treatment anymore, but to link this to diagnoses, but also to reduce the number of DBCs (A1 annual report, 2006). But the management also saw advantages: *'The invoice system is however more transparent and easier than the old former functional budgeting system, and without ICT registration'* (A1a, 2007). Before 2005 the hospitals only had to register and invoice the treatments, since the implementation of the DBC system, the hospitals have to register the treatments and also the DBC, consisting of a diagnosis and the treatment, but from 2008 on the hospitals need to register treatments and the DBC consisting the diagnosis. For the patient the DBC system is not that helpful, I can draws this from the following remark: *'Another point for the future is that the products*

are to complex for patients to grasp when the system is totally ready to be negotiated on, especially when the patient does not have to pay directly' (A1b, 2007).

8.2.2 Hospital A2

This Academic medical centre located in Amsterdam has 1002 beds and uses 6133 FTEs a year and the revenue of 2005 was 565239 euro. Also this hospital is doing research and teaching tasks next to the health treatments. The hospital is providing General and Top clinical treatments and top referent treatments (A2 annual report, 2006).

Change in overhead

At the moment there is attention for decreasing the costs in general to have a healthier financial situation. For this reason there is also attention for a decrease in overhead. *'There is a critical view on the different processes, to see what is necessary and what could be cut down to decrease the costs'* (A2a, 2007). The extra costs for the implementation of the DBC system can not be directly allocated to the overhead costs. There are some extra employees on the administration department to help do extra work because of the implementation of the DBC system, but if this is directly overhead costs is the question. This is depending on the way costs are allocated to the products; however there is an increase in the administrative burden. The DBC system did had extra costs, as stated as follows: *'It is also clear that the implementation brought extra costs, for example the costs for the self made application for the ICT system the organisation made'* (A2a, 2007).

Change in the ratio overhead and primary processes

The organisation had also special attention for decreasing costs for the primary processes. The organisation did not really focus on the report 'Sneller Beter' (a report focussed on efficiency for hospital operations), but they did have a closer look at the logistics to see if costs and time could be saved. They also reviewed different processes to see whether they were necessary. The reason for these reviews is the fact that the financing structure should be improved to have a better liquidity rate. Also the annual report state that in the year plans of 2006 the focus will be on measures to improve the internal management to cut extra costs. For the DBC system the focus will be on timely and complete invoicing (A2 annual report, 2006). The negative operating result in 2005 pushes the hospital to have more focus on the activities they provide. The hospital is looking for new opportunities to use the existing tools to have more result, by working smarter and more efficient (A2 annual report, 2006). The organisation has the goal to spend differently, to have lower overhead costs and also to lower the primary costs.

Implementation of the DBC system

They had problems with the software, because the organisation decided to start with a specialised own application, with the reason to have a desktop possibility that was known to the specialists. *'Another reason to make an application that was related to the former application, to have no changes in the front office to relieve some of the obligations to the specialists. However the problems of this application was to update, this could not be done easily, for that reason the hospital decided to change from the own application to an external supplier'* (A2a, 2007).

At the beginning the goals of the DBC system were clear to the financial departments. The specialists stayed more focussed on the delivery of health care, and less on the financial matters. However the reaction of the specialists was not negative as expected: *'But there reaction to the implementation of the DBC system was not disappointing, they where definitely enthusiastic'* (A2a, 2007). It can not be said that the knowledge and support was not good enough to implement the DBC system, especially because the system is running now. But the knowledge is limited to a certain amount of people in the organisation; this could be a threat to the organisation.

The implementation of the DBC system was not directly in line with other goals set by the organisation, it is obvious that it is implemented because of the political pressure. At the moment the management is looking at the cost prices, but mostly transfer prices. The management thinks it is difficult to set the costs prices, because of the educational task of the organisation, this is different from General and Top clinical organisations. In the future these prices should help to see which products should have more attention. The organisation passed on the sales prices to the DIS, because there was a lot of resistance to send the cost prices to the DIS.

Different training days and information meetings were organised complementary with educational trainings to prepare the employees. They also formed a task force to guide the implementation of the DBC system. A third action was setting up meetings of different work groups to solve problems of the system. At the moment decentralized departments help the central department to have an organised administration.

To motivate the specialists to enter the DBC data correctly they keep track on the information entered. The organisation also held information meetings, whereby ratings are stated to see which divisions and specialists did not enter all the DBC data, this was confronting but also motivating. At the moment the hospitals arranges interviews with specialists which are behind with entering data. There is also more management information given to the employees to increase the knowledge level. The employees can ask their questions to the health care administration or call to the helpdesk. For questions the back up is really good. If the health care administration has questions they can go to DBC onderhoud or to the

NZA. The following remark shows that the organisation did specialised the system: *'At the beginning of the implementation the hospital made their own code list in cooperation with the specialists to make sure that the data was available to enter the diagnoses and treatments'* (A2a, 2007).

The hospital organisation is mostly focused on the own organisation, but is also doing a lot of different benchmarks. There is an open communication between different organisations, mainly Academic hospitals. The benchmarks are not only done on central level, but also decentralized by having work groups with other organisations. The NFU organisation is also involved in these corporations. Within the organisation there is not really a focus on cost efficiency; the administrative and financial departments are more seen as supportive departments of the production. Another point is the divisional structure of the organisation, every division has its own budget; this is not really an advantage for cost efficiency. The attention for cost efficiency is because of the pressure to have a healthy financing structure. At the moment there is more focus on keeping track on the budget results, more then in the past. When budgets are not sufficient the division should have a good explanation. Now the specialists are mostly thinking in quality and numbers, like how many people they have helped and not really in money, this could be a problem when the payment of the specialists is depending on the DBC results.

The DBC system is more complex then the former functional budgeting system, for the reason that two systems exists at the same time. Another difficulty is to have a good registration by the administrational department, this is timely and costly. For the patients the implementation of the DBC system did not give more clarity, especially because of the totalled invoiced instead of sending invoicing per treatment. At the moment the waiting lists are decreased, mainly because the hospital organisations do not make any product agreements any more in the B segment, not directly because of the DBC system.

8.2.3 Hospital T1

This Top clinical hospital has 785 beds and uses 2332 FTEs every year and the revenue of 2005 was 187514 euro. But there was also raise of 1,5% in the numbers of treatments (T1 annual report, 2006).

Change in overhead

The hospital sees the following parts of the organisation as overhead: the facility department, the P&O department, the administration and economic department, the department responsible for education, the board of directors and the top management. The aim of the organisation was to prevent the overhead costs from rising, but it would be better if the costs decreased. However there is still a budget for ICT investment, which will help to decrease the costs on long term. For the implementation of the DBC system, the hospital hired an external specialised bureau. This bureau still helps the organisation to improve the implementation of the DBC system and to guard the quality of the registration. The

costs for this bureau are allocated to the other operating costs. But the organisation had also other costs because of the DBC system: *'The hospital had also addition interest costs to create a stable liquid position, because of the change in finance'* (T1a, 2007). During the year 2005 the hospital also implemented a new hospital information system: EZIS. This information system has advantages for planning, but also to keep track of patient information. In addition new electronic passes are introduced for patients, with photo and barcode. The costs for this system where budgeted via the ICT provision (T1 annual report, 2006).

Change in the ratio overhead and primary processes

The hospital had not only the aim to decrease the overhead costs, also the primary costs had to be less. To accomplish this, the organisation worked with the 'Sneller Beter' process, to implement accounting rates to improve efficiency. The results of this project will be seen from 2006 on. Most of the high primary costs are expenditure where the hospital will receive a reimbursement as well, like high medicine costs. So although the primary costs increased the hospital is taking action to improve the efficiency where necessary and other costs will be compensated.

Implementation of the DBC system

The organisation had no additional problems by the implementation of the DBC system. The organisation had the following extra costs: *'The costs for the introduction of the DBC system were the costs spend on the external bureau. These costs where allocated to 2004 and 2005, but the bureau is still active to improve the efficiency and quality of reporting. However the organisation sees these costs mostly as an investment, because the system will give transparency in the long term and give the advantage of reducing costs'* (T1a, 2007).

The goals of the implementation of the DBC system are getting clearer for the whole organisation, which can be drawn from the following statement: *'At the moment most of the goals are clear for the financial department, but the organisation is ready for the next step to make the goals clear to the whole organisation, starting with the specialists by making them more aware of the costs of the products. The specialists receive more information on profiles of products and they are also involved by creating budgets'* (T1a, 2007).

From the beginning the information from the government was sufficient and also the given knowledge and support was enough to implement the system. At the moment a lot of literature is available on the DBC system, but it is also possible to have meetings with other governmental organisations and other hospitals. At the beginning the system was complex, because of the different possibilities for every product, but after a year the system is good to work with and most of the employees see the

advantages like transparency. The organisation has calculated the DBC cost price for every product and this will give better insight where to change management goals.

Because the implementation of the system was needed from the government and with the help of the external bureau, it was easier to convince the employees that the implementation was needed. However not everybody was really happy with this change. The administration had to deal with most of the complaints and also the specialists received more work, because they had to enter the data twice; in the hospital information system and the DBC system.

Most of the information for the introduction of the DBC system is received from governmental organisations and in addition the NVZ (the Dutch association for hospitals) helped as well. The NVZ also arranged meetings with other hospitals to share information with each other. The aim of the hospital is to create a stable internal organisation with the DBC system and as a next step to compare their results to market information. But unfortunately this information is still lacking. As an alternative they contacted other hospitals to create a benchmark. *'But most of the hospitals are reserved for giving information, maybe thinking of the coming market competition'* (T1a, 2007).

The feedback of the employees will be processed by the administration. The administration is answering most questions and solving most problems and if they have questions or problems with the system they can go to the contact persons at NVZ or at the governmental organisations. But if the hospitals really want to change a certain DBC, they have to take the official track, what takes a lot of time. This could be improved.

The financial department is conscious that cost efficiency is necessary to keep the organisation healthy, but the main issue at the moment is to show the employees the advantages of the implementation of the DBC system. The organisation reacted as follows: *'The organisation is trying to solve this problem helped by the external specialised bureau 'Star'. Now is the organisation focussing on the specialists to give them a more positive view on the DBC system and show them the advantages and that the system does not only mean extra work'* (T1a, 2007). They will try to reach this goal to show that the system means more transparency, and to link responsibility and consequences to the agreements made. The financial department sees the DBC system mostly as a tool to reach the goal of thinking cost efficient, and their task is to change this in the whole organisation.

Although the hospitals need to focus on costs, they also have to think more service oriented. The specialists have at the moment the view that patients will come anyway. But for the future the hospitals need to have a good price, but good quality and a marketing plan as well to attract patients (T1 annual report, 2006).

For the future the hospital management thinks that is necessary to reduce the quantity of the different DBCs to implement a free market for all the DBCs. Another point is that the internal hospital system should be more integrated in the DBC system, to have a reduction in entering information. *'The DBC system should provide more (market) information, to increase the rate of cost efficient thinking'* (T1a, 2007).

8.2.4 Hospital T2

This Top clinical hospital has 959 beds and uses 3550 FTEs every year and the revenue of 2005 was 278703 euro (T2 annual report, 2006).

Change in overhead

The organisation is concerned with the overhead referring to the budgeting policy. The hospital works with budgets, containing overhead. The organisation has the intention to create a new internal budgeting system, with more focus on the overhead costs. The latest years there were cut downs at the P&O department and the quality department. For the registration of the DBCs there were extra overhead costs, especially because they hired an extra application employee. They also hired five extra people for the validation of the DBCs; these employees are middle to high educated. They also extracted two highly educated employees to calculate the cost prices. However they also cancelled jobs at the health care administration, these where mainly people who were low educated. There were also higher investment costs for the ICT department, because of the software and the licences. The specialists had also extra work, because they have to register the data, but this is not shown in the results of the hospitals, because they are paid via the lump sum budget.

Change in the ratio overhead and primary processes

The latest years there was extra attention for the primary costs as well. They had to cut 10 million in costs last year, of which 4 million has to be cut at the purchase department. The organisation did this as follows: *'The hospital is trying to realise this by organising 'break through' projects, these are projects with the focus on the optimum by planning and logistics'* (T2a, 2007). However the latest years the costs for the primary processes rose enormous, especially for the medicines and the costs for implantation parts. Another high cost area is the rise in costs for lab research. The hospital did more researches this year.

Implementation of the DBC system

The following remark shows the time line of implementation of the DBC system: *'This hospital started late with the implementation of the DBC system, because they wanted to be sure that it was really official happening. But when they started, they made a really fast progress'* (T2a, 2007).

The hospital created a project group with an internal leader, with support of somebody hired from an external organisation, to have extra knowledge, and also to have external view on the situation. The hospital also hired external people to have good look at the high falling – out of the validation of the DBCs. Later an internal group of people looked at this falling- out, what had a positive effect on the rate. The hospital used software of an external company.

The hospital implemented the DBC system, because they felt the pressure of the policy makers that they needed to implement to receive reimbursement. However they noticed that the goals of the system were in line with their own goals, like transparency, but this was not a reason to implement this with high support from within the organisation.

The organisation management did calculate distribution codes to divide the costs to the different products and they are thinking of calculating the cost price in the near future. They also want to use these prices in the new internal budget system, to calculate the budget by multiplying the activities with the price. The distribution codes where calculated in the central part of the organisation, but the calculation of the cost prices should be a co production between the decentralised departments and the central organisation. The organisation management has a idea how to implement this: *'It is important that the financial and management department communicate this new budget in a positive and understandable way to the production departments'* (T2a, 2007). The calculation of the cost prices helps the organisation to adjust the strategic goals and the product portfolio (T2 annual report, 2006).

The hospital was aware of the different goals of the DBC system, like transparency and support of the free market. The system is focused on effectively, patient care and efficiency of the health care products and the medical standard (T2 annual report, 2006). The hospital had enough knowledge and support to implement the system, definitely because they are big hospital, with a lot of high educated employees. To implement the system the hospital organised training days together with education possibilities. They also made a DBC website for the intranet.

The organisation also created a project group with different kind of members: an employee of the treatment administration, medical specialists, DBC specialists and employees of different departments. This group is the contact group if there are problems with the system. They also appointed contact persons for every specialism, so if there were problems these people were contacted first. These persons also had the commission to adjust entered data, when needed. At the beginning this project group received information and they discussed several themes, later they discussed recent problems and shared information. Another action from the management was as follows: *'The hospital also organised meetings for the secretaries of the medical specialists and the poli-secretaries. If the project*

group has questions they can go to DBC onderhoud. For questions this is a good solution, only for adjustments the track is taking more time' (T2a, 2007).

The implementation of the DBC system is in line with other goals of the organisation, like the goal of having a fit organisation or to work smart to have the best result. The transparency goal of the DBC system complements this. The hospital is really active in doing benchmarks, like the Prismant questionnaire. They are also part of meetings and workshops of the NVZ together with other hospitals. But also the decentralized departments have their own benchmarks and the hospital analyses feedback of the insurances companies, like the standard for logistic times.

The financial and management department are more cost focussed, definitely because they want to change the internal budget system. This change in thinking will slowly be implemented throughout the whole organisation. In 2008 probably the lump sum for the payment of the specialist will be discarded, and then more cost awareness can be created. *'At the moment there is pressure from the regional organisation, which provides the lump sum, because they threatened the specialists to cut down payment, when they did not register well enough'*(T2a, 2007). This was not really necessary to take into action, but they did have some serious conversations with the specialists on entering data. The hospital management did also arrange conversations with the specialists (in public) on the low results of entering data.

The DBC system is more complex compared to the functional budgeting system, but compared with the CTG system, it is equally difficult. There are big differences between the specialisms concerned complexity, because of the differences in coding. In the future it would be helpful if the total number of DBCs could decrease. The invoice system is not clearer for the patient. A positive element is that the hospital now realises that the organisation should be more customer orientated, especially for the B segment. The hospital had extra interest in communication, like improving the internet site with information on the waiting lists. The hospital also hired a marketer and the organisation worked with extra advertisements in the local papers. The next challenge is to improve the customer orientation also within the organisation.

8.2.5 Hospital G1

This General hospital has 140 beds and uses 422 FTEs every year and the revenue of 2005 was 33454 euro. This hospital is part of a foundation with a nursing home and four homes for the elderly (G1 annual report, 2006).

Change in overhead

At the moment the hospital does not have any special attention for overhead costs. However the hospital is constantly looking at the processes if they are needed or not. The different treatments combined in a DBC can help by analysing this. The implementation of the DBC system leads to more costs especially for ICT, although the organisation did receive a high amount of subsidy to support the costs for the hospital. What started as an initiative from the government to have a more transparent way of making invoices for the treatments given is at the same time a complicated administrative process.

Change in the ratio overhead and primary processes

The hospital is trying to focus on costs by making reports every month and every quarter to analyse the financial statements, most attention is for the personal costs. An important tool is the management information given by the company Prismant, to compare the statements to other hospitals. The hospital is also looking at different performance indicators to see if they operating good enough compared to the market, especially for the products in the B segment they analysed the performance with national statistics, most of the time the hospital performed well.

The quality manager is working with the report 'Sneller Beter', to focus on more efficiency in the health care organisation and he is planning to implement this more in the future. The merge with the other health care organisations in the neighbourhood, helped to have lower costs, by cutting expenses for administration and other overhead. In the nearby future also the financial department will be held on one location and the management had the following action: *'Another point to decrease costs is the corporation for purchasing; the organisation is part of a corporation within the Rijnmond region'* (G1a, 2007). The costs for primary processes have increased with € 524.000 in 2005 compared with the year before. Hereby the ratio has changed as well (G1 annual report, 2006).

Implementation of the DBC system

In 2002 the organisation started with the implementation of the DBC system. For example: *'The neurology department started even a year before. Most of the specialists enter the data digital, but some of them are still documenting on paper and their secretary will enter the data in to the system'* (G1a, 2007). This process starts with a proper and timely opening of the valid DBC by the medical specialist or secretary. Then all the different treatments need to be entered and the process ends with sending the invoice to the patient or insurance company. It is needed to improve the system even further to have a more transparent result (G1 annual report, 2006).

'The organisation calculated the cost prices of the different products. However when they tried to negotiated on prices with the health care insurance companies, this went wrong, the insurance

companies just set the prices on the basic level plus 5 percent. The hospital hopes to negotiate better the coming years using the cost prices' (G1a, 2007). By calculating cost prices it is easier to use them as transfer prices within the organisation as well (G1 annual report, 2006). The cost prices are also used to see which products are break even and which not. The hospital has the aim to be a basic hospital and provide basic products. For more specialised products the patients have to go to bigger hospitals.
Within the financial department the focus is more on costs, and they are thinking more cost efficient. In other departments the focus on costs is less. However when these departments cross there budgets, they have to have a good argument.

The hospital had decided to implement the DBC system without hiring an external company. They made a specialised front office, which combined the DBC system with the hospital information system. Hereby the information has to be entered only one time and by specialising the system, there could be extra attention to valid entered DBCs. The back office is made by a software company and to have a specialised system, there were sessions with seven other hospitals to improve the system. This combined system delivers information for the DBC registration, but also patient information (G1 annual report, 2006).

To implement the DBC system the hospital formed a workgroup to pass on information but also to solve problems. In this workgroup medical secretaries, ICT employee, planning and control employee and the specialists take part (G1 annual report, 2006). The hospital also held trainings days for employees and specialists to give them the correct information. The board of directors decided later on that an additional task needed to complement these meetings, so the planning and control department started a DBC helpdesk where the employees, mainly secretaries can ask DBC related questions. For every specialism a contact point is directed, with the reason that the planning and control employee can pass on information to that person. The hospital also hired extra persons: *'At the moment the two employees at the planning and control employees, which are filling the help desk function, are also analysing the DBC results. A third person is more involved with the policy made for the DBC system'* (G1a, 2007).

When the employees have questions about the front office, the ICT employee who designed the application can solve this problem. For question on the back office the software company is consulted. If there are questions on the DBC system itself the helpdesk can be called and the planning and control employee can contact DBC onderhoud. There is a strong relationship between the planning and control and DBC onderhoud, they share a lot of information.

The organisation is eager to do a benchmark to compare the results of the own organisation with other organisations, to see what the performance of the hospital is. However this information is not provided by the DIS. The hospitals need to ask this to the NVZ and they need to pass this on to VWS. At the moment the hospital is focus on the internal organisation, but they have sometimes communications with other hospital organisations, like the Ruwaard van Putten hospital in Spijkenisse.

For implementing the DBC system there was a lot of goodwill by the employees, for the reason that the hospital is small, and everybody is willing to help. Also the idea of using workgroups helped because people felt part of the system. The personal approach was also helpful to get people to implement the system.

The DBC system is seen as more complex, for that reason the hospital needs to hire higher educated employees and also extra people, for instance on the planning and control department. The system is not per definition seen as more service oriented, because of the complexity. *'But indirect it has advantages for patients, like the shorter time spans to be helped and the improved and faster logistics'* (G1a, 2007).

8.2.6 Hospital G2

This General hospital has 230 beds and uses 641 FTE's every year. The revenue of the year 2005 was 50617 euro. This is a small hospital in the general segment. Their primary task is to deal with the modal treatments for the citizens in the direct neighbourhood (G2 annual report, 2006).

Change in overhead costs

The introduction of the DBC system has caused a lot of extra costs. The hospital has hired one person, 0,5 FTE to have extra attention for the internal control and they hired two extra persons, 2 FTE to focus more on the validation for the DBC system. The hospital had also extra costs for the ICT system, like the licences and because the specialists should have computers all the time to enter the correct data. For a lot of these costs several allowances from the government were available, but these were most of the time late and the costs still needed to be paid. The organisation had the goal to decrease the overhead costs for several years now. At the moment of the implementation of the DBC system, the hospital did not have any other big projects, which were costly.

Change in the ratio overhead and primary costs

The primary costs increased much more, compared to the overhead costs. This was because the extra costs for expensive medicine and because of the higher costs for personal costs for the primary tasks. The organisation has a growth of 5% for every year, and a cost increase of 3%, whereby also the overhead increased, what is causing higher total costs as well. In the hospital an increase in work

hours for 80% is realised in the primary processes part and only 20% for functions in the overhead. Here for the overhead is increased, but the costs of primary processes are increased even more. This explains the decrease in percentage of the ratio overhead to primary processes (G2 annual report, 2006).

Implementation of the DBC system

The implementation of the DBC system caused a lot of software problems by most of the hospitals. The consequences of the software problems were liquidity problems because it was not possible to invoice most of the DBCs; however with support of the bank liquidity shortage was not a treat to the organisation. During the year 2005 the software problems were solved and the delays in making invoices were solved at the end of the year. But because of changes in rules by the CTG again the invoices were not prepared on time (G2 annual report, 2006).

However the administration department and the financial department were happy with the DBC system because of the fact that this implementation gave the opportunity to identify the different products and the cost price of these products. So it was easier to see which products had a high margin and which had a lower margin. The goals of the implementation of the DBC system were clearly communicated and for the implementation enough knowledge was within the organisation. However the funds where not sufficient enough to implement the DBC system good enough and also the time span was really short. The hospital needs a more stable environment now. This statement is drawn from the following remark: *'Another point is that the system was not really stable after the implementation. Since the introduction the system changed so many times that the hospitals did not have the time to adjust to the new situation'* (G2a, 2007).

When employees have questions or problems with the DBC system, they can go to the administration. Because the hospital is relative small, the network within the organisation is really small as well. So the specialists all know the right persons to answer their questions. When the administration has questions or problems they have to try to solve this within the organisation. Because of the small size of the hospital they do not have a lot of influence for changing the DBC system. The administration is expected to work with the funds and the knowledge they already have and most of the time these funds and knowledge were sufficient, because the organisation works with the more basic diagnoses and treatments.

The implementation of the DBC system is in line with other goals set by the organisation, like the attention for the costs of the different products. The information on the introduction of the DBC system came from the government, from DBC onderhoud en from the several meetings organised by different associations. At the moment not enough market information is known, so it is not possible to

do a benchmark and see whether the hospital is doing well compared to other hospitals. In the future the DIS (DBC Information System) will also give information to the organisation, and not only collect the information. DIS will have the task to set benchmarks, just like Prismant company did before, because of the following remark: *'With these benchmarks the organisations can compare their own organisation with other organisations with similar elements. At the moment the insurance company are receiving more information for the reason that they have to decide with what hospitals to negotiate'* (G2a, 2007).

Within the financial department and the administration the advantages of the DBC system are known and these departments think already more cost efficient. At the moment the products are identified and analysed to see if they have too much costs compared with the reimbursement. The medical specialists and the employees responsible for the primary costs are not so happy with the DBC system, because they are not aware of the advantages yet. *'The hospital does not have any plans to change the way of thinking of the specialists and the employees. But the organisation does hope that this way of thinking will change from 2008 on, because from that moment on the lump sum budget for the A-segment will disappear. When the lump sum budget is stopped the specialists are also more depended of the different DBCs, because these DBCs will set the honorarium'* (G2a, 2007).

The DBC system is seen as more complex then the functional budgeting system, because the different activities are linked with each others by the DBC system. By using the different functional budgeting system the activities are entered at different points and the output is set not linked to the different activities. In future there could be problems with entering data because there is an increase in information on treatments and diagnoses needed. At the moment it is important to create a stable DBC system, so it is possible for the hospitals to adjust to this system.

8.3 Analysis of the interviews

For having an overview what is stated in the different interviews and comparing this with each other a table is used to give a quick overview (A.9). In this section the different part of the table will be explained, like overhead costs, the ratio overhead and primary processes. Just as in the reports of the different interviews. But also the different implementation theories are set in the table, like the rational choice theory, social learning theory and the institutional theory. These theories are now separated to have a finer distinction between the different theories used in the literature overview. At last there is attention for the complexity of the system.

8.3.1 Change in overhead

The hospitals did not dedicate special attention for the overhead costs. Most of the time the overhead costs are part of the budget and the different divisions should keep track of the budgets and do not

exceed these. A few of the organisations have more focus on decreasing the budgets and they are also paying extra attention for not allowing divisions to exceed them.
For the implementation of the DBC system, some hospitals used external bureaus, other educated internal employees, but this did not have a different effect on the expenses for the DBC system. The hospitals which made own ICT applications did have extra overhead expenses, because there should also be someone who made the ICT application and they should pay for the application support itself. Also smaller hospitals had more direct overhead costs directly related to the implementation system, for the bigger hospitals this was not that clear, especially because the relative amount spent on the DBC system was lower. These bigger hospitals also had some extra FTE for the DBC system left, because of the digital efficiency made a few years before. And these hospitals also had more other extra overhead expenses like building extra properties or investing more in ICT, however they had more attention for cutting down the budget in total, including the overhead costs.

8.3.2 Change in the ratio overhead and primary processes

None of the hospitals had the idea that the overhead costs were increased in comparison with the primary costs. Some thought that it stayed the same, other thought that the primary costs increased more then the overhead costs, especially because of the extra expenditure for costly medicine and for hiring extra nursing personnel. Some hospitals had the feeling that because of the implementation of the DBC system the ratio did not decrease as much as it should have without implementing the DBC system.

8.3.3 Implementation of the DBC system

Most of the hospitals did have had common problems like set up problems and IT problems. The hospital with own application had most of the time more problems, because they had to invent every solution on their own, but the result was a more personalised IT programme. Hospital G1 started really early in 2002 with collection information on the DBC system and making a front office personalised what helped for implementing the system in 2005.

Rational choice theory

For most of the hospitals the goals of the implementation were clear. However some hospitals doubted whether it was useful to implement the system, especially the Academic hospitals. They thought that is was not that easy to calculate the cost prices because of the different tasks they have, and these tasks were also interrelated. The Academic hospitals thought that the lump sum budget would be better to operate a hospital, because there would be more attention for the quality of health care and education. They felt that the governmental organisations pressured them to implement the DBC system, while this was not in line with their own goals. This way of thinking could be seen in the frame of the article written by Senior (2002) on the hard system model. The Top clinic and General hospitals wanted more

transparency and they also wanted a system that linked the production and the reimbursement more. The hospitals which had decided to start with implementing the DBC system in the beginning, put more effort in calculating the cost prices and make use of these prices by analysing the products. Hospital T2 also knew the advantages of the system, but because of the recent merge they felt they were not ready for such a big change. But when they realised that the implementation was needed, they were positive about it. For the Top clinical and General hospital the problem and preferred option chosen by the governmental organisations was more in line with their own ideas and therefore the problems of the implementation where not the problematic (Senior, 2002).

The rational choice theory helped explained that the hospitals which were also more a like reacted differently to the implementation of the DBC system. The hospitals also had different view on the decision making process initiated by the department. The differences between the hospitals explain also the differences in the financial outcomes of the ratio overhead and primary processes.

Social learning theory

Most of the hospitals have created contact persons to ask questions to, or they have made a help desk. Some hospitals organised meetings for the contact persons to share there ideas and there problems to learn from each other. This could be seen as a learning trajectory (Cohen and Levinthal, 1990). The medical administration or the health care administration are mainly focussed on answering questions and they are also the persons contacting external parties if questions can not be answered or if they want to change parts of the system. Most hospitals use DBC onderhoud as an external company to ask question to, this works really well. Only for official changes it takes a lot of time and writing and the smaller hospitals do not have the power to get this done. Referring to the article of Grizzell (2003) it is possible to ask questions and to make changes internally, but the possibility to change the system itself is difficult. So the learning curve is mostly within the hospital and not external.

The hospitals needed to motivate the employees to enter the data in the system. Most of the hospitals did this by giving information and by organising meetings and training days. The Academic hospitals motivated the employees by telling them that the governmental organisation pressures the hospital and that it was needed to enter the data to receive reimbursements. Other hospitals tried to stimulate the employees more to see the benefits of the DBC system or they introduced more responsibilities and linking consequences on the agreements which where made. Others use training and education to create this awareness, by ranking the specialists on data entered for example. Or they use the payment of the specialists to put pressure to create more cost awareness. Some of the hospitals used non-financial measures to implement the system, just as Atkinson (1997) suggested or they used more material incentives, like cutting payments if they did not enter enough data, like Ginsburg (2005)

stated. However most of the actions were implemented to create a specific behaviour of action to benefit from this (Grizzell, 2003).

The social learning theory helps evaluating the different learning tools used by the hospitals to create a learning curve. When the learning curve is higher more efficiency could be realised what could influence the costs of the hospitals. By looking at the different tools, the different learning curves and efficiency rate could be explained. This could explain the difference in the financial results in the near future.

Institutional theory

For the Academic hospitals the implementation of the DBC system was not in line with the other goals set before. The Academic hospitals are focussing more on quality, research and education and less on the cost efficiency. However for the other hospitals the DBC system was more in line with their goals. For them it was important to have more focus on the cost price of every product to see what product to deliver and which not. They said that the introduction of the DBC system helped them to give more insight in how to make the organisation more transparent and fitter.

Most of the hospitals wanted to know how they where doing compared to other hospitals and hereby they use the data from Prismant. But they really want to have extra information for DIS, to see how they operate by using the DBC system. Because this data is missing most of the hospitals are mainly focusing on themselves. However the Academic hospitals are part of more meetings with other Academic hospitals. In these meeting they discuss how they can learn from each other, but they also compare the financial numbers. These hospitals are more focussed on the Academic group and how this group is performing. The Academic hospitals have more mimetic isomorphism, because they are copying each other more then the other hospitals (DiMaggio and Powell, 1991). But at the same time the Academic hospitals give different signals to the DIS than the Top clinic and General hospitals by saying they are different because of their other functions, but also by giving the data they are late or not complete. Hereby the Academic hospitals create a different coercive isomorphism than the Top clinic and General hospitals, by using informal pressure like combining their wishes to give data to the DIS (DiMaggio and Powell, 1991).

The institutional theory helps explaining the reasoning of the hospitals on how to implement the DBC system. Different reasoning is important here, did they just followed the rules, or did they act the way they always did. Another reason could be that they were mainly focussing on the other hospitals and how they acted and copy that. The different reason behind the action of implementation could lead to different implementations as well. By implementing the DBC system differently the results could be different as well, the institutional theory could explain these differences.

Internal environment

Looking at the different hospitals for thinking cost efficient, there is also a difference between the Academic hospitals and the Top clinic plus General hospitals. In the Academic hospitals the introduction of the DBC did not create more cost awareness than there already was. Quality of health care and education and research are most important, while in the Top Clinic and General hospitals there is more awareness of costs because of the implementation of the DBC system. Mostly because of the calculation of the different cost prices, what is not calculated at the Academic hospitals. At the Top clinic and General hospitals the financial and management departments are more aware of costs, than the specialists, but they are trying to change this to the whole hospital to think cost effective. Some of the hospitals expect that the specialists will think more cost effective when their payment is not lump sum anymore but also depending on the DBC input. The institution of the financial department is more focussed on cost efficiency, what is more related to the DBC system, then the institution of the specialists, which is more focussed on quality and patient care. There is a difference in normative isomorphism (DiMaggio, 1991). The Academic hospitals implemented the DBC system mostly to be sufficient for the formal rules, but not meeting the informal rules, this could be seen as decoupling (DiMaggio, 1991). The difference in interest between specialists and the managers (whereby managers is more driven by financial than clinical priorities) are seen in the research of Rundall (2004) (Scholten, 1998). While the focus of the Academic hospitals is mostly on clinical priorities, influenced by specialists, the focus of the Top Clinical and General hospitals is more balanced between financial and clinical priorities.

The research done on internal environment helps explaining the differences between the hospital management, who focus more on financial priorities and the specialists with extra focus on clinical priorities. This is also seen by interviewed hospitals; where some hospitals focussed more on the clinical priorities, mainly the Academic hospitals, and the Top clinical and General hospitals with more focus on the financial priorities. These differences also explained the different ways of implementation of the DBC system and the increase in cost awareness.

Complexity

All the hospitals thought that the DBC system is more complex than the functional budgeting system, because this system needs more data input. An example of this extra input is defining the diagnosis as well as the treatments. Most of the hospitals expect that the number of the DBC combinations will decrease to have a better overview on the system. Another wish is that the hospital information system and the DBC system can be more integrated, with the reason that the specialist only has to enter data once. Some hospitals already introduced their own front office to combine this data entry. The system is also more complex for the patient, because they have to deal with more information. A positive

aspect is that hospitals, like T1 and T2, realised that they have to have more focus on marketing, especially for the products in the B segment.

The complexity of the system is higher with the DBC system, than using the formal budgeting system, concluding from the different interviews. Hereby a raise in overhead costs can be expected, referring to the article from Eldenburg (2006) and Balakrisnan et all (1996) where is stated that the higher complexity is leading to more overhead, while more overhead is leading to a higher ratio overhead and primary processes. However, the hospitals do not state that the service intensity is higher since the implementation of the DBC system, so this variable is not causing higher costs in overhead, as stated in the article of MacArthur & Stanahan (1998).

8.4 Proposition

Looking at the hypothesis stated before on answering the question: 'What is the effect of DBC implementation on a hospital cost structure?' I predicted that the ratio would be positive because of the fact of extra complexity, extra costs for calculation of the cost price and also the implementation problems could lead to higher costs. Then looking at the results of the quantitative research the proposition is false, because the data show us a negative result of the ratio overhead and primary processes.

The results answer the question with a total decrease of 1,0 % for the ratio overhead costs / primary costs and 0,5% decrease for the ratio overhead costs / total costs. This is the contrary what the hypothesis was stated. When having a look at the data entered, the explanation for this decrease could be the high increase in costs for the primary processes. Many hospitals had high medicine costs and they also hired extra nursing personnel. The overhead costs grew as well, but not that much as the primary costs, what will result in a decreasing ratio.

The hospitals see this new system as more complex and thereby referring to the article of Balakrishan (1996), the overhead should increase. For most of the hospitals the overhead costs did increase, just as the articles on the DRG system show us (Cormwell, 1995; Eldenburg, 2000). But also other costs increased the overhead, like the electronic patient files a bit, but more the investments in other ICT projects and investments in new properties. But the extra overhead costs because of the implementation of the DBC system seen in the ratio overhead and primary processes is because of the fact that the costs for primary processes grew even more, especially for medicine costs and for nursing employees.

The extra costs for calculating the cost prices are not visible in every organisation, because some already did this in 2002 and other organisations did not do the calculation yet. For that reason these

costs are not directly seen in the overhead for every hospital, however when they do calculate these cost prices, there are costs involved calculating them. Also the reasoning that the differences in the percentages of the allocation of overhead per organisation can define the differences in the ratio overhead and primary processes is not directly seen by the organisations. Most of the hospitals do not use ABC to allocate the overhead costs, wherefore differences can not been noticed.

Different implementation theories did help to explain the differences in implementation of the DBC system, but not directly the ratio overhead and primary processes, because this would take a longer time. Looking at the rational choice theory, different hospitals which are similar should have consistent decision making given the same actions, preferences and options (Arrow, 1987). I found out that all the different hospitals more similar or not, did decided differently how to implement the DBC system. The differences in learning curve should explain the change in costs for the DBC system, because learning could lead to efficiency. This addition was given by the social learning theory (Cohen and Levinthal, 1990). Most of the hospitals did really put a lot of effort in the learning curve, not only by having contact persons to answer questions but also by doing training days and information sessions.

The interviews with the different managers made clear that there is no change in cost awareness yet. The financial departments do see the need of calculating the cost prices and adjust the business model to this, but the other divisions are not following yet. The hospitals are trying to change this by using incentives like; information, training and education, but also the threats of payment penalties to implement cost awareness into the whole organisation. It will take more time and money to change this within the whole organisation. This gap between the financial department and the other divisions can be explained, because the financial department is more used to think cost aware as institution, because of the literature they are reading and their educational background. The other divisions and mostly the specialists are used to the normative and official rules of having more attention for quality. The institutional theory is helpful, because it explains why hospitals divisions operate like they do, just because it is the way we do these things, or because of normative and official rules (DiMaggio, 1991). The institution focussed on quality has more attention in the Academic hospitals, where the cost efficiency still low is in the whole organisation.

In the internal environment there is a conflict of interest between the hospital itself and the medical specialists (Scholten, 1998). There is a difference in interest between specialists and the managers, whereby managers are more driven by financial than clinical priorities. Here the focus of the Academic hospitals is mostly on clinical priorities, influenced by specialists, is the focus of the Top Clinical and General hospitals more balanced between financial and clinical priorities. This could be improved by having more transparency in decision making (Rundall, 2004) or by the introduction of ‘co-makership’ (Scholten, 1998).

Chapter 9: Conclusion and recommendations

In this chapter of the thesis first a short introduction will be given, followed by a description of the problem statement and the research design. Then the different sub questions will be answered and also the final sub question will be answered: 'What recommendations can be stated based on the finding of this study?' But also the total research question will be answered and a reflection on the research will be given as well. But also the theoretical and practical limitations will be explained and future research possibilities will be discussed.

9.1 Introduction

Since 1 January 2005 hospitals are financed by the Diagnoses Treatment Combinations system (Diagnose Behandeling Combinaties, DBCs), this is a perspective payment system, whereby hospitals are financed for the products they make. The introduction of this system is in line with the movement called New Public Management, which applies to have more private management styles in the public sector.

The hospitals need to register the different DBCs for the B-segment and based on this they make the different invoices. The system used in the hospitals in the Netherlands, the DBC system, is very complex. (Steinbusch, 2006) This complexity can lead to higher overhead costs, stated by Balakrishnan (1996) en MacArthur & Stanahan (1998) This could lead to the possible result that hospitals have more attention for the invoice procedures and less for the core business, the primary processes itself, like surgery. This would be contrarily to the vision of the Dutch policy makers who have decided that there should be more attention and money to the primary processes and less to the overhead processes to create a tighter budget. (Hoogervorst, 2006)

9.2 Problem statement and research design

It is necessary to analyse the differences in the overhead and primary processes at the Dutch hospitals, because the Dutch government states that money should saved because of a declining overhead, but at the same time the department introduces the DBC system what could lead to extra overhead costs. Research on the effect of this system on the overhead and primary processes could lead to a conclusion that the department implements contradictory policies. This thesis will focus on the ratio of overhead and primary processes and if this ratio is changed by introducing this new system.

The focus of this thesis is more at the accounting perspective than the health care management perspective. At first a literature review is done looking at management accounting theories, but also implementation theories are used. For the empirical research of this thesis first a framework is developed by improving and combining different existing frameworks. The development of this framework used in this research is based on management accounting literature. The framework will be

used, by calculating the ratio overhead compared to primary processes and compared to total costs. This ratio will be calculated for all the 96 hospitals in the Netherlands using the annual reports of 2004 and 2005. From the population 6 hospitals are chosen to have interviews with the managers to do an in dept case research. By the selection of these hospitals, the different groups are taken in to account. For every group at least one hospital is selected to interview. The hospitals chosen from the three groups are those; which are the most far from the average ratio.

9.3 Sub questions answered

In this section the different sub questions are answered and give at the same time a short overview of the design of the thesis. The first sub question is *'What is the DBC system?'*

In January 2005 the DBC system was introduced in the Dutch hospitals. The DBC system is the whole of activities and treatments of a hospital and the medical specialist starting from the health care demand by the patient. DBCs are product types of the different products which a hospital can deliver. The DBC system is a market type mechanism to get the hospital sector more marktized, what influenced is by new public management. The goal of introducing this system is to have a market orientated mechanism that supplies more transparency and more awareness of the costs of the different products than the functional budgeting system, which is a lump sum budget. The DBC system is introduced to have better insight in the costs of products and the reimbursement. An additional benefit is that by introducing the DBC system several information systems can be linked to each other.

'How can the ratio overhead and primary processes in the hospitals in the Netherlands be defined?'

The ratio overhead and primary processes in the hospitals in the Netherlands can be defined by taking the total amount of overhead costs and divide this by the total amount of costs of the primary processes. The overhead ratio could also be calculated by taking the total amount of overhead costs and divide this by the total amount of costs. (Horngren, 2002)

'What are the expectations about the effect of the implementation of the DBC system on the ratio overhead and primary processes?'

This new system is more complex than the old functional budgeting system and also more complex then the DRG system. Higher rates of complexity will lead to higher overhead costs (Balakrishan, 1996). Other variables which could influence the overhead costs could be volume and service intensity (Eldenburg, 2006). So when the DBC system has higher values of these variables then the functional budgeting system, this could increase the overhead. This is also seen in the United States, where the overhead costs rose after implementing the DRG system (Cromwell, 1995). And also in Germany the DRG system was implemented in an attempt to contain costs, but after the implementation the actually cost savings has never occurred (Eldenburg, 2000). For the DBC system, a more complex system (Steinbusch, 2006), this could lead to higher overhead costs as well.

Another reason for higher overhead costs is that for the use of the system it is needed to calculate the cost price for every product. This process will need additional financial input (DBC onderhoud, 2006). By calculating the cost price the hospitals also need to calculate the overhead per product and use this in the cost price (Ramsey, 1994, Sulvetta, 1991). Most hospitals will use the Activity Based Costing system for this. However the hospitals will not be able to define every part of the overhead. The differences in the percentages of the allocation of overhead per organisation can define the differences in the ratio overhead and primary processes as well. The overhead could also be increased because of the introduction of the electronic patient files and the extra attention for corporate governance.

Different implementation theories could help explain the differences in implementation of the DBC system, but also the differences in the ratio overhead and primary processes. The rational choice theory gives us insight whether hospitals have consistent decision making given the same actions, preferences and options (Arrow, 1987). The question is whether they make choices based on information and whether every hospital makes the same choices if they are a like. The differences in learning curve could explain the change in costs for the DBC system, because learning could lead to efficiency. This addition is given by the social learning theory (Cohen and Levinthal, 1990). Institutional theories are helpful for this thesis, because it can explain why hospitals operate like they do, just because it is the way we do these things, or because of normative and official rules (DiMaggio, 1991). The institutional perspective proposes also that that many elements of organizational structure, like case-mix accounting systems, reflect as much a need to conform to societal expectations of acceptable practice as the technical imperative of fostering rationality (Covaleski 1993).

In the internal environment there is a conflict of interest between the hospital itself and the medical specialists. Hospital management had a say in the control of costs while the independent medical specialists, had the stimulus to produce more (Scholten, 1998). This is also seen in the reactions of the respondents, who were more likely to believe that hospital management is driven by financial than clinical priorities. This could be improved by having more transparency in decision making (Rundall, 2004) or by the introduction of ‘co-makership’ (Scholten, 1998).

‘How is the ratio between overhead and primary processes changed from 2004 or 2005?’

The results of using the framework to calculate the ratio between overhead and primary processes for 2004 or 2005, is that there was a total decrease of 1,0 % for the ratio overhead costs / primary costs and 0,5% decrease for the ratio overhead costs / total costs. When having a look at the data entered, the explanation for this decrease could be the high increase in costs for the primary processes. Many hospitals had high medicine costs and they also hired extra nursing personnel. The overhead costs grew as well, but not that much as the primary costs, what will result in a decreasing ratio.

'What is the role of the implementation of the DBC system on the ratio overhead and primary processes in the reality?'

Different implementation theories did help to explain the differences in implementation of the DBC system, but not explain directly differences in the ratio overhead and primary processes, because this would take much more time. Looking at the rational choice theory, different hospitals which are similar should have consistent decision making given the same actions, preferences and options (Arrow, 1987). However by having interviews I found out that all the different hospitals more similar or not, did decided differently how to implement the DBC system.

Most of the hospitals did really put a lot of effort in the learning curve, not only by having contact persons to answer questions but also by doing training days and information sessions. This costs a lot of money, but the real results will be seen in the future, hopefully. The differences in learning curve should explain the change in costs for the DBC system, because learning could lead to efficiency. This addition was given by the social learning theory (Cohen and Levinthal, 1990).

The interviews with the different managers made clear that the change to thinking more cost efficiency is not achieved yet. The financial departments do see the need of calculating the cost prices and adjusting the business model to this, but the other divisions are not following yet. The hospitals are trying to change this by using incentives like; information, training and education, but also the treats of payment penalties to implement cost awareness into the whole organisation. It will take more time and money to change this within the whole organisation. This gap between the financial department and the other divisions is because the financial department is more used to thinking cost efficient as institution, looking at the literature they read and their educational background. The other divisions and mostly the specialists are used to the normative and official rules of having more attention for quality. So the institutional theory is helpful for this thesis, because it can explain why hospitals divisions operate like they do, just because it is the way they do these things, or because of normative and official rules. (DiMaggio, 1991) The institutional perspective proposes that many elements of organizational structure, like case-mix accounting systems, reflect as much a need to conform to societal expectations of acceptable practice as the technical imperative of fostering rationality. (Covaleski 1993)

The final sub question *'What recommendations can be stated based on the finding of this study?'* will be answered in section 9.6 of this chapter after the reflection of the research.

9.4 Research question answered

Main research question: *'To what degree has the introduction of the DBC system affected the ratio overhead and primary processes the hospitals in 2004 and 2005 and how can this be explained?'* The

hospital cost structure changed from 2004 to 2005 with a decrease of one percent for the ratio overhead costs compared to the primary costs. There was a decrease of 0,5 percent for the ratio overhead costs divided by the total costs. So the cost structure did only have a small change, whereby there were relatively more primary costs. This was explained by the hospitals interviewed that the overhead costs increased, but the primary costs increased even more.

However the hospitals did report a lot of extra costs because of the implementation of the DBC system, mainly in high ICT costs but also for hiring extra people. Most of the hospitals could not redirect this to the overhead costs, especially because the hospitals do not really had special attention for the division overhead and primary costs. The smaller hospitals had more extra overhead costs because of the implementation of the DBC system than the bigger hospitals, because of the relative amount spent on the DBC system.

The Top clinical and General hospitals approached the implementation of the DBC system more active, for example with calculating the cost prices. Therefore they had extra expenses, but they also had more advantages of this by using the information in their strategies. The Academic hospitals are not willing to calculate the cost prices, because of the different and interrelated tasks and for that reason the DBC system was also not in line with their organisational goals.

For the Academic hospitals the implementation of the DBC system did not change much, they only have to enter the data in an extra system. But for the Top clinic and General hospitals the implementation of the DBC system also created more cost awareness. Thinking more cost efficient is at the moment mostly seen at the financial departments, but the organisations are trying to change this throughout the whole organisation. The organisations use information sessions, training days and education tools to create this awareness, but also ratings of cost efficient departments and the pressure of cutting specialist payments are used.

9.5 Reflection research

First of all this thesis provided extra literature on the DBC system by using the accounting perspective instead the health care management scope. This thesis gives insight in the change of the ratio overhead to primary costs since the implementation of the DBC system, but furthermore it also reflects to opinion of the different hospitals on the implementation of the DBC system. Most of the theories used are directly linked to accounting or to the ratio overhead and primary processes, these articles helped me making the framework for calculating the ratio's, but also gave accounting input for the proposition. But I also used some implementation theories. These theories were helpful to explain the differences between the different hospitals, for example the cost awareness difference between

Universal hospitals and Top clinic, General hospitals. The implementation theories helped me to ask questions on the implementation of the DBC system by the different hospitals.

The fact that I have chosen to do an archival study, by calculating the different ratios, but also doing a field study has enriched my thesis. The calculations gave me the basis to ask the different questions to the managers, but it also gave me an overview of costs for the Dutch hospital sector. But more important it helped to answer the first part of the research question, whether the ratio really changed or not. But the field study was also very useful, because it provided answer why the ratio has changed, but it also showed that between and within the hospitals differences are set, therefore it showed that is was not that easy to draw one straight conclusion, but to have a more diffuse opinion. It also showed more the people behind the numbers, what made it more interesting to do this research.

After doing this research my opinion is that the implementation of the DBC system is a success, especially for the hospitals which already were more focussed on costs, like the Top clinical hospitals and the General hospitals. Most of the hospitals still have to adjust and learn further to have a better result, what will be most effective if no large changes are made in the coming years. Only then it is clearer what the implementation of the DBC system has for an effect on the cost structure. However in the mean time there should be an understanding on the idea of the existence of different institutions within the hospitals as well as the difference between the hospitals. It was needed to evaluate the functional budget system and come to the conclusion that this system needed a revision. The functional budget system did not match production and revenue, so the motivation to produce more was not available. This system did not fit the vision of New Public Management and the social norm of this time.

For new large scale ‘grand designs’ in hospitals setting can be learned that when implementing top down, extra incentives, like training and information sessions, are needed to motivate the employees at the different levels of the hospitals. By implementing a new project there should also be time to implement the different changes before making new changes. At last there should not only be looked at the different calculations, but also to the institutions within the hospitals to adjust the implementation on this.

9.6 Recommendations

Because of the fact that this was a research with the main focus to investigate the implementation of the DBC system, the conclusions give no direct recommendations to improve parts of the system, or to give advice to the hospital organisations. However I did find some interesting information which could lead to recommendations, depending on choices.

If a hospital organisation wants to have a high level of knowledge on the DBC system, then an active approach (like gaining more knowledge and investing own funds) is helpful. By investing time and money into the system, more useful information will come out of it. This would also increase the learning curve. To create an active approach it is necessary to have high commitment throughout the whole organisation, especially from the top of the organisation, because the managers at the top can arrange resources and support.

If a hospital decided to have a custom made ICT package developed internally, then the hospital should also be aware of the fact that this will cost a lot of time, money and expertise to make this. It is important to have the sources and support to implement changes to the system accurate and fast. However when the sources are available a customised system is an advantage.

If the DIS has the goal to provide more transparency, then it is necessary to have stricter regulations for the hospitals how they hand in information. At the moment some hospitals hand in their cost prices, just as meant, but other organisations hand in sales prices. Here for the DIS is not able to label the outcome of the system and this will not increase transparency. The DIS should also provide the hospitals with more information in return to improve the transparency, but also to improve benchmarking between hospitals.

9.7 Limitations and further research

I applied a model across hospitals. However sometimes the model was not directly applicable in use, so some additional assumptions had to be made to make the ratio overhead and primary processes.

The model was focussed on dividing the different cost objects on overhead and primary processes; however this was not giving a complete view of the organisations overhead and primary processes, because sometimes in the different cost objects also a division could be made, to end up with a more perfect model to come to the ratios. When doing further research the possibility of doing research to the different costs of the hospital could have more attention. In this research the costs are split up by subject, but even within these subjects there could be more breakdowns to have an even better view on the ratios overhead and primary processes.

Another possibility of further research is to take more years into account. While doing this research the annual reports of the year 2006 were not available yet, but in a further research these reports can be taken into account as well, but also earlier years could be addressed. The annual report of 2006 could be interesting because by 66% of the hospitals was the implementation of the DBC software

completed in the middle of April in 2005. At 35% of the hospitals the implementation was in April 2005 not completed yet (Ernst & Young, 2006).

A future research direction consists of having a closer look at different parts of the organisation. There could be more focus on the departments of the hospitals and how this is comparable to other hospitals, instead of looking at the total hospitals. The research could be done for example for the neurology department, because this department is ahead of other department for cost calculation at many hospitals.

I selected a small number of hospitals to interview to explain the data I have found doing my archival study. This selection could be larger to increase external validation, but for the practical limitations like time and availability was it not possible to have a bigger selection.

At last a possibility for further research is looking more specific to the organisational changes within the hospitals. This could be a longitudinal study for organisational changes and comparing these changes with financial performance to give explanations. The focus for this research would be more on organisational change.

List of references

A1, (2006), 'Jaarverslag 2005 van het Leids Universitair Medisch Centrum'

A1a, (2007), Interview on hospital A1, 23 March 2007

A1b, (2007), Interview on hospital A1, 23 March 2007

A2, (2006), 'Jaarverslag 2005 van het Academisch Medisch Centrum'

A2a, (2007), 'Interview on hospital A2', 4 April 2007

Abernethy, M.A., Chua, W.F., Luckett, P.F., Selto, F.S., (1999), 'Research in managerial accounting: learning from others' experiences', Acc. Finance 39, 1-27

Alexander, J., Scott, W.R., (1984), 'The impact of regulation on the administrative structure of hospitals: toward an analytic framework', Hospital & Health Services Administration 29, 1984 no. 3: 71-85

Anderson, S., (1995), 'Measuring the impact of product mix heterogeneity on manufacturing overhead cost', the Accounting Review, 70 (3), 363-388

Anderson, T., (1995), 'ABC evolution: the next step for activity-based management', IIE Solutions, Jun 1995, 27,6 Abi/Inform Global, pg 26

Arrow K.J., (1987), 'Economic theory and the hypothesis of rationality,' The New Palgrave: A Dictionary of Economics, v. 2, pp. 69-75

Atkinson, A.A., Balakrishnan, R., Booth, P., Cote, JM., et al (1997), 'New directions in Management Accounting Research', Journal of Management Accounting Research, 9, Abi.Inform Global pg 79

Baarda, D.B., M.P.M. de Goede en J. Teunissen, (1995). 'Kwalitatief Onderzoek: praktische handleiding voor het opzetten en uitvoeren van kwalitatief onderzoek.', Stenfert Kroese, Groningen.

Balakrishnan, R.M, Gruca, T., Nath, D., (1996), 'The effect of service capability on operating costs: an empirical study of Ontario hospitals', Contemporary Accounting Research 13, (1), 177-206

Balakrishan, R.M, Petersen, M., & Soderstrom, N., (2004), 'Does capacity utilization affect the "stickiness" of cost?', Journal of Accounting, Auditing, and Finance, 1993), 283-299

Banker, Johnston, H., (1993), 'An empirical investigation of cost drivers in the U.S. airline industry', the Accounting Review, 68, (4), 576-601

Bomhoff, E., (2002), 'Positionering Algemene ziekenhuizen.', Ministerie Volksgezondheid, Welzijn en Sport, http://www.minvws.nl/images/2316795_tcm19-108919.pdf

Botz, CK., Sutherland, J., Lawrenson, (2006), 'Cost weight compression: impact of cost data precision and completeness', Health care financing review, spring 2006, volume 27, number 3

Bromwich, M., (1997), 'Accounting for overheads, critique and reforms', Acta universitatis Upsaliensis

CBS, (8 november 2006) 'Overhead in algemene ziekenhuizen gestegen', http://www.cbs.nl/nl-nl/menu/themas/mens-maatschappij/gezondheid-welzijn/publicaties/artikelen/2006-1904-wm.htm

Chan, Y.L., (1993), 'Improving hospital cost accounting with activity-based costing', Health Care Management Review, Winter 1993; 18, 1; ABI/ Inform Global pg 71

Cohen, W.M., Levinthal, D.A., (1990), 'Absorptive capacity: new perspectives on innovation and learning', Administrative Science Quarterly, 35,(2), 128-152

Commissie-de Beer, (2002) 'Nota minder regels, meer zorg', voor het Ministerie Volksgezondheid, Welzijn en Sport

Covaleski, M.A., Dirsmith, M.W., Michelman, J.E., (1993) , 'An institutional theory perspective on the DRG framework, case mix- accounting systems and health care organisations', Accounting, Organizations and Society, Vol. l & No. 1,pp. 65-R&19
Pegamon Press Ltd

Cromwell, J, Butrica, B., (1995), 'Hospital department cost and employment increases: 1980-92', Health care Financing Review: Fall 1995; 17,1, ABI/Inform Global pg 147

DBC onderhoud (2006), 'Wat is een DBC', www.dbconderhoud.nl , 10 januari 2006

DeCoster, D.T., et al., (1988), 'The use of budgetary symbols in the political arena: an historically informed field study', Accounting, Organizations and Society 13 (1), 1-24

DeJohn, P., (1999),'Seperating surgeons, materials mangers may be good selling strategy, reps report', Health Industry, Jun 1999; 62, 6

Deventer Ziekenhuis, (2006) 'Jaarverslag 2005'

Diaconessenhuis, (2006), 'Jaarverslag 2005'

DiMaggio, P. J., Powell,W.W.,(1991), 'The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields' published in P. J. DiMaggio &W.W. Powell (Eds.), The new institutionalism in organizational analysis (pp. 63-82). Chicago: University of Chicago Press.

DiMaggio, P. J., Powell,W.W, (1991), 'Introduction.' Pp. 1-38 in The New Institutionalism in Organizational Analysis, edited by Walter W. Powell and Paul J. DiMaggio. Chicago: University of Chicago Press.

DiMaggio, P.J., Powell,W.W., (1983). 'The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields.' American Sociological Review 48:147-160.

Dunleavy, P., Margetts, H., (2006), 'New public management is dead: Long live digital era governance', Journal of Public Administration Research and Theory

Ecorys-Nei, (2002) 'Tussen Bureau en Bed, een empirisch onderzoek naar de relatie tussen overhead en productie van Nederlandse ziekenhuizen.', in opdracht van het Ministerie Volksgezondheid, Welzijn en Sport

Eldenburg, L., (1994), 'The use of information in total cost management', the accounting review; Jan 1994; 69, 1; Abi/Inform Global pg 96

Eldenburg, L, Krishnan, R., (2006), 'Management Accounting and Control in Health Care: an Economic Perspective', University of Arizona, Michigan State University

Eldenburg, L, Kallapur, S., (2005), 'Uncertainty, Real Options, and Cost Behavior: Evidence from Washington State Hospitals', Journal of Accounting Research 43, 734-752

Eldenburg, L, Kallapur, S., (2000), 'The effect of changes in cost allocations on the assessment of cost containment regulation in hospitals, Journal of Accounting and Public Policy, 19, 97-112

Eldenburg, L, Kallapur, S., (1997), 'Changes in hospital service mix and cost allocations in response to changes in Medicare reimbursement schemes', Journal of Accounting and Economics, 23, 31-51

Eldenburg, L., Soderstrom, N., (1996), 'Accounting system management by hospitals operating in a changing regulatiory environment', The Accounting Review 71, 23-42

Ernst, C., Szczesny, A., (2005), 'Cost accounting implications of surgical learning in the DRG era', Schmalenbach Business review, ZFBF, April 2005, Abi/ Inform Global, pg 127

Ernst & Young (2006), 'Financiële Benchmark Algemene/ Topklinische/ Academische ziekenhuizen 2005', Eindhoven

Ernst & Young, (2005), 'Corporate governance bij ziekenhuizen – meting 2005, een periodiek onderzoek naar de status van corporate governance bij ziekenhuizen', Health care science, Amsterdam

Finkler, S.A., Henley, R.J., Ward, D.M., (2003), 'Evidence-based financial management', Healthcare Financial Management; October 2003; 57, 10; ABI/Inform Global pg 64

Finkler SA, Ward, DM., (1999), 'Cost Accounting for health care organizations.' Aspen, Gaithersburg

Finkler, S.A., Ward, D.M., (2003), 'The case for the use of evidence-based managment research for the control of…', Health Care Management Review, Oct-Dec 2003; 28, 4; ABI/Inform Global pg 348

G1, (2006), 'Jaarverslag 2005 van het Van Weel Bethesda Ziekenhuis'

G1a, (2007), 'Interview on hospital G1', 2 April 2007

G2, (2006), 'Jaarverslag 2005 van 't Lange Land Ziekenhuis'

G2a, (2007), 'Interview on hospital G2', 26 March 2006

Gelre ziekenhuis, (2006), 'Jaarverslag 2005'

Ginsburg, P.B., (2005), 'Competition In Health Care: Its Evolution Over The Past Decade', Health Affairs. Chevy Chase: Nov/Dec 2005. Vol. 24, Iss. 6, p. 1512-1522 (11 pp.)

Ginsburg, P, (1998), 'Health system change in 1997', Health Affairs, Jul/Aug 1998, 17, 4, Abi/Inform Global, pg 165

Grizzell, J., (2003), 'Behaviour change theories and model', Fellow - American College Health Association

Hakvoort, J.L.M., Klaassen, H.L, (2004) 'Bedrijfsvoeringtechnieken voor overheid en non-profitorganisaties', Sdu uitgevers, Den Haag

Hall, P. (1993), "Policy Paradigms, Social Learning, and the State: The Case of Economic Policymaking in Britain", Comparative Politics, Vol. 25, No. 3. (Apr., 1993), pp. 275-296

Hall, P. & R. Taylor, (1996),'Political Science and the Three New Institutionalisms, in: Political Studies', Vol. 44, 1996, pp. 936-957.

Hedberg, B., (1981), 'How organisations learn and unlearn', Handbook of organizational Design, edited by P.C. Nystrom, and W.H. Starbuck, 3-27, Oxford, U.K., Oxford University Press

Hoogervorst, H., (2006), 'Bureaucratie in ziekenhuizen', Ministerie Volksgezondheid, Welzijn en Sport, http://www.minvws.nl/kamerstukken/meva/2006/bureaucratie-in-ziekenhuizen.asp

Horngren CT., (1982) 'Cost accounting', Prentice-Hall, Englewoord Cliffs

Horngren, C.T., (1982), 'Cost accounting a managerial emphasis', 5th edition, Englewood Cliffs.

Horngren, C.T., Bhimani, A., Datar, S.M., Foster, G., (2002) 'Management and Cost Accounting', Prentice Hall, 2nd Edition

Huijben, M., Geurtsen, A, (2006), 'Omvang bij publieke organisaties: op zoek naar een norm.', Berenschot

Huijben, M., (2003), 'Reportage benchmark overhead bij universiteiten en hogescholen', Berenschot

Humphrey, C., Scapens, R.W., (1996), 'Theories and case studies of organizational accounting practices: limitation or liberation?' Acc. Aud. Accountability J. 9(4), 86-106

Kaplan, R.S., Atkinson, A.A., (1998) 'Advanced management Accounting', Prentice hall, 3rd Edition

't Lange Land Ziekenhuis (2006) 'Jaarverslag 2005'

Langwell, K., (1993), 'Price controls: On the one hand… and on the other', Health Care Financing Review; Spring 1993; 14,3 ABI Inform Global p 5.

Latimer E.A., Kane, N.M., (1995), 'Practice expenses in the MFS: The service-class approach', Health Care Financing Review. Washington: Spring 1995. Vol. 16, Iss. 3; pg. 197

Lewin and Associates, Inc. (1976), 'A Study of Investor-Owned Hospitals', Chicago: Healtch Services Foundation

Lewin and Associates, Inc., (1981), 'Studies in the Comparative Performance of Investor-Owned and Not – For – Profit Hospitals', Washington DC: Vol. 1. Industry Anaslysis: 8-9

MacAurthur, J., Stranahan, H. (1998), 'Cost driver analysis in hospitals: a simultaneous equations approach', Journal of Management Accounting Research

Maher, M., & Marais, L. (1998), 'A field study on the limitations of activity-based costing when resources are provided on a joint and indivisible basis', Journal of Accounting Research, 36 (1), 129-142

McKay, N.L., Harris Lemak, C. (2006),'Analyzing Administrative Costs in Hospitals', Health Care Management Review, October December 2006

Medisch Spectrum Twente, (2006), 'Jaarverslag 2005'

Ministerie van Volksgezondheid, Welzijn en Sport, (2005), 'De introductie van DBC's en administratieve lasten'

Ministerie Volksgezondheid, Welzijn en Sport, (2004) 'Ziekenhuizen gaan extra zorg leveren', http://www.minvws.nl/persberichten/cz/extra_zorg.asp

Ministerie Volksgezondheid, Welzijn en Sport, (2006), www.jaarverslagenzorg.nl

Modell, S., (2005),'Triangulation between case study and survey methods in management accounting research: an assessment of validity implications', Management Accounting research 16, 231-254

Noreen, E., Soderstrom, N. (1997), 'The Accuracy of Proportional Cost Models: Evidence from Hospital Service Departments.' Review of Accounting Studies **2**(1): 89-114

Noreen, E., & Soderstrom, N. (1994), 'Are overhead costs strictly proportional to activity? Evidence from hospital service departments', Journal of Accounting and Economics, 17, 255-278

Ong, B.N., Boaden, M. and Cropper, S. (1997), "Analysing the medicine-management interface in acute trusts", Journal of Management in Medicine, Vol. 11 No. 2, pp. 88-95

Oostenbrink, J.B., Rutten, F.F.H., (2006), 'Cost assessment and price setting of inpatient care in the Netherlands. The DBC case-mix system', Health Care Management Science, 9: 287-294

Pateon, R.A., McCalman, J., (2002),'Change management, a Guide to Effective Implementation', London, Sage

Pierson, P. (2002),'Increasing Returns, Path Dependency, and the Study of Politics, in: American Political Science Review, Vol. 94, 2000, pp. 251-267.

Pollitt, C., Bouckaert, G., (2004), 'Public Management Reform, a comparative analysis', Oxford university press

Poullier, JP., (1992), 'Administrative Costs in Selected Industrialized Countries', Health Care Financing Review, SUmmer 1992; 13;4; ABI/Inform Global, pg, 167

Project DBC (2003) 'Kaderregeling Administratieve Organisatie en Interne Controle inzake DBC registratie en facturering', Utrecht, 7 november 2003

Prospective Payment Assessment Commission (1992), 'Medicare and the American healthe care system', Report to Congress, Commerce Clearing House, Chicago, Il.

Ramsey, RH., (1994), 'Activity-based costing for hospitals', Hospital & Health Services Administration. Chicago: Fall 1994. Vol. 39, Iss. 3; pg. 385

Reinhardt, U., (1996), 'Perspective: spending more through 'cost control'', Health Affaires, summer 1996, 15, 2, Abi/ Inform global, pg 145

Reinier de Graaf groep, (2006), 'Jaarverslag 2005'

Ross, T.K. (2004), 'Analyzing health care operationgs using ABC'. Journal of health Care Finance 30 (3), 1-20

Rundall, T.G., Davies, H.T.O., Hodges, CL. Daimond, M., (2004), 'Doctor-Manager Relationships in the United States and the United Kingdom', Journal of Healthcare Management, Jul/ Aug 2004; 49, 4

Ryan, B., Scapens, R.W., Theobald, M., (2002), 'Research Method and Methodology in Finance and Accounting', second ed. Thomson, Padstow

Schaepkens, DDJM, Zuurbier, JJ., (2002) 'DBC van registratie tot besturing', NTMA, april 2002

Scholten, G.R.M., Grinten van der, T.E.D, (1998), 'Between physician and manager: new co-operation models in Dutch hospitals', Journal of Management in Medicine, Bradford, Vol.12, Iss 1 pg 33

Schroeder, R., Van de Ven, A., (1986), 'Managing innovation and change: finding from the Minnesota innovations research program', Agribusiness 2(4), 501-523

Scott, RW. (2001), 'Institutions and Organizations', 2nd ed. Thousand Oaks: Sage Publications.

Sen, A., (1987), 'Rational behaviour', The New Palgrave: A Dictionary of Economics, v. 3, pp. 68-76

Senior, B., (2002), 'Organisational Change', Financial times, Prentice Hall, Edinburg Gate

Shukla, R.K. Pestian, J., Clement, J., (1997), 'A comparative analysis of revenu and cost-management strategies of Not-for-Profit and For-Profit Hospitals', Hospital & Health Services Administration; Spring 1997; 42, 1; ABI/ Inform Global pg 117

Sint Elisabeth Ziekenhuis, (2006) 'Jaarverslag 2005'

Sneller beter (7 november 2006) 'De noodzaak tot verandering: betaalbaarheid', http://www.snellerbeter.nl/fileadmin/snellerbeter/documenten/rapporten/SB_KPN_BijlageP09-16.pdf

Snibbe, A.C., (2006) 'Overhead isn't everything', Stanford Social Innovation Review; Fall 2006 p15

Soderstrom, N., Eldenburg, L., Ernst, C., (2006), 'Investigating Accounting Issus and Incentives in a DRG setting', BFuP; Nov/ Dec 2006; 58, 6, ABI/ Inform Global pg 618

Spaarne Ziekenhuis, (2006), 'Jaarverslag 2005'

Starbuck, W.H.A., Greve, Hedberg, B., (1987), 'Responding to crisis', Journal of Business Administration, 111-137

Steinbusch, P., Oostenbrink, JB., Zuurbier, JJ, Schaepkens, FJM., (2006), 'The risk of upcoding in casemix systems: a comparative study.', Health Policy,

Sulvetta, M.B., (1991), 'Achieving Cost Control in the Hospital Outpatient Department', Health Care Financing Review, 1991, ABI/Inform Global, pg 95

T1, (2006), 'Jaarverslag 2005 van het Medisch Centrum Haaglanden'

T1a, (2007), Interview on hospital T1, 21 March 2007

T2, (2006), 'Jaarverslag 2005 van Alysis Zorggroep

T2a, (2007), 'Interview on hospital T2', 5 April 2007

Thorley, N., Johns, E.L., (1994), 'Adoption of costing systems by U.S. hospitals', Hospital & Health Services Administration; Winter 1994; 39, 4; ABI/ Inform Global pg. 521

Tweesteden ziekenhuis, (2006), 'Jaarverslag 2005'

Upda, S., (1996), 'Activity-based costing for hospitals', Health Care Management Review; Summer 1996; 21, 3; ABI/Inform Global pg 83

Van de Ven, A., (1986), 'Central problems in the management of innovation', Management Science, 32, (5), 590-607

Van de Ven, A., (1992), 'Suggestions for studying strategy-process: a research note', Strategic Management Journal, 13: 169-188

Van de Ven, A., Angle, H.L., Poole, M.S., (1989), 'Research on the Management of Innovation: the Minnesota Studies', New York, NY: Harper & Row

Zuurbier, JJ., Groot de, M., Spanjes, R., (2003), 'Casemixmanagement: werken met diagnose-behandelingscombinaties', SFB, 76 / FBZ 17/11

Zuurbier, JJ, Steinbusch, P., (2006), 'Episode based hospital reimbursement based on cost accounting: methodology and results', Department IBMG Healthcare management, Erasmus University Medical centre

Appendix

Table A.1: The framework used this research

Table A.1: The framework used this research

Personnel costs	
Primary costs	Overhead costs
Production functions	General functions
Distribution functions	General support functions
Health care service functions	Administrative functions
Medical electronical functions	Hotel functions
Medical analysis functions	Management and staff functions
Treatment and treatment support functions	Functions personnel & organisation
Psycho social treatment functions	Area and building functions
Nursing and educational functions	Technical support functions
Medical and social scientific functions	ICT functions
Nursing functions in education	
Trainee / internship functions	
Total personnel costs *Ratio overhead costs / primary costs* *Ratio overhead costs / total costs*	
Depreciation costs	
Primary costs	Overhead costs
Subsequent calculation of depreciation	Other depreciation immaterial assets
Other depreciation material fixed assets	Depreciation for impairment
Depreciation inventory	Depreciation for financial assets
Depreciation leased inventory	Depreciation for automation
	Depreciation for maintenance investments
	Depreciation for withdraw
	Allocation to equalize
Total depreciation costs *Ratio overhead costs / primary costs* *Ratio overhead costs / total costs*	
Other operating costs	
Primary costs	Overhead costs
Nutrition costs	Hotel costs
Patient related costs	General costs
	Area and building costs
	Maintenance and energy costs
	Rent and lease costs
	Alliance costs
	Allocation provision
Total operating costs *Ratio overhead costs / primary costs* *Ratio overhead costs / total costs*	
Total financial costs **Total operating costs** *Ratio overhead costs / primary costs* *Ratio overhead costs / total costs*	

Table A.2: Names of the selected hospitals

Table A.2: Names of the selected hospitals

University Medical Centre	
LUMC	Leids Universitair Medisch Centrum
UMCG	Universitair Medisch Centrum Groningen
UMCN	Universitair Medisch Centrum Nijmegen
EMC	Erasmus Medisch Centrum
UMCU	Universitair Medisch Centrum
AMC	Academisch Medisch Centrum bij de Universiteit van Amsterdam
VUMC	Vrije Universtiteit Medisch Centrum
AZM	Academsich Ziekenhuis Maastricht
Top clinical hospital	
RDG	Reinier de Graaf Groep
AZA	Alysis Zorggroep
MCH	Medisch Centrum Haaglanden
SEZ	Sint Elisabeth Ziekenhuis
JBZ	Jeroen Bosch Ziekenhuis
HZ	Haga ziekenhuis
SLA	Sint Lucas Andreas Ziekenhuis
IKZ	Isala klinieken
ZNL	Zorggroep Noorderbreedte Leeuwarden
GOZL	Gezondheidszorg Oostelijk Zuidlimburg
MST	Medisch Spectrum Twente
OLVG	Onze Lieve Vrouwe Gasthuis
CZE	Catharina Ziekenhuis
MCA	Medisch Centrum Alkmaar
SAZ	St. Antonius Ziekenhuis
MMC	Maxima Medisch Centrum
CWZ	Canisius - Wilhelmina Ziekenhuis
MZG	Martini Ziekenhuis
DZD	Deventer Ziekenhuis
Algemene ziekenhuizen	
LLZ	T Lange Land Ziekenhuis
RKZ	Rode Kruis Ziekenhuis
VZS	Vlietland Ziekenhuis
VWB	Van Weel-Bethesda Ziekenhuis
DLL	Diaconessenhuis
SAL	Stichting Alatus
WZP	Waterland Ziekenhuis
SFG	Sint Franciscus Gasthuis
ZHH	Ziekenhuis Hilversum
IJZC	Ijsselland Ziekenhuis
AZB	Amphia Ziekenhuis

ASZ	Albert Schweitzer Ziekenhuis
OMZ	Orbis Medisch en Zorg concern
LZR	Sint Laurentius Ziekenhuis
DTZ	De Tjongerschans Ziekenhuis
ZLB	Ziekenhuis Lievensberg
MZB	Maasziekenhuis Pantein
ZBO	Ziekenhuis Bernhoven
SZH	Spaarne Ziekenhuis
HZR	Haven ziekenhuis
WZA	Wilhelmina ziekenhuis
GZZ	Gelre ziekenhuizen
ALZ	Antoni van Leeuwenhoek ziekenhuis
OZG	Oosterschelde ziekenhuis
RPZ	Ruwaard van Putten ziekenhuis
MCR	Medisch Centrum Rijnmond Zuid
ZTA	Ziekenhuisgroep Twente
MCM	Meander Medisch Centrum
RZG	Rivas Zorggroep
KGH	Kennemer Gasthuis
ZSE	Zorggroep Sudevelt, Scheper Ziekenhuis
ZVV	Stichting Ziekenhuizen Noord Limburg
ZGV	Ziekenhuis Gelderse Vallei
SDU	Stichting Diakonessenhuis
TSZ	Tweesteden Ziekenhuis
WGH	Westfries Gasthuis
GHZ	Groene Hart Ziekenhuis
DMM	Diaconnessenhuis Meppel
DHZ	Zaans Medich Centrum de Heel
ZZV	Ziekenhuisgroep Zeeuwsch-Vlaaanderen
SZD	Slingeland Ziekenhuis
EZH	Elkerliek Ziekenhuis
SAZ	St. Anna Ziekenhuis
MSU	Mesos Medisch Centrum
STZ	R.K. Ziekenhuis Sint Franciscus
ZBH	Ziekenhuis Bronovo
ZGN	Streekziekenhuis Gooi-Noord
IJZL	Ijsselmeerziekenhuizen
BZH	Ziekenhuis Bethesda
FZA	Flevoziekenhuis
SJZ	Ziekenhuis (Noordwest-Veluwe) St. Jansdal
ZRT	Ziekenhuis Rivierland
AZS	Antonius Ziekenhuis
SCH	Streekziekenhuis Coevorden Hardenberg
ZIR	Prot. Chr. Ziekenhuis Ikazia

ZNS	Prot. Chr. Ziekenhuis Nij Smellinghe
ZWV	Ziekenhuis Walcheren
GDH	Gemini Ziekenhuis
BIJZ	Boven IJ Ziekenhuis
ZOA	Ziekenhuis Oost Achterhoek
SJG	Sint Jans Gasthuis
HZW	Hofpoort Ziekenhuis
ZTS	zorgvoorziening Talma Sionsberg
ZAA	Ziekenhuis Amstelveen
RZS	Prot. Chr. Refaja Ziekenhuis
DZ	Delftzicht Ziekenhuis
SLZ	Sint Lucas Ziekenhuis
SZA	Slotervaartziekenhuis

Table A.3: Results University medical centre

Table A.3: Results University medical centre

Hospital	LUMC			UMCG		
Year / change	2004	2005	Δ	2004	2005	Δ
Personnel costs						
Ratio overhead costs / primary costs	24,67%	22,63%	-2,04%	58,04%	58,29%	0,24%
Ratio overhead costs / total costs	49,39%	48,42%	-0,97%	36,73%	36,82%	0,10%
Depreciation costs						
Ratio overhead costs / primary costs	6,56%	6,40%	-0,17%	31,12%	29,08%	-2,04%
Ratio overhead costs / total costs	6,16%	6,01%	-0,15%	23,74%	22,53%	-1,20%
Other operating costs						
Ratio overhead costs / primary costs	58,39%	51,36%	-7,03%	45,89%	49,23%	3,34%
Ratio overhead costs / total costs	36,86%	33,93%	-2,93%	31,46%	32,99%	1,53%
Total						
Ratio overhead costs / primary costs	32,50%	29,43%	-3,07%	39,41%	40,67%	1,27%
Ratio overhead costs / total costs	39,96%	37,80%	-2,16%	27,30%	28,02%	0,72%

Hospital	UMCN			EMC		
Year / change	2004	2005	Δ	2004	2005	Δ
Personnel costs						
Ratio overhead costs / primary costs	38,48%	42,23%	3,74%	48,46%	48,46%	0,00%
Ratio overhead costs / total costs	27,79%	29,69%	1,90%	32,64%	32,64%	0,00%
Depreciation costs						
Ratio overhead costs / primary costs	89,71%	95,90%	6,19%	16,03%	23,86%	7,83%
Ratio overhead costs / total costs	47,29%	48,95%	1,67%	13,82%	19,27%	5,45%
Other operating costs						
Ratio overhead costs / primary costs	57,26%	49,34%	-7,92%	61,78%	60,57%	-1,21%
Ratio overhead costs / total costs	36,41%	33,04%	-3,37%	38,19%	37,72%	-0,47%
Total						
Ratio overhead costs / primary costs	53,91%	57,17%	3,26%	50,19%	50,25%	0,06%
Ratio overhead costs / total costs	35,03%	36,38%	1,35%	33,19%	33,21%	0,03%

Hospital	UMCU			AMC		
Year / change	2004	2005	Δ	2004	2005	Δ
Personnel costs						
Ratio overhead costs / primary costs	9,51%	9,23%	-0,28%	54,89%	54,89%	0,00%
Ratio overhead costs / total costs	8,69%	8,45%	-0,24%	35,44%	35,44%	0,00%
Depreciation costs						
Ratio overhead costs / primary costs	36,38%	27,58%	-8,80%	40,36%	27,00%	-13,36%
Ratio overhead costs / total costs	26,68%	21,62%	-5,06%	28,75%	21,26%	-7,49%
Other operating costs						
Ratio overhead costs / primary costs	47,42%	58,16%	10,74%	52,31%	52,09%	-0,22%
Ratio overhead costs / total costs	32,17%	36,77%	4,61%	34,34%	34,25%	-0,10%
Total						
Ratio overhead costs / primary costs	20,50%	23,60%	3,10%	52,96%	51,88%	-1,08%
Ratio overhead costs / total costs	17,80%	20,08%	2,27%	34,30%	33,87%	-0,43%

Hospital	VUMC			AZM		
Year / change	2004	2005	Δ	2004	2005	Δ
Personnel costs						
Ratio overhead costs / primary costs	42,77%	40,67%	-2,10%	40,10%	40,51%	0,41%
Ratio overhead costs / total costs	29,96%	28,91%	-1,05%	28,62%	28,83%	0,21%
Depreciation costs						
Ratio overhead costs / primary costs	33,43%	38,71%	5,28%	20,99%	19,57%	-1,42%
Ratio overhead costs / total costs	25,05%	27,91%	2,85%	17,35%	16,37%	-0,98%
Other operating costs						
Ratio overhead costs / primary costs	65,24%	85,23%	20,00%	45,80%	52,66%	6,85%
Ratio overhead costs / total costs	39,48%	46,01%	6,53%	31,41%	34,49%	3,08%
Total						
Ratio overhead costs / primary costs	46,73%	49,72%	2,99%	40,46%	42,46%	2,00%
Ratio overhead costs / total costs	31,41%	32,80%	1,39%	28,17%	29,17%	1,00%

Hospital	Average		
Year / change	2004	2005	Δ
Personnel costs			
Ratio overhead costs / primary costs	39,62%	39,61%	0,00%
Ratio overhead costs / total costs	31,16%	31,15%	-0,01%
Depreciation costs			
Ratio overhead costs / primary costs	34,32%	33,51%	-0,81%
Ratio overhead costs / total costs	23,60%	22,99%	-0,61%
Other operating costs			
Ratio overhead costs / primary costs	54,26%	57,33%	3,07%
Ratio overhead costs / total costs	35,04%	36,15%	1,11%
Total			
Ratio overhead costs / primary costs	42,08%	43,15%	1,07%
Ratio overhead costs / total costs	30,89%	31,42%	0,52%

Table A.4: Results Top clinical hospitals

Table A.4: Results Top clinical hospitals

Hospital				RDG				AZA		
Year / change				2004	2005	Δ		2004	2005	Δ
Personnel costs										
Ratio overhead costs / primary costs				37,38%	34,41%	-2,97%		41,24%	38,04%	-3,20%
Ratio overhead costs / total costs				27,21%	25,60%	-1,61%		29,20%	27,56%	-1,64%
Depreciation costs										
Ratio overhead costs / primary costs				12,58%	11,77%	-0,81%		11,87%	11,86%	-0,01%
Ratio overhead costs / total costs				11,18%	10,53%	-0,65%		10,61%	10,60%	-0,01%
Other operating costs										
Ratio overhead costs / primary costs				48,77%	50,96%	2,20%		51,17%	54,42%	3,25%
Ratio overhead costs / total costs				32,78%	33,76%	0,98%		33,85%	35,24%	1,39%
Total										
Ratio overhead costs / primary costs				38,02%	37,18%	-0,84%		41,36%	40,52%	-0,84%
Ratio overhead costs / total costs				23,34%	23,01%	-0,32%		29,26%	28,84%	-0,43%

MCH			**SAZ**			**JBZ**		
2004	**2005**	**Δ**	**2004**	**2005**	**Δ**	**2004**	**2005**	**Δ**
36,72%	34,20%	-2,52%	40,93%	45,19%	4,26%	32,32%	36,32%	3,99%
26,86%	25,48%	-1,38%	29,04%	31,12%	2,08%	24,43%	26,64%	2,21%
7,78%	2,27%	-5,5%	4,22%	1,74%	-2,47%	10,04%	13,54%	3,50%
10,42%	2,96%	-7,47%	4,05%	1,71%	-2,33%	9,12%	11,82%	2,69%
95,02%	84,61%	-10,41%	43,18%	41,73%	-1,45%	87,61%	87,06%	-0,54%
48,72%	45,83%	-2,89%	30,16%	29,44%	-0,71%	46,70%	46,54%	-0,15%
49,01%	43,41%	-5,60%	38,49%	40,10%	1,60%	44,22%	47,66%	3,44%
32,89%	30,27%	-2,62%	26,59%	27,63%	1,04%	26,43%	28,49%	2,06%

HZ			**SLA**			**IKZ**		
2004	**2005**	**Δ**	**2004**	**2005**	**Δ**	**2004**	**2005**	**Δ**
33,71%	32,33%	-1,38%	43,45%	42,40%	-1,05%	39,38%	36,69%	-2,69%
25,21%	24,43%	-0,78%	23,55%	23,24%	-0,31%	28,25%	26,84%	-1,41%
14,43%	34,39%	19,97%	21,24%	14,70%	-6,54%	4,18%	3,08%	-1,10%
12,61%	25,59%	12,98%	17,52%	12,82%	-4,70%	4,01%	2,99%	-1,02%
64,82%	60,82%	-4,00%	79,40%	67,50%	-11,90%	34,74%	29,16%	-5,59%
39,33%	37,82%	-1,51%	44,26%	40,30%	-3,96%	25,78%	22,57%	-3,21%
40,87%	40,55%	-0,31%	50,95%	43,98%	-6,97%	35,30%	31,83%	-3,46%
28,22%	28,13%	-0,09%	30,69%	27,71%	-2,98%	25,56%	23,74%	-1,82%

ZNL			GOZL			MST		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
33,08%	34,59%	1,51%	35,24%	29,52%	-5,72%	30,64%	28,77%	-1,86%
24,86%	25,70%	0,84%	26,06%	22,79%	-3,26%	23,45%	22,34%	-1,11%
1,31%	4,55%	3,24%	47,31%	42,48%	-4,83%	25,93%	12,97%	-12,95%
1,29%	4,35%	3,06%	32,12%	29,81%	-2,30%	20,59%	11,48%	-9,10%
63,65%	57,12%	-6,52%	46,48%	45,73%	-0,75%	45,44%	45,19%	-0,25%
38,89%	36,36%	-2,54%	31,73%	31,38%	-0,35%	31,24%	31,13%	-0,12%
37,48%	36,61%	-0,87%	39,23%	34,99%	-4,25%	30,64%	28,78%	-1,87%
25,97%	25,48%	-0,48%	27,47%	25,31%	-2,16%	22,41%	21,37%	-1,04%

OLVG			CZE			MCA		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
34,85%	35,97%	1,13%	46,46%	47,05%	0,59%	27,72%	32,76%	5,03%
25,84%	26,46%	0,61%	31,72%	32,00%	0,27%	21,71%	24,67%	2,97%
11,40%	21,74%	10,34%	12,03%	10,45%	-1,58%	26,48%	27,99%	1,52%
10,23%	17,86%	7,62%	10,74%	9,46%	-1,28%	20,93%	21,87%	0,94%
53,72%	40,86%	-12,86%	31,66%	29,70%	-1,96%	62,10%	58,36%	-3,74%
34,95%	29,01%	-5,94%	24,05%	22,90%	-1,15%	38,31%	36,85%	-1,46%
38,33%	36,47%	-1,86%	37,47%	36,37%	-1,10%	36,15%	39,34%	3,19%
26,69%	25,96%	-0,73%	26,51%	26,05%	-0,45%	26,53%	28,23%	1,70%

SAZ			MMC			CWZ		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
42,71%	42,55%	-0,15%	32,36%	31,80%	-0,56%	32,24%	30,58%	-1,65%
29,93%	29,85%	-0,08%	24,45%	24,13%	-0,32%	24,38%	23,42%	-0,96%
13,57%	11,93%	-1,64%	4,59%	5,23%	0,64%	8,03%	8,46%	0,44%
11,95%	10,66%	-1,29%	4,39%	4,97%	0,58%	7,43%	7,80%	0,37%
33,78%	28,84%	-4,94%	36,06%	37,02%	0,96%	63,13%	53,22%	-9,91%
25,25%	22,38%	-2,87%	26,50%	27,02%	0,52%	38,70%	34,73%	-3,97%
37,44%	35,00%	-2,44%	30,64%	30,61%	-0,04%	38,97%	35,20%	-3,77%
26,47%	25,36%	-1,12%	22,72%	22,74%	0,02%	27,29%	25,34%	-1,95%

MZG			DZD			Average		
2004	**2005**	**Δ**	**2004**	**2005**	**Δ**	**2004**	**2005**	**Δ**
30,82%	32,43%	1,60%	31,88%	34,05%	2,17%	35,95%	35,77%	-0,18%
23,56%	24,49%	0,93%	24,17%	25,40%	1,23%	25,99%	25,90%	-0,09%
18,75%	16,87%	-1,88%	0,79%	0,65%	-0,14%	13,50%	13,51%	0,01%
15,79%	14,44%	-1,36%	0,78%	0,64%	-0,14%	11,36%	11,18%	-0,18%
36,89%	34,09%	-2,80%	34,73%	33,85%	-0,88%	53,28%	49,49%	-3,80%
26,95%	25,42%	-1,53%	25,78%	25,29%	-0,49%	33,89%	32,31%	-1,58%
32,05%	31,82%	-0,23%	30,11%	31,16%	1,05%	38,25%	36,93%	-1,32%
23,66%	23,36%	-0,29%	22,60%	23,08%	0,48%	26,38%	25,80%	-0,59%

Table A.5: Results General hospitals

Table A.5: Results General hospitals

Hospital	LLZ			RKZ		
Year / change	2004	2005	Δ	2004	2005	Δ
Personnel costs						
Ratio overhead costs / primary costs	39,74%	38,15%	-1,59%	21,65%	19,23%	-2,42%
Ratio overhead costs / total costs	28,44%	27,61%	-0,82%	17,80%	16,13%	-1,67%
Depreciation costs						
Ratio overhead costs / primary costs	23,60%	21,74%	-1,86%	27,67%	30,67%	3,01%
Ratio overhead costs / total costs	19,10%	17,86%	-1,24%	21,67%	23,47%	1,80%
Other operating costs						
Ratio overhead costs / primary costs	71,35%	56,14%	-15,21%	68,81%	59,28%	-9,53%
Ratio overhead costs / total costs	41,64%	35,96%	-5,68%	40,76%	37,22%	-3,54%
Total						
Ratio overhead costs / primary costs	45,54%	41,35%	-4,19%	33,20%	29,39%	-3,80%
Ratio overhead costs / total costs	29,78%	27,86%	-1,92%	24,07%	21,88%	-2,20%

VZS			VWB			DLL		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
31,99%	32,26%	0,27%	35,43%	33,23%	-2,20%	20,50%	20,71%	0,21%
24,23%	24,39%	0,16%	26,16%	24,94%	-1,22%	17,01%	17,16%	0,15%
15,68%	14,67%	-1,00%	50,98%	58,81%	7,83%	1,22%	1,14%	-0,08%
13,55%	12,79%	-0,76%	33,77%	37,03%	3,27%	1,21%	1,13%	-0,08%
50,31%	52,44%	2,13%	38,95%	37,86%	-1,08%	57,00%	56,61%	-0,39%
33,47%	34,40%	0,93%	28,03%	27,46%	-0,56%	36,31%	36,15%	-0,16%
35,22%	36,04%	0,82%	37,75%	36,55%	-1,20%	28,70%	28,93%	0,23%
25,40%	25,65%	0,25%	26,24%	25,70%	-0,54%	21,34%	21,47%	0,13%

SAL			WZP			SFG		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
21,78%	19,34%	-2,44%	27,50%	11,50%	-16,00%	35,40%	34,83%	-0,57%
17,88%	16,20%	-1,68%	21,57%	10,32%	-11,26%	26,14%	25,83%	-0,31%
1,17%	1,74%	0,57%	10,64%	15,32%	4,68%	13,43%	12,59%	-0,84%
1,16%	1,71%	0,55%	9,61%	13,28%	3,67%	11,84%	11,18%	-0,66%
58,00%	36,32%	-21,67%	39,78%	45,60%	5,81%	55,84%	56,14%	0,30%
36,71%	26,65%	-10,06%	28,46%	31,32%	2,86%	35,83%	35,96%	0,12%
29,16%	22,04%	-7,12%	29,68%	22,30%	-7,38%	40,27%	40,00%	-0,28%
21,61%	17,38%	-4,23%	21,64%	17,42%	-4,22%	28,20%	28,07%	-0,13%

ZHH			IJZC			AZB		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
46,30%	45,37%	-0,93%	21,56%	20,31%	-1,25%	27,17%	24,93%	-2,24%
31,65%	31,21%	-0,44%	17,74%	16,88%	-0,86%	21,37%	19,96%	-1,41%
13,62%	13,37%	-0,25%	11,64%	12,05%	0,41%	5,95%	2,09%	-3,86%
11,99%	11,79%	-0,20%	10,43%	10,75%	0,33%	5,61%	3,83%	-1,79%
40,26%	36,96%	-3,30%	39,24%	36,06%	-3,17%	42,91%	32,14%	-10,77%
28,70%	26,99%	-1,72%	28,18%	26,51%	-1,67%	30,03%	24,32%	-5,70%
41,58%	39,82%	-1,76%	25,80%	24,55%	-1,25%	30,65%	25,39%	-5,26%
28,53%	27,64%	-0,89%	19,82%	19,07%	-0,75%	22,86%	19,70%	-3,17%

ASZ			OMZ			LZR		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
27,71%	24,30%	-3,41%	17,82%	18,17%	0,35%	31,15%	32,15%	1,00%
21,70%	19,55%	-2,15%	15,12%	15,37%	0,25%	23,75%	24,33%	0,58%
1,85%	2,29%	0,44%	27,10%	28,84%	1,74%	48,89%	41,83%	-7,05%
1,81%	2,24%	0,42%	21,32%	22,38%	1,06%	32,84%	29,50%	-3,34%
46,81%	38,89%	-7,92%	41,77%	37,74%	-4,03%	38,33%	40,47%	2,14%
31,88%	28,00%	-3,88%	29,46%	27,40%	-2,07%	27,71%	28,81%	1,10%
30,30%	25,96%	-4,34%	25,09%	24,79%	-0,31%	34,20%	35,26%	1,06%
22,51%	19,89%	-2,62%	19,71%	19,53%	-0,17%	24,89%	25,54%	0,65%

DTZ			ZLB			MZB		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
49,00%	47,09%	-1,91%	34,41%	34,90%	0,49%	33,04%	34,74%	1,69%
32,89%	32,02%	-0,87%	25,60%	25,87%	0,27%	24,84%	25,78%	0,94%
13,31%	13,59%	0,28%	9,99%	12,69%	2,70%	10,05%	1,59%	-8,46%
11,75%	11,97%	0,22%	9,08%	11,26%	2,18%	9,13%	1,56%	-7,57%
45,22%	52,00%	6,78%	60,67%	48,96%	-11,70%	57,30%	65,36%	8,06%
31,14%	34,21%	3,07%	37,76%	32,87%	-4,89%	36,43%	39,53%	3,10%
45,16%	46,76%	1,59%	39,65%	36,58%	-3,07%	37,86%	40,14%	2,29%
30,98%	31,10%	0,12%	26,51%	25,03%	-1,48%	26,91%	28,05%	1,13%

ZBO			SZH			HZR		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
51,33%	50,22%	-1,11%	46,82%	44,62%	-2,21%	22,24%	21,99%	-0,25%
33,92%	33,43%	-0,49%	31,89%	30,85%	-1,04%	18,19%	18,03%	-0,17%
12,28%	12,62%	0,34%	70,48%	32,10%	-38,38%	23,35%	22,01%	-1,34%
10,94%	11,20%	0,27%	41,34%	24,30%	-17,04%	18,93%	18,04%	-0,89%
34,25%	35,50%	1,25%	45,07%	49,53%	4,47%	39,91%	40,49%	0,58%
25,51%	26,20%	0,69%	31,07%	33,13%	2,06%	28,52%	28,82%	0,30%
42,13%	42,17%	0,04%	47,70%	44,53%	-3,17%	27,07%	27,20%	0,14%
28,80%	28,90%	0,10%	30,63%	29,22%	-1,42%	20,91%	20,93%	0,01%

WZA			GZZ			ALZ		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
39,53%	38,30%	-1,23%	50,24%	50,30%	0,06%	79,75%	84,20%	4,45%
28,33%	27,70%	-0,64%	33,44%	33,47%	0,03%	44,37%	45,71%	1,34%
18,64%	20,49%	1,85%	15,79%	1,10%	-14,68%	0,00%	0,00%	0,00%
15,71%	17,01%	1,30%	13,63%	1,09%	-12,54%	0,00%	0,00%	0,00%
42,93%	43,22%	0,29%	42,68%	41,93%	-0,75%	42,45%	49,52%	7,08%
30,03%	30,18%	0,14%	29,91%	29,54%	-0,37%	29,80%	33,12%	3,32%
38,58%	38,10%	-0,48%	44,48%	41,96%	-2,52%	59,45%	62,33%	2,87%
26,74%	26,57%	-0,16%	29,49%	28,17%	-1,32%	36,67%	37,40%	0,73%

OZG			RPZ			MCR		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
27,99%	28,27%	0,29%	41,21%	42,63%	1,42%	42,62%	45,25%	2,63%
21,87%	22,04%	0,17%	29,18%	29,89%	0,70%	29,88%	31,15%	1,27%
13,80%	12,90%	-0,91%	3,44%	3,53%	0,09%	32,34%	32,78%	0,44%
12,13%	11,42%	-0,70%	3,32%	3,41%	0,08%	24,44%	24,69%	0,25%
40,54%	58,87%	18,33%	46,99%	45,97%	-1,02%	44,82%	41,79%	-3,03%
28,85%	37,06%	8,21%	31,97%	31,49%	-0,47%	30,95%	29,47%	-1,48%
30,78%	36,74%	5,95%	38,38%	39,15%	0,77%	42,61%	45,24%	2,63%
22,74%	25,95%	3,20%	26,81%	27,21%	0,40%	29,04%	30,30%	1,26%

ZTA			MCM			RZG		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
30,36%	29,40%	-0,97%	43,76%	43,55%	-0,21%	34,68%	35,79%	1,11%
23,29%	22,72%	-0,57%	30,44%	30,34%	-0,10%	25,75%	26,36%	0,61%
4,92%	4,70%	-0,22%	11,96%	12,09%	0,13%	24,89%	26,78%	1,89%
4,69%	4,49%	-0,20%	10,68%	10,78%	0,10%	19,93%	21,12%	1,19%
73,74%	59,16%	-14,58%	71,20%	69,70%	-1,50%	63,77%	58,88%	-4,90%
42,44%	37,17%	-5,27%	41,59%	41,07%	-0,52%	38,94%	37,06%	-1,88%
39,18%	35,12%	-4,06%	46,74%	46,67%	-0,07%	38,97%	39,52%	0,55%
26,93%	25,13%	-1,79%	30,88%	30,98%	0,10%	27,36%	27,68%	0,32%

KGH			ZSE			ZVV		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
49,08%	48,27%	-0,81%	47,99%	48,42%	0,43%	19,85%	22,70%	2,85%
32,92%	32,56%	-0,36%	32,43%	32,62%	0,20%	16,56%	18,50%	1,94%
19,99%	15,31%	-4,68%	11,52%	10,92%	-0,61%	0,82%	1,04%	0,23%
16,66%	13,28%	-3,38%	10,33%	9,84%	-0,49%	0,81%	1,03%	0,22%
49,72%	44,41%	-5,31%	51,66%	52,08%	0,41%	48,88%	46,64%	-2,24%
33,21%	30,75%	-2,46%	34,06%	34,24%	0,18%	32,83%	31,81%	-1,03%
46,64%	43,71%	-2,94%	45,38%	45,49%	0,11%	25,55%	27,09%	1,54%
30,50%	28,90%	-1,59%	30,03%	30,29%	0,26%	22,04%	23,15%	1,11%

ZGV			SDU			TSZ		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
27,93%	31,24%	3,31%	31,07%	25,80%	-5,27%	30,14%	29,23%	-0,92%
21,83%	23,81%	1,97%	23,70%	20,51%	-3,20%	23,16%	22,62%	-0,55%
5,19%	5,62%	0,43%	8,49%	14,25%	5,76%	0,42%	0,19%	-0,23%
4,93%	5,32%	0,39%	3,69%	11,41%	7,72%	0,42%	0,19%	-0,23%
60,04%	58,98%	-1,06%	89,19%	73,19%	-16,00%	39,39%	36,58%	-2,81%
37,51%	37,10%	-0,42%	47,14%	42,26%	-4,88%	28,26%	26,78%	-1,47%
34,06%	36,02%	1,96%	42,87%	35,59%	-7,27%	30,03%	28,29%	-1,74%
25,40%	26,48%	1,07%	28,96%	25,34%	-3,62%	22,34%	21,29%	-1,05%

WGH		
2004	2005	Δ
25,32%	28,98%	3,66%
20,20%	22,47%	2,26%
16,90%	16,15%	-0,74%
14,45%	13,91%	-0,55%
44,84%	42,48%	-2,36%
30,96%	29,82%	-1,14%
28,88%	30,79%	1,91%
21,49%	22,76%	1,28%

GHZ		
2004	2005	Δ
24,22%	29,38%	5,17%
19,50%	22,71%	3,21%
31,45%	30,90%	-0,54%
23,92%	23,61%	-0,32%
83,60%	58,74%	-24,86%
45,53%	37,00%	-8,53%
40,38%	37,56%	-2,82%
28,33%	26,85%	-1,48%

DMM		
2004	2005	Δ
26,02%	29,67%	3,65%
20,65%	22,88%	2,23%
0,47%	1,70%	1,23%
0,46%	1,67%	1,21%
59,40%	59,27%	-0,13%
37,26%	37,21%	-0,05%
30,96%	33,40%	2,44%
22,82%	24,29%	1,47%

DHZ		
2004	2005	Δ
41,20%	42,42%	1,22%
29,18%	29,79%	0,61%
17,03%	25,61%	8,58%
14,55%	20,39%	5,84%
43,81%	54,15%	10,34%
30,46%	35,13%	4,66%
39,71%	44,46%	4,76%
27,41%	29,79%	2,38%

ZZV		
2004	2005	Δ
33,98%	30,91%	-3,07%
25,36%	23,61%	-1,75%
20,47%	23,35%	2,87%
16,99%	18,93%	1,93%
53,01%	53,18%	0,17%
34,65%	34,72%	0,07%
37,06%	35,31%	-1,76%
26,41%	25,50%	-0,90%

SZD		
2004	2005	Δ
29,68%	30,36%	0,67%
22,89%	23,29%	0,40%
9,90%	8,72%	-1,18%
9,01%	8,02%	-0,99%
27,73%	29,98%	2,25%
21,71%	23,06%	1,35%
27,16%	28,00%	0,84%
20,72%	21,33%	0,61%

EZH		
2004	2005	Δ
33,61%	30,45%	-3,16%
25,16%	23,34%	-1,81%
2,32%	1,51%	-0,81%
2,26%	1,49%	-0,78%
60,31%	58,67%	-1,64%
37,62%	36,98%	-0,64%
33,62%	30,46%	-3,16%
23,08%	21,73%	-1,35%

SAZ		
2004	2005	Δ
32,78%	33,26%	0,48%
24,69%	24,96%	0,27%
23,72%	13,19%	-10,53%
19,17%	11,65%	-7,52%
81,20%	70,38%	-10,82%
44,81%	41,31%	-3,50%
43,36%	39,83%	-3,53%
29,56%	27,90%	-1,66%

MSU		
2004	2005	Δ
58,59%	57,81%	-0,78%
36,94%	36,63%	-0,31%
14,65%	13,54%	-1,11%
12,78%	11,93%	-0,85%
57,37%	54,14%	-3,23%
36,46%	35,12%	-1,33%
53,52%	51,97%	-1,55%
33,81%	33,29%	-0,52%

STZ			ZBH			ZGN		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
25,47%	29,50%	4,02%	31,78%	29,38%	-2,40%	25,79%	26,30%	0,51%
20,30%	22,78%	2,47%	24,12%	22,71%	-1,41%	20,50%	20,82%	0,32%
42,79%	46,63%	3,84%	12,89%	11,76%	-1,12%	13,62%	13,37%	-0,25%
29,97%	31,80%	1,83%	11,42%	10,53%	-0,89%	11,99%	11,79%	-0,20%
44,96%	40,94%	-4,03%	57,11%	58,83%	1,72%	40,26%	36,96%	-3,30%
31,02%	29,05%	-1,97%	36,35%	37,04%	0,69%	28,70%	26,99%	-1,72%
32,83%	34,55%	1,72%	36,74%	35,51%	-1,23%	28,63%	28,00%	-0,63%
24,07%	25,16%	1,10%	26,25%	25,39%	-0,86%	21,62%	21,23%	-0,39%

IJZL			BZH			FZA		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
27,11%	21,35%	-5,76%	71,14%	77,17%	6,03%	44,52%	44,52%	0,00%
21,33%	17,59%	-3,74%	41,57%	43,56%	1,99%	30,80%	30,81%	0,00%
3,63%	4,88%	1,24%	14,97%	13,98%	-0,99%	12,60%	12,98%	0,38%
3,51%	4,65%	1,14%	13,02%	12,27%	-0,76%	11,19%	11,49%	0,30%
51,39%	49,59%	-1,79%	63,55%	53,29%	-10,26%	44,50%	44,01%	-0,49%
33,94%	33,15%	-0,79%	38,86%	34,76%	-4,09%	30,80%	30,56%	-0,24%
30,63%	27,02%	-3,61%	63,57%	62,90%	-0,67%	42,48%	42,35%	-0,13%
22,37%	20,41%	-1,96%	37,28%	37,00%	-0,27%	29,13%	29,06%	-0,07%

SJZ			ZRT			AZS		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
42,27%	43,50%	1,23%	44,71%	45,40%	0,69%	26,43%	23,99%	-2,44%
29,71%	30,31%	0,60%	30,90%	31,22%	0,33%	20,91%	19,35%	-1,56%
43,85%	36,23%	-7,62%	0,00%	0,00%	0,00%	11,37%	11,44%	0,07%
30,48%	26,60%	-3,89%	0,00%	0,00%	0,00%	10,21%	10,27%	0,06%
85,72%	63,37%	-22,35%	38,43%	43,91%	5,49%	36,95%	36,19%	-0,77%
46,16%	38,79%	-7,37%	27,76%	30,51%	2,75%	26,98%	26,57%	-0,41%
54,46%	48,13%	-6,33%	38,32%	40,82%	2,50%	28,25%	26,66%	-1,58%
22,59%	20,51%	-2,09%	26,72%	27,91%	1,20%	21,13%	20,25%	-0,88%

SCH			ZIR			ZNS		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
26,72%	27,68%	0,96%	26,75%	29,09%	2,33%	24,02%	23,09%	-0,93%
21,08%	21,68%	0,59%	21,11%	22,53%	1,43%	19,37%	18,76%	-0,61%
10,02%	19,57%	9,54%	0,86%	0,82%	-0,04%	2,21%	1,44%	-0,76%
9,11%	16,37%	7,25%	0,85%	99,19%	98,34%	2,16%	1,42%	-0,73%
59,99%	51,70%	-8,29%	56,97%	52,31%	-4,67%	27,66%	24,28%	-3,37%
37,50%	34,08%	-3,42%	36,29%	34,34%	-1,95%	21,67%	19,54%	-2,13%
34,17%	33,64%	-0,53%	32,10%	32,77%	0,67%	23,17%	21,19%	-1,98%
24,74%	24,40%	-0,34%	23,62%	24,03%	0,41%	18,12%	16,96%	-1,16%

ZWV			GDH			BIJZ		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
52,53%	51,10%	-1,43%	27,10%	27,18%	0,08%	25,52%	28,04%	2,53%
34,44%	33,82%	-0,62%	21,32%	21,37%	0,05%	20,33%	21,90%	1,57%
11,47%	14,89%	3,42%	17,48%	17,54%	0,06%	13,53%	11,83%	-1,71%
10,29%	12,96%	2,67%	14,88%	14,92%	0,05%	11,92%	10,58%	-1,34%
54,06%	47,42%	-6,64%	45,76%	45,33%	-0,43%	35,15%	46,68%	11,53%
35,09%	32,16%	-2,93%	31,39%	31,19%	-0,20%	26,01%	31,82%	5,81%
48,50%	45,90%	-2,60%	31,81%	32,25%	0,44%	26,87%	31,37%	4,50%
31,75%	30,57%	-1,18%	23,31%	23,75%	0,44%	20,18%	22,86%	2,68%

ZOA			SJG			HZW		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
53,65%	54,74%	1,09%	25,50%	24,11%	-1,40%	25,35%	27,57%	2,22%
34,92%	35,37%	0,46%	20,32%	19,42%	-0,90%	20,22%	21,61%	1,39%
1,35%	1,36%	0,01%	1,83%	2,82%	0,99%	26,08%	14,72%	-11,36%
1,33%	1,34%	0,01%	1,80%	2,74%	0,94%	20,69%	12,83%	-7,86%
54,25%	45,31%	-8,93%	67,26%	69,43%	2,17%	54,45%	44,67%	-9,78%
35,17%	31,18%	-3,99%	40,21%	40,98%	0,77%	35,25%	30,88%	-4,38%
48,13%	46,40%	-1,73%	32,03%	32,62%	0,58%	32,89%	30,79%	-2,10%
31,65%	30,95%	-0,70%	23,52%	23,89%	0,38%	24,33%	22,70%	-1,62%

ZTS			ZAA			RZS		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
59,36%	58,17%	-1,19%	33,23%	32,91%	-0,32%	46,29%	47,37%	1,08%
37,25%	36,78%	-0,47%	24,94%	24,76%	-0,18%	31,64%	32,15%	0,50%
18,21%	21,55%	3,33%	14,63%	8,59%	-6,04%	20,79%	21,22%	0,43%
15,41%	17,73%	2,32%	12,76%	7,91%	-4,85%	17,21%	17,50%	0,29%
144,16%	133,38%	-10,78%	45,10%	50,66%	5,56%	35,40%	34,69%	-0,71%
59,04%	57,15%	-1,89%	31,08%	33,63%	2,54%	26,15%	25,75%	-0,39%
72,47%	69,99%	-2,48%	35,70%	35,94%	0,24%	39,93%	40,27%	0,34%
38,70%	37,90%	-0,80%	25,39%	25,38%	-0,01%	27,79%	28,00%	0,22%

DZ			SLZ			SZA		
2004	2005	Δ	2004	2005	Δ	2004	2005	Δ
28,82%	21,17%	-7,66%	41,47%	41,02%	-0,46%			0,00%
22,37%	17,47%	-4,91%	29,32%	29,09%	-0,23%			0,00%
27,57%	21,49%	-6,08%	37,55%	24,89%	-12,66%			0,00%
11,01%	10,02%	-0,99%	27,30%	19,93%	-7,37%			0,00%
93,67%	101,60%	7,93%	71,09%	56,75%	-14,34%			0,00%
48,37%	50,40%	2,03%	41,55%	36,20%	-5,35%			0,00%
41,40%	39,57%	-1,83%	50,03%	44,87%	-5,17%			0,00%
28,35%	27,34%	-1,01%	32,47%	30,26%	-2,22%			0,00%

Average		
2004	2005	Δ
35,52%	35,21%	-0,31%
25,65%	25,39%	-0,25%
15,84%	14,66%	-1,18%
12,40%	13,27%	0,87%
53,71%	50,86%	-2,85%
34,18%	33,11%	-1,07%
38,06%	37,10%	-0,96%
26,21%	25,73%	-0,47%

Table A.6: Average result of the three kinds of hospitals and the total average

Table A.6: Average result of the three kinds of hospitals and the total average

Hospital	Average University medical centres			Average Top clinical hospitals		
Year / change	2004	2005	Δ	2004	2005	Δ
Personnel costs						
Ratio overhead costs / primary costs	39,6%	39,6%	0,0%	36,0%	35,8%	-0,2%
Ratio overhead costs / total costs	31,2%	31,2%	0,0%	26,0%	25,9%	-0,1%
Depreciation costs						
Ratio overhead costs / primary costs	34,3%	33,5%	-0,8%	13,5%	13,5%	0,0%
Ratio overhead costs / total costs	23,6%	23,0%	-0,6%	11,4%	11,2%	-0,2%
Other operating costs						
Ratio overhead costs / primary costs	54,3%	57,3%	3,1%	53,3%	49,5%	-3,8%
Ratio overhead costs / total costs	35,0%	36,2%	1,1%	33,9%	32,3%	-1,6%
Total						
Ratio overhead costs / primary costs	42,1%	43,1%	1,1%	38,2%	36,9%	-1,3%
Ratio overhead costs / total costs	30,9%	31,4%	0,5%	26,4%	25,8%	-0,6%
Hospital	Average General hospitals			Average total		
Year / change	2004	2005	Δ			
Personnel costs						
Ratio overhead costs / primary costs	35,5%	35,2%	-0,3%	35,9%	35,6%	-0,3%
Ratio overhead costs / total costs	25,6%	25,4%	-0,3%	25,9%	25,7%	-0,2%
Depreciation costs						
Ratio overhead costs / primary costs	15,8%	14,7%	-1,2%	16,8%	16,0%	-0,8%
Ratio overhead costs / total costs	12,4%	13,3%	0,9%	12,9%	13,5%	0,6%
Other operating costs						
Ratio overhead costs / primary costs	53,7%	50,9%	-2,9%	54,0%	51,1%	-2,9%
Ratio overhead costs / total costs	34,2%	33,1%	-1,1%	34,0%	32,9%	-1,1%
Total						
Ratio overhead costs / primary costs	38,1%	37,1%	-1,0%	38,5%	37,5%	-1,0%
Ratio overhead costs / total costs	26,2%	25,7%	-0,5%	26,4%	26,0%	-0,5%

Table A.7: Interview questions

Table A.7: Interview questions

General questions:

a. How many beds are available?

b. How many FTEs are used?

c. What was the total revenue in 2005?

d. How many organisation levels does the organisation has?

e. What is the structure of the organisation?

I Change in overhead

1. What do you mean by overhead?

2. Did the overhead costs of 2005 increase compared to 2004?

3. This increase in costs is that because of the implementation of the DBC system?

4. Are there other factors that caused the increase of overhead? (Like the electronic patient files, or corporate governance)

5. Are there overhead costs, which the organisation can not allocate?

6. Are there at the moment any plans to decrease the overhead costs (long or short term?)

7. Are there other reimbursements for academic, top clinical and general hospitals?

II Change in the ratio overhead / primary processes

8. Did you notice any changes in the ratio overhead / primary processes in comparison to the total amount of costs?

9. Did the primary costs increased (as well)? (for example the medicine costs)

10. Did the primary costs increased more then the overhead costs? What was the reason for this?

11. Does the NVZ has any influence of the cost structure of the organisation?

III The implementation of the DBC system

12. How was the implementation of the DBC system? And what was the preparation for this implementation?

13. Did the organisation had any problems by implementing the DBC system, what kind of problems where this?

III a Rational choice theory

14. Where there extra (overhead) costs because of these implementation problems?

15. Where there extra costs because of the implementation of the DBC system? How many extra costs?
16. In which year did you spent the most extra for the implementation of the DBC system?
17. Are this most of al incidental costs, or are these costs every year needed?
18. What do you expect of the amount of costs on long term?
19. Does the organisation calculate the cost prices of the products? Are there extra costs because of this process?
20. Are there clear goals set for the implementation of the DBC system, by whom?
21. Where the basic conditions satisfying, like having enough knowledge and funds? Could the implementation be better if the basic conditions where met better?

III b Social learning

22. Was it easy to implement the system throughout the whole organisation, with support of the different organisational levels?
23. Did the organisation created incentives, like training days, for the employees at the different organisational levels? Did this work well?
24. How is the feedback of the employees on the DBC system handled?
25. Is it possible as a organisation to change parts in the DBC system, or to give feedback to the central organisation, who runs the system?

III c Institutional theory

26. Is the implementation of the DBC system in line with other goals set by the organisation? And how is this for the sector?
27. Why did this change happen? What was the cause for the introduction of the DBC system? Are there reasons from within the organisation?
28. How did you know about the implementation of the DBC system? Did you receive information form within the hospital, or from other hospitals, or from the department?
29. During the DBC system implementation, did the organisation focussed more on the internal organisation, or did the organisation also had a close look at the other organisations within the sector?
30. Are the institutions within the organisation changed because of the implementation of the DBC system?

IV Complexity and service orientation

31. Is the DBC system more complex then the functional budget system? Are there more possibilities to choose from and is the level of difficulty higher?
32. Is the DBC system more focused on service compared to the functional budget system?

Table A.8: Selection qualitative research

Table A.8: Selection qualitative research

Number	Kind of hospital	Person interviewed	Function	Duration	Date interview
A1	Academic hospital	A1a	Manager Administratiekantoor	1 hour	23-3-2007
	Academic hospital	A1b	Hoofd Planning, Analyse en Control	0,5 hour	23-3-2007
A2	Academic hospital	A2a	Hoofd Concern AO/IC	1,5 hour	4-4-2007
T1	Top clinic hospital	T1a	Hoofd Planning & Control	1 hour	21-3-2007
T2	Top clinic hospital	T2a	Afdelingshoofd bedrijfsinformatie	1,5 hour	5-4-2007
G1	General hospital	G1a	Bedrijfseconomisch adviseur/ analist	1,5 hour	2-4-2007
G2	General hospital	G2a	Hoofd Administratie en Informatie	1 hour	26-3-2007

Table A.9: Table results interview

Table A.9: Table results interview

Table interview results							
Topic	Questions	1	2	3	4	5	6
general information	Name hospital	A1	A2	T1	T2	G1	G2
	Kind of hospital	Academic hospital	Academic hospital	Top clinical hospital	Top clinical hospital	General hospital	General hospital
	Place	Leiden	Amsterdam	Den Haag	Arnhem	Dirksland	Zoetermeer
general questions	Number of beds	882	1002	785	959	140	243
	Number of FTE's	5377	6133	2332	3550	422	641
	total revenue 2005	511785	565239	187514	278703	33454	50617
overhead costs	Costs for implementation DBC system	internal expenses	internal expenses (own application)	external expenses (bureau hiring)	internal/ external expenses	internal expenses (ICT)	internal expenses (extra hiring)
	There were extra overhead costs for implementation DBC system	-	-/+	-	-	-/+	+
	Other explanations for change costs	build extra properties	total cut down expenses	total cut down expenses	total cut down expenses	no	no
ratio overhead and primary processes	Overhead costs compared to the primary costs ratio increased	-	-/+	-	-/+	-/+	-
	Overhead costs compared to the primary costs because implementation DBC system where higher	-	-/+	-/+	-/+	-/+	-/+
Implementation of DBC system	There were no problems by implementing the DBC system	--	--	-	-	-/+	-
Rational choice theory	The goals for the DBC system were clear	-/+	-/+	++	++	+	+
	Basic conditions are met for implementation	++	+	++	++	++	++
	Implementation is top down, starting at the government	++	+	+	++	-/+	+
Social learning theory	Possible to implement changes to the system	(+) via medical administration	(+) via health care administration	(+) via health care administration	(+) via work group	(++) via help desk	(-/+) not really because small hospital
	How motivating employees to implement DBC system	pressure government	training days, task force	introduction responsibilities	pressure government	work groups, training days	pressure government, essential for reimbursement specialist in 2008
Institutional theory	DBC system in line with other goals	--	-	-/+	+	-/+	+
	Mimetic isomorphism	both	both	own organisation	both	own organisation	own organisation
Internal environment	Change in drive by financial priorities	not at all	A bit through the whole organisation by budgeting	only financial department	financial department yes, rest when a segment is not lump sum	specially financial department	financial department yes, rest when a segment is not lump sum
Complexity	Complexity of DBC system	+	+	+	+	+	+

For this table the following scale is used, where – is most negative statement and ++ is most positive statement, -/+ is a neutral statement