Financial incentives in health care

How provider payment systems influence the health care costs

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Abstract

For years, the costs of health care in The Netherlands have been high and rising, but still no durable solution for this problem has been found. This study constructed an overview of payment policies for hospitals and medical specialists in the Netherlands between 1995 and 2016. It compared these payment policies with country-level health care expenditure data to examine the relationship between financial incentives for cost containment in provider payment systems and health care costs, so that lessons could be drawn on what steps can be taken towards better health care provider payment systems. The study found that four big changes in the payment systems for hospitals and medical specialists have been introduced over the years. Those changes in payment policies went hand in hand with changes in the health care expenditures as a percentage of Gross Domestic Product (GDP), where health care expenditures as a percentage of GDP were lower when cost containment incentives were stronger, and vice versa. Caution is needed in interpreting these relationships because of data limitations, but these findings suggest that in any future payment system cost containment incentives should be aligned and that it is time to create rest in the health care payment systems.

Keywords: health care, costs, financial incentives, cost containment, provider payment systems, hospitals, medical specialists

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Introduction

The goal of the Dutch health care system is threefold, it aims for good quality, accessibility and affordability. Ideally, the Dutch government would like to realise the best possible health outcomes at the lowest possible cost (NZa, 2007). To achieve the goal of sustainable affordability, the Dutch government has tried to keep the health care costs from rising since the 1980s, but without much success, because since the implementation of a social health care system in the Netherlands, medical expenditures have kept on rising (Bakx, O'Donnell & van Doorslaer, 2016). To stop the costs from rising, the Dutch government has a number of different policy options. One option is the regulation of the standard care package (*basispakket*), which means changing which care is freely available to everyone. Another option is changing the amount that patients have to pay themselves by adjusting the mandatory deductible (*verplicht eigen risico)* or co-payment (*eigen bijdrage*). A third option is changing the payment system for hospitals and medical specialists to incentivise cost containment, which has been repeatedly done over the years (Helderman, 2016). Payment systems are defined as 'the system through which money is allocated to the provider of health care', analogue to Jegers, Kesteloot, de Graeve, and Gilles (2002). They are also called 'compensation' or 'remuneration' systems. Altering the behaviour of hospitals and medical specialists with payment systems to reach an affordable health care sector is not without risk, because all three of the goals of the Dutch health care system are important for a well working and sustainable health care sector. According to Chaix-Couturier, Durand-Zaleski, Jolly and Durieux (2000) quite some risks occur when financial incentives limit the treatment choices, for example limited continuity of care, underuse of emergency services resulting in delayed treatment and a reduced range of services offered to the patient. In this thesis, focus will be on the effect of a change in payment policy for hospitals and medical specialists on cost containment in the health care sector.

The goal of this thesis is to analyse to what extent financial incentives in the Dutch payment systems for hospitals and medical specialists were aligned in the years 1995-2016 and what effect these payment systems had on the health care costs, in order to produce lessons on what steps can be taken towards better health care provider payment systems. Therefore the payment systems and their incentives in the period 1995-2016 are analysed. We will see that the payment systems and incentives for hospitals and medical specialists diverged, which historically grew that way. We will also see that changes in the costs of the health care sector occurred simultaneously with changes in payment systems.

Payment systems in the Dutch health care sector have been analysed before, but the degree of alignment of these incentives and their influence on the health care costs remains unclear.

The main question I will attempt to answer in this thesis is: “How well did the financial incentives in payment systems for medical specialists and hospitals in the Netherlands align their interests to contain costs in the period 1995-2016 and what effect did this have on the costs in the health care sector?”.

To answer this question a theoretical framework of the health care market is established in chapter 1. The unique features of the health care market are described and their consequences on the relationships in that market are explained. In chapter 2 the payment systems for providers in health care are described. They are classified and the incentives of each system are explained. It is also explained in which cases payment systems align incentives and when not. In chapter 3 a description of the organization of the health care market in the Netherlands in the years 1995-2016 is given. In chapter 4 data from the Dutch health care sector are analysed. I looked at the trend in the health care costs and tried to draw connections to the policies active at that time. In chapter 5 the content of this thesis is summarized and a conclusion is formulated. The strengths and weaknesses of the research are discussed. Then, implications of the research for future provider payment policies are given. Lastly, suggestions for future research are given.

1. Theory

To understand why cost containment incentives in payment systems for hospitals and medical specialists would influence the costs of health care, this chapter introduces the health care market. The central question in this chapter is:

"Why do cost containment incentives in payment systems for hospitals and medical specialists influence the costs of health care?"

To answer this question the characteristics of the health care are discussed and the consequences for the relationships in the health care market are explored. This chapter ends with a description of the chosen framework for the analysis in this thesis.

1.1 The health care market

The healthcare market possesses a unique combination of features that makes it different from other markets. To find out how the health care market is different, the question that will be answered in this paragraph is:

"What are the specific characteristics of the health care market?"

1.1.1 Unique features

The health care market does not meet the requirements of a perfectly competitive market as proposed by Adam Smith in his influential book 'the Wealth of Nations' (1776), which are 1. A large numbers of players in the market, 2. No entry and exit barriers, 3. Marketability of all goods and services, 4. Symmetric information with zero search costs and 5. No increasing returns, externalities or collusion. While the health care market, or any other market, meets none of these requirements fully, the presence of insurance and existence of severe uncertainty and information asymmetry heavily impact the functioning of the health care market (Arrow, 1963; Pauly, 1978; Dranove & Sattertwaite, 2000).

Insurance

In the Dutch health care system, patients do not pay directly for health care: it is paid for via insurance. Access to health insurance can lead to excess health care demand from patients, when, under health insurance, the marginal costs of health care is zero. Cost is then almost always lower than marginal benefit, which creates an increased demand for health care (Schut & Varkevisser, 2014).

The market for health insurance differs from other insurance markets in multiple ways. First, there is great lack of information on health statuses so full marketability of insurance is

not possible, which means that the premium cannot perfectly reflect the risk (Dranove & Satterthwaite, 2000). This leads to either premiums that are too high, which means fewer people takin the insurance, or premiums that are too low, which leads to over insurance. Secondly, the insurance payment in this market does not depend on the loss, but on the expenditure made to repair the loss (Pauly, 1978). In, for example, a car-insurance market the insurance company usually pays out the net worth of the car on the day of a car accident. In the health insurance market the insurance company usually pays for the treatment that is necessary to get better. Because of this, the ideal health insurance would involve insurance against a failure to benefit from medical care (Arrow 1963), which could mean a pay out when there is no treatment that can make a patient better.

In short: the perfect insurance does not exist in the health care market and the existing insurance increases the patient demand for health care.

Uncertainty and information asymmetry

Another characteristic of the health care market is the existence of severe uncertainty. In the health care market, the relationship between process (health care) and outcome (health state) is far more uncertain than in other markets, for example like the relationship between car maintenance and the state of the car. According to Pauly (1978) there are two types of uncertainty in health care: irreducible and reducible uncertainty.

Irreducible uncertainty is the absence of information about the consequences of a treatment that is shared equally by doctor and patient. This could also be called imperfect information (Folland, Goodman & Stano, 2013). It means that physicians cannot be sure about the optimal treatment for a disease (Mot, 2002). When physicians and patients are risk-averse, the existence of irreducible uncertainty can lead to a higher use of a health technology than would be expected from the average effect of that technology (McClellan, 1995). A larger amount of irreducible uncertainty in the health care market will thus have a negative effect on the costs of health care.

Reducible uncertainty is the kind of uncertainty which represents information about quality which the seller has but the buyer does not. This could also be called information asymmetry. The amount of reducible uncertainty is greater in the health care market than in other markets, because medical knowledge, as to the possibilities and consequences of treatment, is highly specialist and mostly possessed by the physician, compared to the rather limited knowledge of the patient (Arrow, 1963). This makes it difficult to reduce this type of uncertainty because, as Arrow (1963) very nicely analysed: patients cannot value the information the physician gives them because if they could, they would be able to understand the information themselves. Paragraph 1.2 explains that this type of uncertainty causes the physician to be able to influence the patient demand for health care.

1.1.2 Conclusion

The question in this paragraph was: “What are the specific characteristics of the health care market?”. The presence of insurance increases the demand for health care. The existence of irreducible uncertainty causes physicians never to be certain about the optimal way to treat patients which can lead to a higher use of health care technology and higher costs. The existence of reducible uncertainty, which is equal to asymmetric information, means that physicians have much more and better information about the optimal treatment than the patients, which causes the physician to be able to influence the demand for health care.

1.2 Relationships between stakeholders

The previously described characteristics of the health care market shape the relationship between the players in that market. This paragraph explores the relationships in the health care market. The question in this paragraph is:

“How are the relationships between hospitals, medical specialists and patients shaped?”

To determine this I examined the influence of uncertainty and information asymmetry on the relationships in the health care market and on the market system.

1.2.1 Agency theory

The relationships between the players in the health care market can be analysed with agency theory. The standard theory of agency defines an agency relationship by the interaction between a relatively uninformed party (the principal) and an informed party (the agent), where the principal delegates decision making authority to the agent. In the health care market the medical specialist has a double agency role. On one side he is an agent for his patients; on the other he is an agent for the hospital. With regard to the patients, it is the medical specialist’s task to provide high quality care. With regard to the hospital, it is their task to economise on the use of care (Schut, 1995).

Medical specialist – patient

As explained in paragraph 1.1.1, the existence of reducible uncertainty causes there to be information asymmetry in the relationship between the medical specialist and the patient. The medical specialist has more information on the health state of the patient than the patient himself has. This makes the patient the principal and the medical specialist the agent. In this relationship, the patient buys a promise to “be fixed up” by the medical specialist (Harris, 1977). Patients largely follow the advice of their medical specialist, which puts the medical specialist in a position to influence the patient’s demand for health care (Phelps,

1997). A patient's demand for health care thus depends both on the patient's health state and on how the physician perceives and interprets that health state, so there is no independent demand for health care (Dranove & Satterthwaite, 2000). The perfect agent has been defined as "one who makes the same decisions that the patient would have made if the patient possessed the same information and expertise as the agent" (Labelle, Stoddart & Rice, 1994, page 355). If the physician thus is a perfect agent for his patient, the demand for health care is exactly that amount that the patient would choose if he had the information and knowledge that the physician has.

If the physician increases the demand by exploiting the information asymmetry between himself and his patient, we speak of physician-induced demand (PID, also called supplier-induced demand, SID). Donaldson and Gerard (1993) have defined SID as the amount of demand, induced by doctors, which exists beyond what would have occurred in a market in which consumers are fully informed. McGuire (2000) goes one step further by saying that PID exists when the physician influences a patient's demand for care against the physician's interpretation of what is best for the patient.

McGuire & Pauly (1991) have developed a model in which the amount of demand inducement is some trade-off between the utility of extra income for the physician and the disutility of that extra demand for the patient. In their model the utility of the physician is a function of income, leisure time and demand inducement. Income and leisure time have a positive effect on utility and demand inducement has a negative effect on utility. Further, income and leisure time have diminishing marginal utility and supplier induced demand has increasing marginal disutility. In this model physicians can induce demand for their services to raise their income and utility but they dislike doing so. A different payment system means a different reward per health care activity. Seen from a strictly economical perspective, when fees for medical services are higher than the cost, physicians will increase demand and vice versa.

According to Mot (2002), the amount of PID will be higher when there is more irreducible uncertainty. She argues that the ethics of physicians will keep them from doing harm to their patients, but that will not always keep them from performing health care services of which a positive outcome is uncertain and that do no harm to the patients. The trade of between income, leisure time and PID might thus have another outcome when irreducible uncertainty is higher.

It has been argued that the effect of payment systems on the amount of PID is not as big as theoretical models predict, because physicians do not only maximise their own utility, but look beyond their own interests. McGuire (2000) states that physicians will act in the best interest of the patient because they have professional autonomy. Rizzo and Zeckhauser (2003) argue that physicians may not fully exploit their potential of PID because the

physicians have ethics so they will (at least partly) act in the patient's best interest. They also argue that physicians stop inducing demand when they have reached a target income. Schut (1995) argues that a solution to the agency problem between the medical specialist and the patient would require the design of an optimal incentive structure to encourage providers to take adequate care of patient preferences.

Medical specialist – hospital

In the relationship between the hospital and medical specialist, the hospital is the principal and the medical specialist is, again, the agent. The medical specialist promises to try to properly treat patients, the hospital supplies the necessary inputs for that care delivery and tries to make a profit in doing so (Chandra, Cutler & Song, 2012).

Lakdawalla and Philipson (2006) have created a model in which the non-profit hospital is seen as utility-maximising, where utility is a function of quantity of hospital services and profit. The quantity of hospital services represents the altruistic motives of the hospital; the profit represents the selfish motives. For turning a profit, costs must be lower than revenues. In this model a part of the hospital's goals is thus containing costs. In the health care market, it is the medical specialist who decides on the quantity of care to deliver. This makes it very difficult for the hospital to contain costs if the medical specialists are not contributing to this goal. Also, because of information asymmetry the hospital has no way of knowing whether the allocation of resources that the medical specialist chooses is optimal for the hospital, so hospitals are hostages in their relationship with the medical specialist, also because they are judged on care delivery that they have no control over.

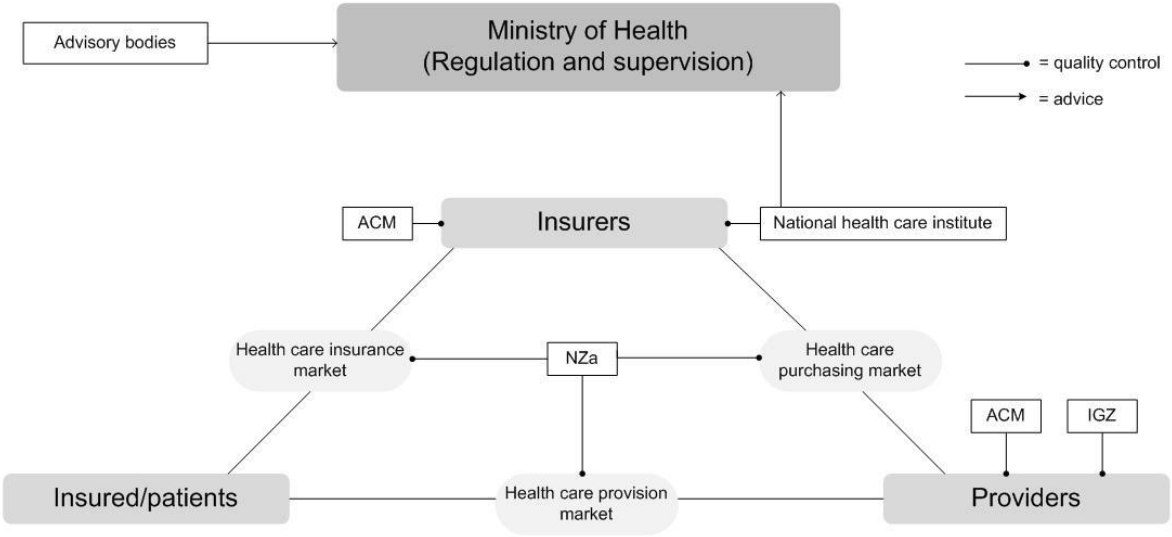
In the existing literature, it has been widely argued that the way of financing medical specialist care influences the use of specialist care because it influences the behaviour of the medical specialists (Hickson, Altmeier & Perrin, 1987; Davidson et al., 1992; Barnum, Kutzin & Saxenian, 1995; Kouides et al., 1998; McGuire, 2000; Gaynor, Rebitzer & Taylor, 2004). A change in the payment system for the medical specialist could thus be used to change the amount of care provided or to get the medical specialist to properly contribute to the hospital's goal of cost containment.

1.2.2 Market system

The health care system consists of complicated relationships between patients, medical specialists, hospitals and insurers that are all intertwined. In the Netherlands, the health care sector is regulated by the Dutch government and so are the relationships between the players in the health care market (see figure 1). In those relationships all players have their own individual interests, monetary and non-monetary goals to strive for. The principal-agent relationships that are caused by information asymmetry are not necessarily a cause for

trouble, but may cause problems when the principal and the agent have conflicting interests. Then the agent has an incentive to exploit his information surplus, resulting in inefficient outcomes for the principal. In order for the relationships to work optimally, the interests of the parties must be aligned (NZa, 2007). A possible way to align the interests is with (financial) incentives. Patients are not in the position to create powerful incentives for physicians, but the design of the market system design. If the market system is designed properly, the medical specialists should accordingly contribute to the hospital's (and society's) goal of cost containment.

Figure 1. The Dutch health care market



Source: Wammes, Jeurissen & Westert, 2014

1.2.3 Conclusion

The question in this paragraph was: "How are the relationships between hospitals, physicians and patients shaped?". We have seen that the medical specialist has a double agency role in the health care market. In their relationship with patients their task is to provide good care, in their relationship with the hospital, their task is to economise on the providing of care. The information asymmetry puts medical specialists in the position to in- or decrease the demand for care, so creation of aligned cost containment incentives could help containing the costs of health care. The Dutch health care market is regulated by the Dutch government, so the Dutch government is in the position to create a market system in which the physicians properly attribute to the goal of cost containment.

1.3 Theoretical framework

Based on the theoretical literature the following theoretical framework was chosen:
The health care market is a competitive market but deviates from a perfect market mostly on the points of insurance and the existence of reducible and irreducible uncertainty. Information asymmetry causes the medical specialist to have a double agency role with respect to their patients and the hospital. There is uncertainty about the optimal treatment and patients mostly follow the advice of the medical specialist. Patients can easily do so because they have insurance and thus do not bear the full costs of medical services. The medical specialist tries to optimise his utility, elements of which are income, leisure time and supplier-induced demand. Because of these circumstances the specialist is in the position to influence the demand for care and there is no independent demand curve. Because the elements of the physician's utility function are traded off against each other, doctors are not perfect agents for their patients. In this theoretical framework it is expected that payment systems influence the behaviour of physicians and thereby change the amount of care provided. The payment system in practice can thus support or hinder cost containment.

1.4 Conclusion

The central question in this chapter was: "Why do cost containment incentives in payment systems for hospitals and medical specialists influence the costs of health care?". To answer this question I first discussed the specific characteristics of the health care market. Then I discussed the special relationships between the patient and the medical specialist and the hospital and the medical specialist. I argued that the medical specialist is an agent and the other two parties are principals. I argued that these principal-agent relationships, coming from information asymmetry, put the medical specialist in the position to increase or decrease the demand for health care. I ended this chapter with a description of the chosen theoretical framework for the analysis in this thesis.

2. Payment systems

The principal-agent relationships between the hospitals and medical specialists create the need for aligned interests in cost containment. A possible way to align the interests is with financial incentives in the payment systems for hospitals and medical specialists. In this chapter I will discuss different possible payment systems. The central question is:

"What are the incentives for cost containment in the different payment systems and how well are these incentives aligned?"

I will discuss a typology to classify payment systems. I will also discuss five payment systems for providers and the incentives they contain. This chapter ends with an analysis of the alignment of incentives for cost containment in different payment systems.

2.1 Classification of payment systems

In this paragraph I will explain a typology of payment systems for hospitals and medical specialists. The question to be answered is:

"How can payment systems be classified?"

Many different classification systems have been developed over the years. I chose the typology by Jegers et al. (2002) to classify payment systems from an incentive point of view. Their typology exists of two dimensions; variable vs. fixed and retrospective vs. prospective (see figure 2). I chose this model because it considers both micro and macro level payment systems, which is relevant for the payment systems for the hospital and medical specialist.

2.1.1 Variable/fixed axis

The first dimension asks whether there is a link between production and pay.
In a fixed payment system the reimbursement does not change when activities increase or decrease. In a variable payment system a change in activity does induce a change in the amount of payment. The activities that are measured to determine the activity level vary. When expenses are higher than expected in variable reimbursement systems, it is the payer's responsibility to reimburse all of it, so the financial risk rests with the payers. More fixed reimbursement systems shift the financial risk away from payers to providers (Jegers et al., 2002). Fixed and variable systems can be distinguished on the level of the individual provider (micro level) and on the level of all providers as a group (macro level).

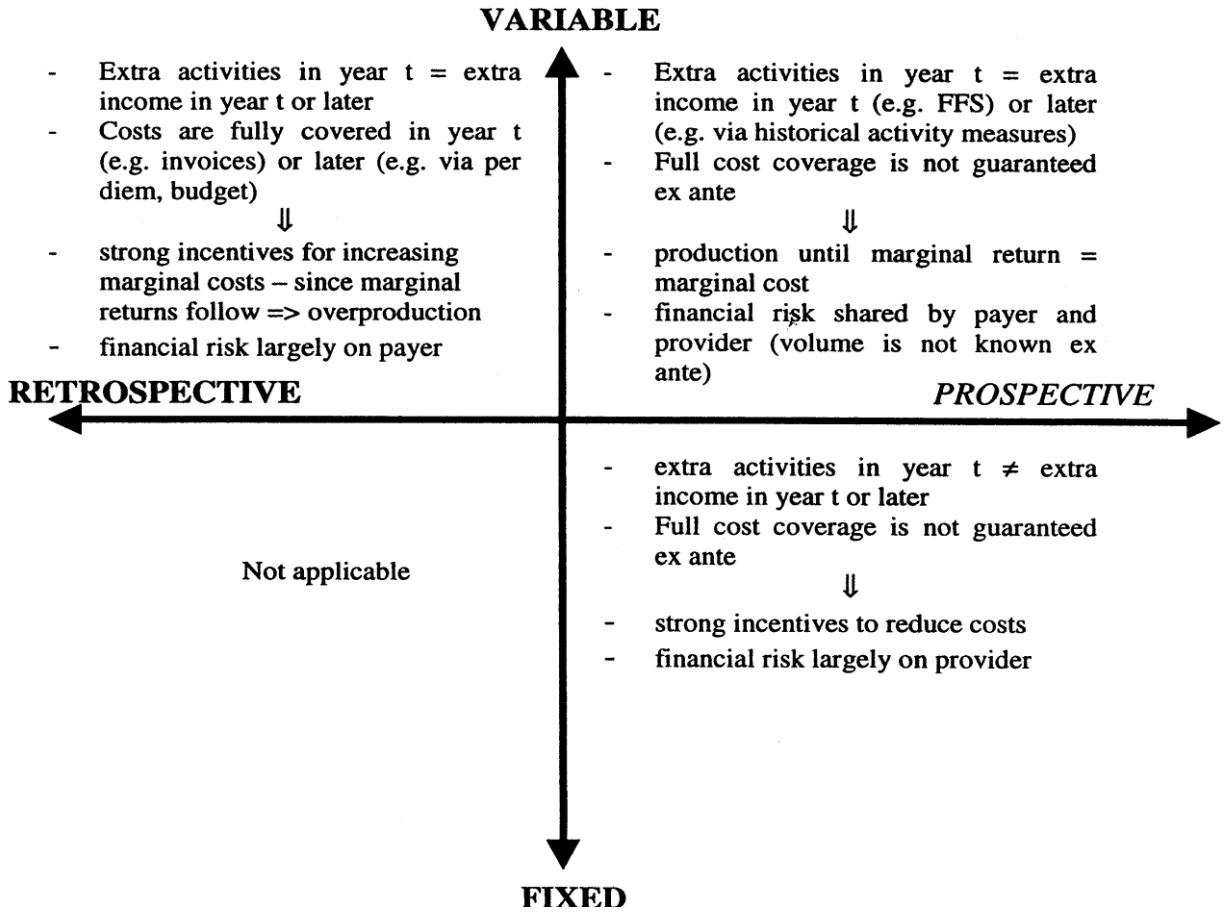
Micro level

At the micro level the behaviour of individual providers in response to financial incentives is examined. In variable micro level systems, providers receive reimbursement per activity. Their extra income is thus equal to the amount of reimbursement minus the cost of producing that extra activity. In fixed micro level systems total reimbursement is determined ex ante and thus by definition unrelated to production.

Macro level

At the macro level the behaviour of providers as a group is examined. A variable macro level system is called an open-end system. This is by definition also variable at the micro-level. A fixed macro level system is called a closed-end system. In closed-end systems the total budget is determined ex-ante but the system at the micro level can be fixed or variable.

Figure 2: Payment classification system



Source: Jegers et al., 2002

2.1.2 Retrospective/prospective axis

The second dimension asks whether there is a link between costs and pay.

Retrospective system

In a retrospective payment system, all costs are reimbursed ex post so there is a strong link between costs and pay. It should thus be a variable system on both the macro- and micro-level. A retrospective system should not be closed-ended, since expenditures cannot be forecast ex ante. The unit of reimbursement is irrelevant in retrospective systems.

Prospective system

In a prospective payment system, costs are forecast and paid ex ante, so there is no link between actual costs and pay. A prospective system can be variable or fixed (micro level) and open-end or closed-end (macro level). In open-end systems the monetary value of one unit is known ex ante, in a closed-end system this value depends on the total production of all providers.

Variable payment systems can be reimbursed prospectively or retrospectively. Fixed payment systems should only be reimbursed prospectively.

2.1.3 Incentives

In a variable payment system the level of activity depends largely on the value of the marginal income relative to the cost of production, because economic profit-maximization theory predicts that producers increase production until marginal revenues equal marginal costs (Jegers et al., 2002). In a fixed payment system the marginal benefits of production are zero, so there is little incentive to operate at a high activity level. In prospective payment systems an increase in costs does not lead to an increase in the amount of payment, so these types of systems are likely to encourage providers to reduce costs. In which way costs are reduced will depend on the unit of reimbursement (Jegers et al., 2002). In retrospective systems an increase in costs does lead to an increase in the amount of payment, so these systems contain no incentives to reduce costs.

2.1.4 Conclusion

The question in this paragraph was: “How can payment systems be classified?”. I used the typology by Jegers et al. (2002) to reason that payment systems can be distinguished on two axes; the variable/fixed axis and the retrospective/prospective axis. I explained that variable payment systems contain incentives for high production and fixed systems for low production and prospective systems contain incentives for cost containment and retrospective systems do not contain such incentives.

2.2 Theoretical & practical incentives of systems

Before we can look at the incentives for cost containment in the payment systems in the Dutch health care system, we should determine what the incentives in each payment system are. The central question in this paragraph is:

"What are the theoretical incentives for cost containment of the payment systems and are these incentives effective in practice?"

First, the characteristics of each payment system and the incentives in that payment system discussed. Then is examined whether an effect of these incentives has been found in practice. Strong statements about the actual effect of payment systems on the behaviour of medical specialists are hard to make because most empirical studies that have been done looked at differences between groups of providers that were paid differently, controlled for omitted variables and reversed causality. It is practically impossible to control for all omitted variables (Hasaart, 2011) and Dranove & Wehner (1994) have very nicely shown that the approach that used to be standard for investigating specialists' behaviour lead to the conclusion that obstetricians induce demand for childbirth, which is a case of reversed causality. Further, a lot of studies among physicians have been conducted, but most of them do not look specifically at medical specialists. So while many studies on the effect of payment systems on the behaviour of doctors have been conducted, most of them are not conclusive for methodological or data reasons.

2.2.1 Reimbursement systems in practice

Next follow the five funding schemes for hospitals and medical specialists as discussed by Christianson and Conrad (2012) in the Oxford Handbook of Health Economics. I will discuss where each payment system stands on both axes of the typology of Jegers et al. (2002) and will deduct what incentives the various payment systems thus contain in theory. I will also discuss some empirical studies done on the effect of one payment system versus another. Figure 3 provides an overview of the characteristics and incentives of each payment system.

Figure 3: Incentives in the payment systems

Reimbursement system	Fee-For-Service	Case-mix	Capitation	Salary	Budget
Degree of variability	more	←	→		less
Degree of bundling	less	←	→		more
Basis of payment	per action	per case	per enrollee	per period	per period
Timing of payment	pro/retrospective	prospective	prospective	prospective	prospective
Production	up	up/down	up/down	down	down
* Number of cases	up	up	up	down	down
* Number of services per case	up	down	down	down	down
Cost control	down	up/down	up	up	up

Source: adapted from OECD, 2016

Fee-for-service

The most variable and least bundled payment system is Fee-For-Service (FFS). With FFS each service is reimbursed separately so all production is rewarded. A FFS reimbursement system can be prospective or retrospective. When it is prospective, the monetary price of units is determined ex ante, so all prices are known in advance. When it is retrospective prices are determined ex post to fully cover all costs. FFS is thus located in the upper left or upper right quadrant in the figure by Jegers et al. (2002).

When marginal reimbursement for production is higher than marginal cost, FFS contains incentives for a high production, i.e. to increase both the number of cases treated and the number of services per case performed. This means it has two principal benefits: first, access of care is guaranteed and second, provision of the best care available is guaranteed (Jegers et al., 2002). Access of care should be guaranteed because FFS creates no selection issues. Provision of the best care available should be guaranteed because there are no cost control incentives to not give patients the best existing care. It can thus lead to a high quality of care and a quick uptake of innovation (Jegers et al., 2002; OECD, 2016). Those incentives may also lead to overtreatment, which is associated with higher costs, and there are no incentives to coordinate care, which can lead to a lower technical efficiency. Also, services that are not reimbursed through fees, like preventive care, receive little provider effort (Ellis & Miller, 2008). Fee-for-service thus does not contain incentives for cost containment.

Gosden et al. (2001) have done a review study on the effect of the reimbursement system on primary care physician behaviour. They found that FFS resulted in a higher quantity of primary care services provided compared with capitation but the impact on the quantity of secondary care services was mixed. FFS resulted in more patient visits, greater continuity of care, higher compliance with a recommended number of visits, but lower patient satisfaction regarding access to a physician compared with salary payment. Hickson et al. (1978) and Davidson et al. (1992) also found that physicians paid by FFS delivered more care than recommended. Van Dijk (2012) found that a change from capitation payment to a mixed payment system of capitation and FFS for General Practitioners (GP's) in the Netherlands increased the amount of care delivered. All of these empirical studies show that the incentives have the expected effect on the behaviour in practice.

Case-mix

Case-mix payment is less variable and more bundled than the fee-for-service system. In this system, health services are bundled and classified into a group according to medical costs, so it could also be called an itemised budget system. Providers are paid a fixed reimbursement per case, according to the type of case treated. The case-mix system is

usually prospective. Case-mix is thus usually located in the upper right quadrant of the figure by Jegers et al. (2002).

Because providers are paid per case, this system contains incentives to maximise the number of patients treated but to control costs within cases. There are little incentives to provide unnecessary services for patients. There are some incentives to select the most lucrative treatment, which is called upcoding (Ellis & Miller, 2008). The more detailed the system, the higher the incentives for upcoding are (Hasaart, 2011). This system also contains incentives to select the most profitable patients, which is called cream skimming (Silverman & Skinner, 2001; Friesner & Rosenman, 2009), and to increase efficiency, because efficiency reduces the totals costs of a treatment (OECD, 2016). It contains incentives to reduce costs by reducing quality, which is called quality skimping (Busse, Schreyögg & Smith, 2006). A case-mix payment system thus contains some incentives that encourage cost containment and some that discourage cost containment.

Upcoding has been found in practice; a hospital group in the Netherlands got fined €500.000 for upcoding policlinic groups to inpatient groups, which are more expensive (Keuzenkamp, 2012). Douven, Mocking and Mosca (2015) found that the number of services was, corrected for the demand, higher in areas where more physicians were paid by case-mix than a salary.

Capitation

The capitation payment system is less variable and more bundled than the case-mix system. Under capitation payment, providers receive a fixed payment per enrolee, where the specific rates can be adjusted for population characteristics. Capitation payment should thus be prospective. Capitation is located in the lower right quadrant in the figure by Jegers et al. (2002).

Capitation payment contains no incentive to increase the number of patients treated but it stimulates increasing the number of patients on the list and selecting the most profitable patients (cream skimming) (Ellis & Miller, 2008). The incentives for cream skimming can be reduced by adjusting the capitation payment to reflect the diversity in disease severity among enrolees (Robinson, 2001). Capitation payment stimulates reduction of services per patient, as long as this reduction does not lead to higher costs in the long run. In this system the provider bears the financial risk when actual costs exceed the fixed amount of reimbursement per case. Providers might constrain service use very aggressively, especially when there is no sharing of risks or surpluses, the contract is short-term in nature and if contract renewal does not depend on measures other than costs (Christianson & Conrad, 2012). Capitation can stimulate prevention, health promotion and coordination of care, which will increase efficiency, but this incentive is weakened when patients switch

providers frequently. Capitation can also stimulate quick referrals to other providers (OECD, 2016) and increase quality if higher quality leads to an increased number of patients on the list. It can decrease quality if a reduction of quality does not lead to higher costs in the long run. Capitation payment thus contains strong incentives for cost containment.

The reduction of services per patient has been found in practice; Davidson et al. (1992) found that physicians paid by capitation delivered less care than the guidelines recommended.

Salary

The least variable and most bundled payment system is the salary system. In this system a fixed amount of payment per time unit is received, regardless of the number of services performed. Individual providers are not responsible for covering costs with that salary. A salary is always prospective. Salaried payment is thus located in the lower right quadrant in the figure by Jegers et al. (2002).

Salaried payment contains no incentives to deliver unnecessary services, nor incentives for under provision, except for 'working less hard'. That last one is partly countered by the possible threat to lose one's job. There is no incentive to deliver high quality care, so payers typically rely heavily on enforcement of rules and procedures to enhance quality. This could be quality increasing or, when rule enforcement limits the provider professional ability to select the right treatment, quality decreasing (Christianson & Conrad, 2012). Salary payment thus contains no incentives that either encourage or discourage cost containment.

In practice it is found that a salary leads to a lower production of health care. Gosden, Pedersen & Torgerson (1999) did a systematic review of the literature to determine the influence of salaried payment on doctor behaviour. They suggest that payment by salaries is associated with the lowest use of tests, and referrals compared with FFS and capitation. Salary payment is also associated with a lower number of procedures per patient, lower throughput of patients per doctor, longer consultations, more preventive care and different patterns of consultation compared with FFS payment. Hickson et al. (1987) found that physicians paid with a salary provided less care than the guidelines recommended.

Budget

Budget payment is as invariable and bundled as salaried payment and it also means receiving a fixed amount of payment per time unit. A budget is always prospective. The difference is however, that with a budget providers are responsible for covering costs of treatment with the budget. A budget payment can resemble salaried payment, when the provider does not assume responsibility to provide care to a fixed number or a group of

individuals for a specified time period. Alternatively, it can resemble capitation payment when the number of individuals in a given period is fixed and the provider carries financial risk. Budgeted payment is thus located in the lower right quadrant in the figure by Jegers et al. (2002).

In both cases, payment is fixed, regardless of the number of services performed, so providers have an incentive to keep costs at low level. This means it contains incentives to have a low production by both a low number of cases and low production per case, to avoid high-cost patients, to make many referrals and to minimise the number and intensity of treatments provided (Ellis & Miller, 2008). Simultaneously, there is a risk of increased waiting times and possible shortages of care (OECD, 2016; Mot, 2002). With a fixed budget at the macro level, national budget impact is known in advance. Budgeted payment thus contains strong incentives for cost containment.

2.2.2 Mixed payment systems

In reality almost none of the payment systems used are 'pure form' payment system, they usually contain several features of different payment systems. These are called 'mixed' or 'blended' payment systems. Terms such as capitation payment or fee-for-service are used as a short-hand which resembles the essential core of the payment arrangement (Christianson & Conrad, 2012). Ellis & McGuire (1986) argued that mixed payment system of a fixed component per patient on the list and a variable component per treatment is favourable over both separate systems. The two types of reward in this payment system (variable and fixed) cover the two types of actions physicians should take. The variable component can cover the treatment costs (dependent on the quantity of care) and the fixed component can cover other actions, like creating quality and accessibility (Schut & Varkevisser, 2014). The reward per treatment should ideally be below the marginal cost. First, because then it does not give an incentive to over-treat. Second, as argued before, the existence of insurance in the market increases the demand for health care by patients, so a payment below actual costs will give the physicians an incentive to temper that patient demand (Schut & Varkevisser, 2014). The NZa (2007) argues that the perverse incentives that emerge in a system with only capitation are offset by the FFS component and vice versa. Robinson (1999) argues that a blended payment system can serve as a form of risk reduction because physicians with very sick patients would receive especially high fee-for-service payments. The OECD (2016) shows that in practice a broad trend in payment innovations is the use of pay-for-performance or value-based payments, which is the use of add-on payments on top of existing models that are tied to specific expectations of the care provider, for example coordination, enhanced quality or high performance.

2.2.3 Conclusion

The question central in this paragraph was: “What are the theoretical incentives of the payment systems and are these incentives effective in practice?”. This paragraph showed that fee-for-service and a salary contain no incentives for cost containment, case-mix contains both incentives that encourage and discourage cost containment. Capitation and a budget both contain incentives for cost containment. Looking at the tendency of the empirical research articles, it seems that incentives are effective in changing physician behaviour and can be used to reduce the use of health care resources. The use of financial incentives does not have only positive consequences; it also leads to limited access to certain types of care, lack of continuity of care and conflict of interests between the physician and the patient. Mixed payment systems could be used to reduce the negative consequences of financial incentives.

2.3 Alignment of incentives in payment systems

In the Netherlands there have been different payment systems for hospitals and medical specialists in use over the years, which grew this way historically. To determine how well the incentives in the Dutch payment systems are aligned, I will first examine how well the different payment systems align incentives. The question answered in this paragraph is:

“In which combination of payment systems are the incentives for cost containment well aligned and when are they not?”

Paragraph 2.1 explained that variable payment systems contain incentives for high production and fixed systems for low production and prospective systems contain incentives for cost containment and retrospective systems do not contain such incentives. Paragraph 2.2 explained the characteristics and thus the incentives of the payment systems. In this paragraph I will summarize the previous paragraphs, combine and compare them.

2.3.1 Payment systems

Fee-for-service is a variable payment system that can be reimbursed prospectively or retrospectively. This means that it theoretically contains incentives for a high production and encourages (prospective system) or discourages (retrospective system) cost containment, according to the model by Jegers et al. (2002). Fee-for-service leads to a high production in practice and does not contain incentives for cost containment, assuming that the reimbursement per treatment is higher than the costs.

The case-mix payment system is a variable and prospective system. This means it should contain incentives for a high production and encourage cost containment. The case-

mix system contains exactly those incentives in practice, because all patients are reimbursed but reimbursement per case is fixed.

Capitation payment is a variable, prospective payment system. It should thus contain incentives for a high production and cost containment. Capitation payment does exactly that in practice, by encouraging providers to increase the number of patients on the list and keeping costs per patient low.

Salary is a fixed payment system that is neither prospective nor retrospective, because costs do not have to be covered with the payment. Salary should thus contain incentives for a low production, which it does contain, albeit a weak incentive.

A budget is a fixed, prospective payment system. It should thus contain incentives for a low production and cost containment. A budget does indeed contain incentives for a low production and cost containment in practice, because all costs have to be directly covered with the budget.

2.3.2 Alignment of incentives

Because different payment systems for hospitals and medical specialists have been in use over the years, it is possible that the cost containment incentives in those systems are were not aligned at all times. One party could have been striving for cost control, while the other party was not striving for this at all, which is not efficient. An efficient payment system is therefore defined as: “a payment system that contains the same cost containment incentives for both the hospital and the medical specialist”. This does not have to mean that the cost containment incentives are very strong, it can also mean that cost containment incentives are weak or totally absent for both the hospital and the medical specialist.

Combining the capitation payment system with a budget creates an efficient system that contains the same incentives with regard to cost containment, namely to keep costs low. Using a capitation payment system combined with a budget for the hospital and medical specialist respectively or vice versa creates also an efficient system because creates no misalignment of incentives with regard to cost containment.

The case-mix payment system contains the same incentive for cost containment as capitation and a budget to keep costs per patient low, but it does not contain an incentive to keep total costs low. Using a case-mix system for the medical specialists with a budget or capitation system for the hospital creates an inefficient system because it misaligns the cost containment incentives, where the medical specialist might take more patients than the hospital can afford.

Salary payment contains no incentives for cost containment as does fee-for-service. Paying medical specialists with a salary and the hospital fee-for-service creates no misalignment of incentives with respect to cost containment and is thus an efficient system.

Combining either capitation or a budget for the medical specialist with case-mix or fee-for service for the hospital, creates an inefficient system because it creates a misalignment of incentives. However, this means having a system in which medical specialists focus on cost control and the hospitals have no interest in cost control. Since the medical specialist is ultimately the one who decides on the amount of care to provide, costs will likely be contained, even though the hospital is not contributing to this goal.

Combining case-mix or fee-for-service for the medical specialist with capitation or a budget for the hospital creates the same misalignment of incentives (so an inefficient system) and in this case it can create problems. In this case the hospital is focussed on cost control but the medical specialists are not, so they can cause a problem for the hospital by treating too much.

Summarising, incentives for cost containment are not always aligned across the different payment systems for hospitals and medical specialists, which is mainly a cause for cost containment problems when providers at the macro level have incentives to contain costs and providers at the micro level do not.

2.3.3 Conclusion

The question in this paragraph was: “In which combination of payment systems are the incentives for cost containment well aligned and when are they not?”. The incentives for cost containment are aligned when both the medical specialist and the hospital have to focus on controlling costs or both do not focus on it.

2.4 Conclusion

The central question in this chapter was: “How well are the incentives for cost containment in the different payment systems aligned?". To answer this question I first explained the typology by Jegers et al. (2002) and used it to show that variable payment systems contain incentives for high production and fixed systems for low production and that prospective systems contain incentives for cost containment and retrospective systems do not contain such incentives. Then I showed that fee-for-service and a salary contain no incentives for cost containment, case-mix contains both incentives that encourage and discourage cost containment. Capitation and a budget both contain incentives for cost containment and that the incentives seem effective in practice, but that they do not only have positive consequences. Then I combined the model by Jegers et al. (2002) with the expected incentives and showed that these two are in line. I ended with a summary of the alignment of incentives for cost containment in the different possible payment systems. In the next chapter we will see how well those incentives are aligned in practice.

3. Empirical: Systems in practice

This chapter describes the organisation of the Dutch health care system in the years 1995 to 2016, to find out how well the incentives for cost containment for hospitals and medical specialists were aligned. The central question in this chapter is:

"How were Dutch hospitals and medical specialist financed between 1995 and 2016 and what were the financial incentives for cost containment in those financing systems?"

Throughout the years, quite a number of different compensation systems for hospital and medical specialist costs have been used in the Netherlands. First I will describe the systems that were used from 1995 until 2014. Then I will describe the system currently in use. After the description of each system I will discuss the incentives for cost containment in it.

3.1 Previous systems

This paragraph is about the former systems for financing hospitals and medical specialists in the Netherlands. The question that will be answered is:

"How were Dutch hospitals and medical specialists financed between 1995 and 2014, what were the financial incentives for cost containment in these payment systems and were the incentives aligned?"

The different payment systems in use can be broadly characterised as salary (S), budget (B), case-mix (CM) or fee-for-service (FFS). Figure 4 provides an overview of the payment systems for hospitals and self-employed medical specialists.

Figure 4. Payment systems through the years

Years	Before 1995	1995 - 2000	2001 - 2004	2005 - 2007	2008 - 2011	2012 - 2016
Hospital	B	B	FFS			
A segment				B	B	B
B segment				CM	CM	B
Self-employed medical specialist	FFS	B	B			
A segment				B	CM	B
B segment				CM	CM	B
Salaried medical specialist	S	S	S	S	S	S

S: Salary, B: budget, CM: case-mix, FFS: fee-for-service

Created by the author, based on Wubulihasimu, Brouwer and van Baal (2016)

3.1.1 Before 1995: functional budgeting & FFS

Before 1995, for hospitals the payment system was a functional budgeting model (*functiegerichte budgettering, FB*). Hospitals and health insurers determined the hospital

budget together, based on 3 budget components: an availability component, a capacity component and a production component. Hospitals invoiced all given care to the health insurers, but this did not influence hospital revenues because the ex-ante set budget was always exactly paid to hospitals. If the hospitals did not meet the budget with the claims, the difference was paid nevertheless, if they exceeded the budget, the difference had to be repaid to the health insurer. Differences in actual output did not influence the current budget, but could influence the negotiations for next year's budget.

For medical specialists there were two payment systems in use. Most specialists in academic hospitals (and some in other hospitals) were, and still are, salaried. Their payment system and the corresponding incentives do not change much over the years and these salary costs are included in the hospital budget, so in the rest of this paragraph I will focus on self-employed medical specialists. The payment system for self-employed specialist was largely fee-for-service (Hasaart, 2011). Every medical specialist negotiated the height of their fee with the health insurers (Schut & Van de Ven, 2005). The total revenues of self-employed medical specialists were capped under an annual macro budget, set by the Five Party Agreement between the medical specialists (LSV), hospitals (NVZ) and health insurers (VNZ, KLOZ, KPZ) in 1989 (Schut, 1995). If the total budget was exceeded, for example due to increased production, the fees of all medical specialists were reduced proportionally. This gave individual medical specialists an incentive to actually produce more in a given year to compensate a potential fee reduction (Schut & Varkevisser, 2013). In practice the expenses for medical specialist care exceeded the budget each year, which subsequently led to sharp fee reductions (Schut & Van de Ven, 2005).

Even though both the budget for hospitals was fixed and the total expenses for the self-employed medical specialists were capped, the incentives for hospitals and self-employed medical specialists differed. The individual hospital immediately faced payment cuts after a budget overrun so they had a clear cost containment incentive. The individual medical specialist however had no direct cost containment incentives under the FFS payment system and even faced incentives to increase production to counter a possible fee cut. Therefore, the cost-containment incentives were not aligned.

3.1.2 1995-2005: FB & Lump sum budget

In 1995, the Dutch government started an experiment to change the financing system for self-employed medical specialists from fee-for-service to a lump sum payment system. This would eliminate the direct link between the number of treatments the medical specialists performed and their income. Under the new lump sum budget, every hospital received a fixed total lump sum for the medical specialists, which was based on historical data and had

to be divided between the specialties. When the division was based on past production levels it guaranteed each specialist his historical income (Folmer & Westerhout, 2002).

With this new lump sum budget, the production incentives for self-employed medical specialists were largely removed. Because the functional budget was still in place for the hospitals, this led to relatively well aligned incentives. Now, neither the hospitals, nor the medical specialists had an incentive for a high production. So while the incentives for all medical specialists (self-employed and salaried) and hospitals were well aligned, the absence of production incentives resulted in a new problem: the generation of waiting lists (Hasaart, 2011).

3.1.3 2001: Cash-on-the-nail

To combat the problem of growing waiting lists, the 'cash-on-the-nail' (*boter-bij-de-vis*) principle was introduced in 2001. From then on the hospital budgets were adjusted when the amount of care delivered was less or more than previously agreed (Heezen, 2005). Wubulihasimu, Brouwer and van Baal (2016) characterized this payment system as FFS, because the budget became variable when the maximum was reached. This created a misalignment of cost containment incentives for the hospitals and the medical specialists. The medical specialists were still paid with the lump sum and had cost containment incentives; the hospitals now did not have cost containment incentives anymore. However, this payment model did not punish poor performance enough to counter the long waiting lists (Hasaart, 2011; Vijsel, Engelfriet & Westert, 2011). Eventually, policymakers realised it was necessary to make the health care sector more demand-driven. The idea was that the role of the government would change from active regulation to setting and guarding the rules of the game of market competition (Algemene Rekenkamer, 2011).

3.1.4 2005: Introduction of the DTC system

In 2005, the Diagnosis-Treatment-Combination (DTC) system was introduced to prepare the health care market for a regulated market system. A DTC covered the complete process of care, by naming all activities during the patient's treatment, from the first contact until completion of treatment. Because of the high number diseases and treatments, the initial number of DTC's added up to more than 30.000. The introduction of the DTC system meant a switch from the budget model to a case mix-tariff for the entire treatment of a patient, for both the hospitals and the specialists (Hasaart, 2011). The DTC system supported the market system because it created clear products and introduced a positive link between performance and revenues. Under this system, each DTC contained a separate fee for the hospital expenditures and the medical specialist fees. The DTC's were, and still are, divided into two segments: the A- and B-segment.

A-segment

The type of care in the A-segment is mostly acute care (Ruwaard, Douven, Struijs & Polder, 2014). DTC's in the A-segment were financed through the already existing functional budget. The NZa set the prices of the DTC's so price competition was absent and hospitals could not spend beyond their budget ceiling. The functional budget was leading in this segment and the DTC's were only used for administrative purposes (NZa, 2013; Hasaart, 2011). The medical specialists were still paid a lump sum for DTC's in the A-segment. In 2005 90% of all hospital care was assigned to the A-segment and this was gradually decreased to only 30% in 2012.

B-segment

The type of care in the B-segment is mostly plannable care (Ruwaard et al., 2014). Prices of DTC's were, and are, bilaterally negotiated between health insurers and providers. Hospitals must cover all costs with this price and thus incur a financial risk for care products in the B-segment. There is some variation in the DTC prices in the B-segment because insurers with a larger market share are able to negotiate lower prices and insurers with a small market share have to accept higher prices (NZa, 2007). The B-segment has an open-ended funding regime, where the revenues of each hospital are the product of DBC-volume and -prices (Hasaart, 2011). For the medical specialists, who were also paid with the case-mix DBC system for care in the B-segment, the amount of DBC's for care in the B-segment was estimated. That amount was withdrawn from the lump-sum the specialists received. When a medical specialist would produce exactly the amount of estimated DBC's, the income would remain the same. Producing more or less than the expected amount of DBC's thus in- or decreased the income (Groeneveld, 2006).

For both the care in the A- and B-segment the incentives for cost containment for hospitals and medical specialists were aligned. In the A-segment both the medical specialist and the hospital were paid with a budget, which contains strong cost-containment incentives. In the B-segment, both were now rewarded with a case-mix system, which contains incentives to control cost on a micro level (individual, per case) but also to expand costs on a macro level (number of cases), so the incentives for cost containment were also aligned**.**

3.1.5 2008: Performance-based payment

In 2008, performance-based payment (*prestatiebekostiging*) was introduced for the self-employed medical specialists (NZa, 2008). This meant that the lump sum system for care in the A-segment was abolished and since then the income of the self-employed medical specialist is determined by the revenues of DTC's only (a case-mix payment system) (Vektis, 2009). The medical specialists directly received the fee component of each DTC claim from

the insurer. The levels of the medical specialist fees were regulated by the Dutch Healthcare authority (*Nederlandse Zorgautoriteit, NZa*) to avoid a big increase in fees created by the market power of specialists (NZa, 2012). The fee was a multiplication of a fixed fee per hour and a norm time per specific DTC (Hasaart, 2011).

Where the incentives for cost containment were aligned for both the care in the A- and B-segment in the years 2005-2007, this changed with the introduction of performance-based payment for medical specialists in 2008. From then on, hospitals were still paid with a budget for the care in the A-segment while the medical specialists were paid with a case-mix system for care in the A-segment. Hospitals thus had incentives for cost control while the medical specialists had incentives that both encouraged cost control by reducing the costs within cases and incentives that discouraged cost control by increasing the number of cases. The incentives for cost containment were thus misaligned for care in the A-segment. Both the hospitals and the medical specialists were still paid case-mix for care in the B-segment, so the incentives for cost control were still aligned in the B-segment.

3.1.6 2012-2014: DOT & agreements

In 2012 things changed again. First, for hospitals the case-mix payment was also introduced for care in the A-segment. This meant the end of the functional budget and the start of case-mix payment for all hospital care. The prices in the A-segment are still regulated by the NZa, who sets a maximum tariff per DTC based on cost information. Products in the current A-segment are complex care products (i.e. trauma care, donor teams, helicopter services) for which free pricing is considered to be unfeasible or undesirable. The payment for care in the B-segment remained the same.

A precondition for a successful implementation of performance-based payment was the introduction of a simpler DTC system because the old DTC system was too complex. It had more than 30.000 DTC’s, which made negotiations between hospitals and insurers complex and time consuming, so the DOT (**D**TC's **O**n their way to **T**ransparency) system was introduced (NZa, 2011). Under DOT the number of DTC's was reduced from 30.000 to 4.400. The new DTC's are specialism transcending, so medically better recognizable and the burden of care is better reflected (NZa, 2011). DOTs are not prospectively administered by medical specialists, but the provided care is entered into an application, which deducts the DOT that has been delivered. Hospitals then send an invoice to the insurer.

Furthermore, for the years 2012-2015 a voluntary agreement *(het bestuurlijk hoofdlijnen akkoord)* was formed between 5 parties: the government (VWS), the hospitals (NVZ, NFU, ZKN) and the health insurers (ZN). In this agreement the parties confirmed to aim for a structural cost growth of a maximum of 2.5% per year (Rijksoverheid, 2011a). In this period growth above contract was not to be reimbursed. If the parties would not be

successful in keeping the growth of costs under 2.5%, the Minister retained a macro control instrument (*macrobeheersingsinstrument, MBI*) to make each caregiver refund a share of the exceedance based on their share of the total costs (NZa, 2015a). The MBI is a last resort if the national budget (BKZ), further explained in paragraph 3.1.7, is exceeded and it guarantees that hospitals can be cut in their compensations if costs of hospital care have exceeded the macro budget (Hasaart, 2011).

Also, for the years 2012-2014, for the medical specialists a control model for the fees was in place *(beheersmodel honoraria medisch specialistische zorg)*, which created an expenditure limit for the medical specialist fees per hospital. The NZa calculated the limit per hospital, based on the national macro budget and data on the fees in the years 2007, 2008 and 2009. The total of all individual fee ceilings added up to the national budget (BKZ) for medical specialists. If the expenditures exceed the ceiling, the exceedance had to be paid back to the government.

In the years 2012-2014 the medical specialist fees and hospital expenditures were thus separately regulated, the former with the described control model for medical specialist fees, the latter with the (BKZ). The medical specialist fees and the hospital expenditures had a separate cap and there could be no substitution between the two frameworks.

Ruwaard et al. (2014) analysed the contracts between health insurers and hospitals in 2012. They found that in these contracts three payment methods were used: 1. Ex-ante set budget that had no relationship with the provided amount of care, 2. Case-mix payment based on the provided amount of care, with a maximum cap and 3. Case-mix payment based on the provided amount of care, without a cap. The last system was only used a few times. The contracts were incomplete, as that insurers had the option to adjust prices during the contract. Prices could thus be adjusted when the level of care did not meet the ex-ante set budget or when it exceeded the budget or cap (Ruwaard et al., 2014). With the ex-ante set budget, it could be seen at the end of the year whether the budget had been appropriate, which was taken into account for the following year's negotiations (NZa, 2015c). With the capped case-mix system, it depended on the agreement what happened when the cap was reached. In all cases, the average income per DBC decreased, which caused the real income per DBC to be different from the ex-ante agreed price (NZa, 2015c). So even though the basis of the payment for hospital care was a case-mix system, the incentives for hospitals were not exactly equal to the incentives expected in a case-mix system. The payment specified in the contracts between insurers and hospitals caused most hospitals to be paid either with a budget or a capped case-mix system. Because prices could be adjusted later to make the level of care meet the budget, it was in the hospital's best interest to keep effort and thus the amount of care and costs low, because then prices would be highest. Further, the existence of the BKZ and MBI created an extra cost containment incentive for

hospitals, because it was possible that cost overruns would have to be paid back. The hospitals thus had clear cost containment incentives. The medical specialists were paid the fee component of each provided DOT, where the total fees were capped at the level of the individual hospital. The incentives for the medical specialists were thus to attract many patients and to keep costs per patient low. When costs came near reaching the cap, an extra incentive was felt for keeping overall costs low. The incentives for cost containment for hospitals and medical specialists were thus largely aligned, but the hospital had slightly stronger cost containment incentives.

3.1.7 Cost containment - BKZ

The Dutch government has consistently been striving for cost control in the health care sector since the beginning of the 1990. To support this, the Budgetary Framework for Care (*Budgettair Kader Zorg, BKZ*) was introduced in 1994. Since then the government parties that form a cabinet decide on total funds to be made available for health care in the subsequent four years and the total available funds should not be adjusted during those four years (Algemene Rekenkamer, 2011). The total costs of the collectively financed health care expenditures have to stay within the boundaries of this financial framework. So even though some payment systems do not encourage cost containment, the total amount to be spent on health care has always been capped at the macro level. In practice the total costs per year often exceeds the budget. These cost overruns have to be compensated, preferably by tariff or budget adjustments in the following year (Schut & Varkevisser, 2014). Looking at the past years, cuts in tariffs have – under different names and calculation methods – mostly been applied to hospitals (Algemene Rekenkamer, 2011). For example, in 1998 the budget was exceeded and to address this, the budgets were cut in 2000. In 2003 there was an efficiency discount to counter the strong growth of expenditures. In 2006 the production was still growing and to counter this there was a macro discount in 2007. There also was a structural discount in 2007 to counter imminent budget overruns in that year. In 2008 there was again an efficiency discount and in 2011 there were again macro discounts to compensate the cost overruns. The only difference between the macro and efficiency discounts is the way they are calculated (Algemene Rekenkamer, 2011). A problem with keeping the costs within the set budget is that patients have a statutory right to health care, also when the budget has been fully spent. In a non-market system, the government could interfere with prices, volume and capacity to adjust the input and output. However, because of the market system the government cannot directly interfere because this system the government only sets the rules for competition, which creates a tension between the budget ceiling and the character of the market system (Algemene Rekenkamer, 2011).

3.1.8 Conclusion

Even though the health care system underwent many changes over the years 1995-2014, the payment systems for hospitals and medical specialists can broadly be characterized as either budget, case-mix, fee-for-service or salary. The medical specialists that work directly for the hospital are paid a salary, and this never changed during this period. The payment system for hospitals can be characterized as a budget from before 1995 to 2000 and as fee-for-service between 2001 and 2004. After 2004 the payment system became a budget for care in the A-segment and a case-mix system for care in the B-segment. Since 2012 the hospitals have either a budget or capped case-mix contract with the health insurer and the BKZ created an extra cost containment incentive. The payment system for self-employed medical specialists went from fee-for-service before 1995, to a budget between 1995 and 2004. It remained a budget for care in the A-segment in 2005 and became a case-mix system for care in the B-segment. In 2008 the introduction of performance-based payment created a case-mix system for both care in the A- and B-segment and the introduction of the fee control model created an extra cost containment incentive.

3.2 Current system

In this paragraph I will explore the current payment system for hospitals and self-employed medical specialists. The question that will be answered in this paragraph is:

"How are hospitals and medical specialists financed from 2015 on, what are the financial incentives for cost containment in these payment systems and are they aligned?"

In the current system, health care financing for self-employed medical specialists is a three-step process (NZa, 2015a). Salaried medical specialists are still financed the same way as before, which is directly with a salary.

3.2.1 2015: Integral funding

The current Dutch health care system of integral funding (*integrale bekostiging)* was put into functioning on January first, 2015 (NZa, 2015a). The existing BKZ and the control model for the fees of the medical specialists were replaced with a new integral control model (*integraal macrobeheersmodel*). The total amount of reimbursement for collectively financed hospital care is now capped at the macro level. In this new model, if total revenues exceed the maximum, the payment for health care providers is still cut with the percentage of their part of the total revenues (NZa, 2015d).

First step: negotiations between insurer and hospital

In the first step, as before, hospitals negotiate with health insurers about the care in the B-segment to make deals on prices, quantities and quality of care. Insurers are obliged to buy enough care for their patients, but they are not obliged to contract every hospital. There is no deadline for the contracts, so insurers can contract a new hospital at any time (NZa, 2015b). Hospitals claim the care delivered via DOT's at the insurers. Since 2015, the compensation for the hospital costs and the medical specialist fees are not separated on the bill anymore, and hospitals are free to allocate the overall fees between hospital costs and medical specialist fees.

Second step: negotiations between hospital and MSB

In the second step the hospitals negotiate with the so called medical-specialist-companies (*medisch specialistisch bedrijf, MSB*). These MSB's are separate companies, in which a number of self-employed medical specialists are united. Hospitals can now negotiate with the MSB's about quality of care and registration responsibility and this also opened up the option for hospitals to agree on remuneration for the MSB with a fixed and variable component, where the variable component could be linked to performance (NZa, 2015a). The revenues of the MSB are determined together by the hospital and the MSB. Since the change in 2015, hospitals and self-employed medical specialists have two options in choosing an organizational model: 1. the cooperation model or 2. the participation model (PWC, 2014; NZa, 2015a; NVZ, 2013). Crucial in the cooperation model is that the MSB is a firm on its own. The MSB must have a board that starts a collaboration with the hospital, which can contain agreements on strategy, mutual services and their prices, quality and safety, accountability and liability (PWC, 2014). Even though the model is currently in use, the minister of health (*Volksgezondheid, Welzijn en Sport, VWS*) emphasized that this is a temporary model, because the incentives for the MSB and hospital can be conflicting in this model (Rijksoverheid, 2016). In the participation model, the medical specialists are still united in an MSB, but at the same time they are shareholders of the hospital (PWC, 2014; NVZ, 2013). In this model, both the hospital and the medical specialist thus have an interest in a financially healthy hospital. In July 2016 no hospitals in the Netherlands were using the participation model yet (Rijksoverheid, 2016).

Third step: negotiations between MSB and medical specialist

In the third step, medical specialists make arrangements with their MSB about the division of payments between the different specialties. The MSB-board decides on the way the revenues are divided between the medical specialists.

3.2.2 Incentives

As in the system from 2012 to 2014, hospitals can now still be rewarded with either a budget or a case-mix system with variable prices, dependent on the contract type between the hospital and the insurer, whereas the total costs are still capped at the macro level. This means that hospitals still have incentives to keep effort and costs low and the macro cap still creates an extra cost containment incentive. The difference between the system in 2012-2014 and the current system is that now there is one integrated control model for the total expenditures on medical specialists care, and that the hospitals now receive one overall fee and negotiate with the medical specialist on their remuneration. This gives hospitals both the option and responsibility to create cost containment incentives for medical specialists. In the new participation model both the hospital and the medical specialist have an interest in the financial health of the hospital and thus have the same incentive for cost containment. However, as said in paragraph 3.2.1, this model is currently not in use by any hospitals. In the cooperation model, the hospitals pay the medical specialists via the MSB. In that model it is thus important for hospitals to align the incentives for the medical specialists to get them to contribute to the goal of cost containment. When the hospital pays the medical specialist a completely fixed remuneration, this payment form resembles a salary or budget, even when the medical specialist works independently. The hospital can also pay the medical specialist a part of each claimed DOT, which resembles a case-mix payment system. A third option is for the hospital to pay the medical specialist per action, which would be a fee-for-service payment system. In practice not much has changed yet in the way the fees that the hospital receives are transferred to the medical specialists. In 2015 only 19% of MSB's and 11% of hospitals had an arrangement with a fixed and variable component (Nza, 2015a). Hospitals do not seem aware enough that for example the possible fee cuts under the MBI should be translated into the arrangement with the medical specialists (NZa, 2015a). The degree of alignment of cost containment incentives for the hospital and medical specialists depends completely on the agreements between the hospital and health insurer and hospital and medical specialists. Hospitals have strong cost containment incentives and if they translate this into agreements with the medical specialists, the incentives are well aligned.

3.2.3 2014: Subsidy

In 2014 the Dutch government made a subsidy available for self-employed medical specialists that agreed to start working salaried, because the Minister felt that the incentives of salaried medical specialists are better in line with the incentives of the hospital (Rijksoverheid, 2016). Self-employed medical specialists could get compensation when they would start working salaried. The Minister made 125 million euro's available for this subsidy in 2014. However, the subsidy was not used much. In 2014 only 560 of the 10.000 self-

employed medical specialists have used the subsidy to start working salaried (Herderscheê, 2015). The sector argued that this was because the preconditions were too strict and they were amended for 2015 (Kiers, 2016). However, in 2015 only 449 medical specialists used the subsidy and this dropped to only 14 medical specialists in 2016 (Elsen, 2016).

3.2.4 Conclusion

In 2015 the payment system for hospitals and medical specialists was again changed, this time to integral funding. Since then the DOT-fees are not specified on the hospital costs and medical specialists' fees anymore and the total expenditures on medical specialist care are capped at the macro level. Hospitals are still paid either with a budget or case-mix system, dependent on the type of contract they have with the health insurer and they have an extra cost containment incentive. In this system the hospitals are responsible for paying the medical specialists and it is thus the hospital's task to create the optimal cost containment incentives for medical specialists.

3.3 Conclusion

The central question in this chapter was: "How were Dutch hospitals and medical specialist financed between 1995 and 2016 and what were the financial incentives for cost containment in those financing systems?". The payment system for hospitals and medical specialist have changed many times since 1995. The medical specialists that work directly for the hospital are paid a salary, which has not changed. The self-employed medical specialists had FFS incentives before 1995, budget incentives between 1995 and 2004 and between 2005 and 2007 for care in the A-segment. They had case-mix incentives between 2008 and 2011 and between 2005 and 2007 for care in the B-segment and they had budget incentives of between 2012 and 2016. The incentives for hospitals were those from a budget until 2000 and fee-for-service between 2001 and 2004. From 2005, the A-segment was financed with a budget and the B-segment with a case-mix system. In 2012 the payment system for both segments became capped at the macro level, which caused the incentives be like budget incentives. In 2015 the organizational models for hospitals and medical specialists changed and since then they can work together either in a cooperation model, participation model, or the medical specialists work salaried. The hospitals still had strong cost containment incentives and it is their task to translate this into agreements with cost containment incentives for medical specialists.

4. Analysis

In chapter 2 different payment systems for hospitals and medical specialists were discussed and the incentives for cost containment in those payment systems were analysed. In chapter 3 the financing systems for hospitals and medical specialists in the Dutch health care market were described. This chapter combines the information of the two chapters and analyses whether an effect of financial incentives in the different payment systems is found in practice. The main question in this chapter is:

"What are the consequences of the alignment of cost containment incentives in the different payment systems for hospitals and medical specialists on the level of the costs in the health care sector?"

To answer this question I will first take a look at some numerical data. Then I will use those data and other sources to analyse what happened to the costs of care over the years and I will analyse whether these changes are parallel the timing of changes in the payment systems for hospitals and medical specialist.

4.1 Data selection & charts

First I will briefly describe how I selected the data that I used to create the charts and what the limitations are. Then I will describe what the charts I created show.

4.1.1 Data

The Central Bureau for Statistics (*Centraal Bureau voor de Statistiek*, CBS) in the Netherlands collects and keeps a record of historical health expenditure data. From these data I selected total health care expenditures, which is defined as the sum of the expenses for preventive, curative and palliative care, social services, youth care and day care support. I also selected expenditures per capita and expenditures as a percentage of Gross Domestic Product (GDP). The CBS data before 1998 described the collectively financed health care, which thus excludes the privately financed health care. After 1998 the data describe the total health care, with all sources of financing, so including the privately financed health care. I decided to show both numbers from 1998 in the charts so that a possible change in total expenses due to the change in that year would not be misinterpreted. The data for 2015 and 2016 are still preliminary data.

The OECD also keeps data records on health care spending. Their definition of health care spending includes the final consumption of health care goods and services including personal health care (curative care, rehabilitative care, long-term care, ancillary services and

medical goods) and collective services (prevention and public health services as well as health administration).

Influences on health care expenditures

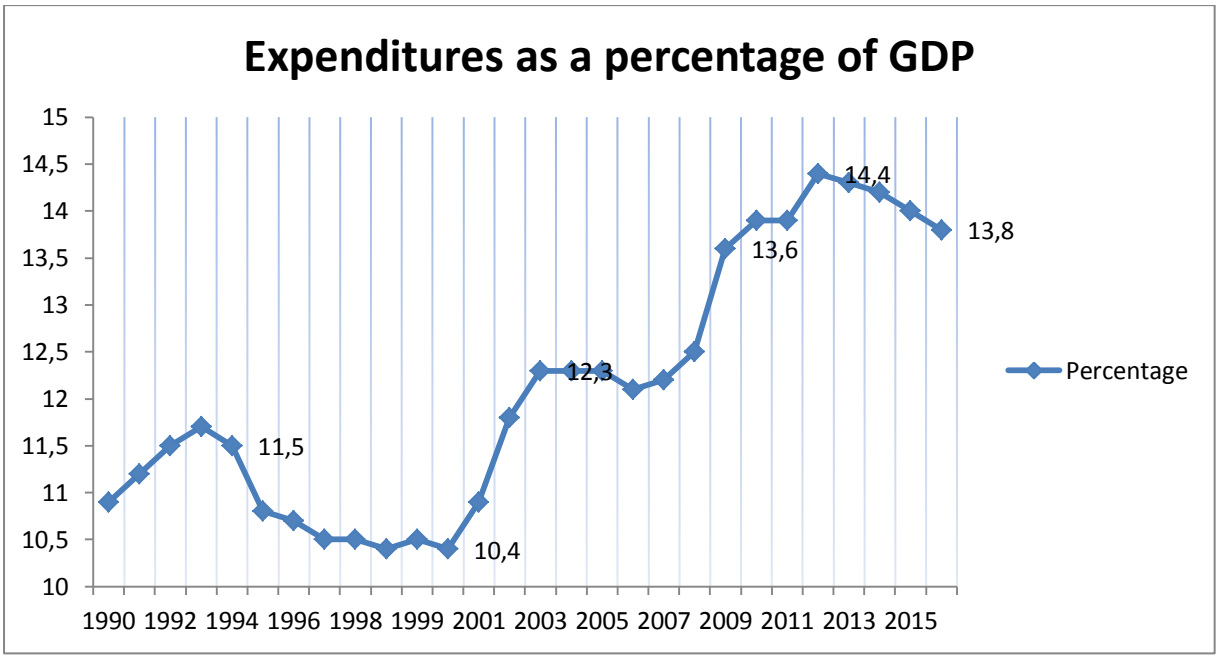
Both the data from the CBS and OECD contain many more sources of health care expenditures than only the spending on medical specialist care. However, of the total health care expenditures hospital care is the biggest sector with 27.5% of health care expenditures being spent on hospital care (NVZ, 2016). This means policies in other sectors can also impact the total health care expenditures, so changes in payment policies can probably not explain all fluctuations in the amount of GDP spent on health care. Also, changes in health care spending that can be explained by a change in payment policy do not necessarily represent a causal link. Further, expenditures on health care are a product of volumes and prices. In the charts it is not visible whether a change in costs is caused by a change in either quantity or prices of care, or both. A change in price can either be caused by a change in the absolute price for a certain treatment, or by care substitution, which is a shift in the type of care provided. The latter is, for example, a shift from secondary (more expensive) to primary (less expensive) care. Care substitution is measured with a product-mix number. This number is calculated as the effect of a relative change from cheaper or more expensive DBCs within a group of patients, where a positive change indicates a change to more expensive care (NZa, 2015c). All these influences on health care expenditures make that no absolute conclusions can be drawn based on the graphs, but at this moment these data on macro level are the only data available and they provide a nice illustration nonetheless.

4.1.2 Charts

For this analysis I created three charts. Figure 8 (see appendix) shows the development of the total expenditures on health care from CBS data. I included this figure to show how the total amount of expenditures on health care increased over the years. Figure 9 (see appendix) shows the development of the expenditures per capita from CBS data. I included this figure to correct the total expenditures for a growing population. Figure 5 shows the development of the expenditures on health care as a percentage of GDP from CBS data, which I included to correct the expenditures for a growing population and economy. Figure 6 also shows the development of the expenditures on health care as a percentage of GDP, but from OECD data. As discussed before, the OECD definition of health expenditures is somewhat different than the definition of the CBS. This can also be seen when looking at figure 5 and 6. Even though the trend is broadly the same, the underlying numbers are somewhat different. The numbers fluctuate less in the OECD data than in the CBS data,

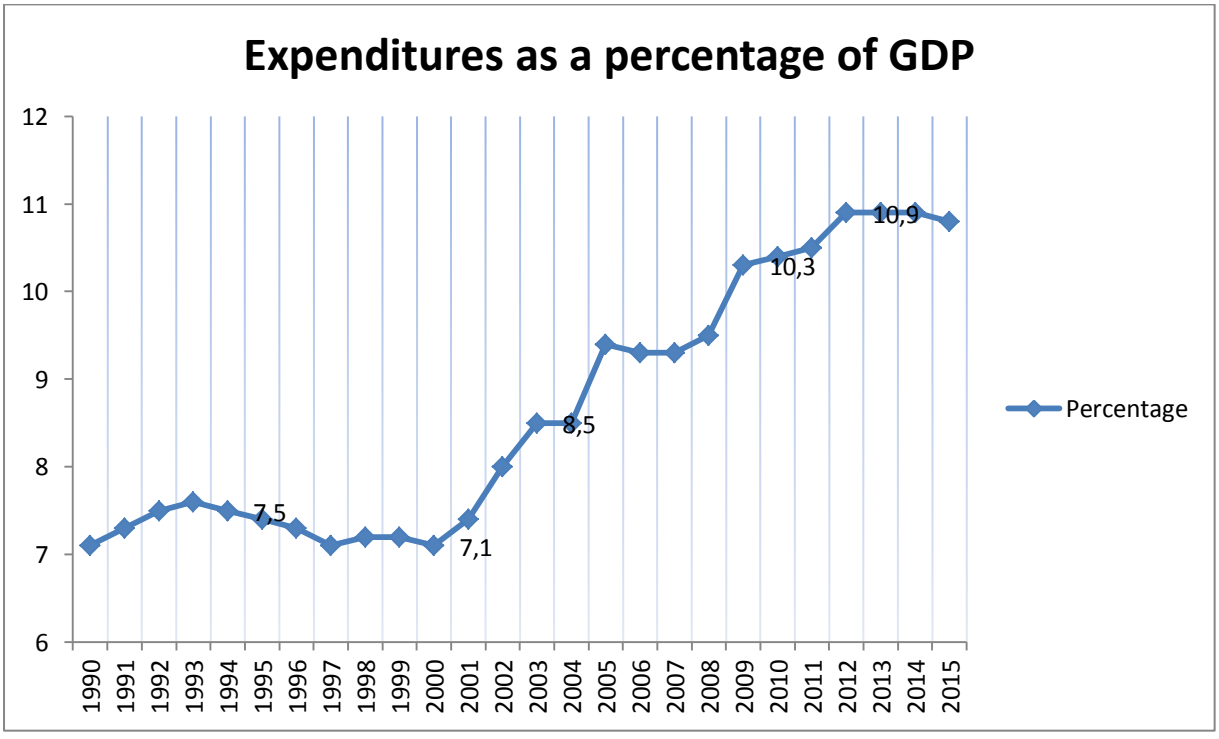
which can be explained by the fact that the definition from the CBS is broader than from the OECD.

Figure 5: Expenditures on health care as a percentage of GDP, CBS data



Source: CBS Statline

Figure 6: Expenditures on health care as a percentage of GDP, OECD data



Source: OECD Data

4.2 Data & chart analysis

In this paragraph I will analyse the figures and other sources and see what happened to the total costs of health care over the years. I will use a number of sources, like information from the Dutch Healthcare Authority (NZa) and the Dutch Hospital Association (NVZ) to determine how a change in payment policy may have influenced the costs.

4.2.1 1995-2000

Before 1995 the incentives for cost containment in the payment systems for hospitals and self-employed medical specialists were not aligned. In 1995 the payment systems for self-employed medical specialists changed from fee-for-service to budget and the incentives for cost containment for hospitals and medical specialists became aligned. The payment system after 1995 contained incentives for cost containment on both the macro and micro level. A fee-for-service payment system contains no incentives for cost containment and salary and budget contain incentives to keep costs at a low level, with a risk of increased waiting times and possible shortages of care. I would thus expect the health care expenditures in The Netherlands to decrease after 1995. Looking at figure 5, it can be seen that there is a decline in health expenditures as a part of GDP visible, from 11.5% of GDP in 1994 to 10.8% of GDP in 1995, after which the amount of GDP spent on health care stays quite stable.

Mot (2002) used the Dutch change from fee-for-service to budget in 1995 as a natural experiment to examine the impact of this change in payment system on the treatment of patients. She found that the change stimulated economical use of care. She also found that the experiment produced favourable and unfavourable effects, where the latter were mostly linked with the fact that the budget removed the production incentive and the created misalignment of the incentives for hospitals and medical specialists. Her conclusions were that it is important to have an incentive for production under a budget to keep efforts high, that there should be reliable production-indicators to control for creative coding as a reaction to the production incentive, that the hospital and the medical specialists should have aligned financial incentives, that the desire for cost control must be kept in relation to the desired result of health care and that it should be taken into account that financial incentives in one part of health care can lead to substitution to other parts (Mot, 2002). In chapter 2 it was shown that a budget payment system contains incentives for keeping costs low by having a low production and minimizing number and intensity of treatment, which Mot (2002) found evidence for. Furthermore, after 1995 the length of waiting lists started to rise, which indicates that there were shortages of care (Hasaart, 2011). It thus looks like this change in payment system for medical specialists from fee-for-service to a budget was effective for containing costs, including the negative effects that come with lower costs.

4.2.2 2001-2005

In response to the growing waiting lists, in 2001 the payment system for hospitals changed from budget to fee-for-service, which misaligned the incentives for cost containment for hospitals and medical specialists. Now, there were cost containment incentives on the micro level but not on the macro level. I would thus expect expenditures to increase somewhat. Looking at figure 5 it can be seen that the expenditures as a percentage of GDP, after being stable between 1995 and 2000, experience a sharp rise from 10.4% in 2000 to 12.3% in 2003. It thus seems that changing the payment system for hospitals from a budget to fee-for-service increased the total costs of health care. Then, in 2003, the rise of expenditures abruptly stopped, which could partly be explained by the efficiency discount, mentioned in paragraph 3.1.7, that was introduced in 2003 to counter the strong growth of expenditures.

4.2.3 2005-2007

In 2005 the payment system for hospitals changed again; from fee-for-service to budget in the A-segment and to case-mix in the B-segment. In that year, the payment system for medical specialists remained a budget for care in the A-segment and changed from budget to case-mix system for care in the B-segment. The incentives for cost containment were thus aligned in both the A- and B-segment; there were cost containment incentives on both the macro and micro level. It was shown that a fee-for-service payment system contains no incentives to contain costs, that a case-mix system contains both incentives that encourage and discourage cost containment and that a budget contains strong cost containment incentives. For hospitals the two new payment systems (budget and case-mix) both contained stronger cost containment incentives than the old payment system (fee-for-service). For medical specialists the payment system for care in the B-segment (case-mix) contained less cost containment incentives than the old payment system (budget). The payment systems after the change in 2005 thus contain stronger cost containment incentives for hospitals and somewhat weaker cost containment incentives for medical specialist. The expected influence on health care costs could thus be positive, negative or neutral. In figure 5 there is a small dip visible between 2005 and 2007.

Krabbe-Alkemade, Groot and Lindeboom (2017) did research on how the change from the (adjustable) budget system to the price competitive prospective reimbursement DTC system impacted the health care volume and cost. They found that the implementation of market-based competition led to relatively lower total costs, production volumes and number of activities overall. They found that the average costs for outpatient DBCs decreased due to a decrease in the number of activities per DBC and increased for inpatient DBCs, which is likely the result of more expensive activities. This could mean that relatively easy treatable patients are more often treated outpatient than inpatient, see also paragraph 4.2.7. This

would cause inpatient DBCs to be more expensive, but even though the costs of inpatient DBCs increase, overall costs would decrease.

4.2.4 2008-2011

In 2008 the payment system for medical specialists changed from budget to case-mix for care in the A-segment, which misaligned the cost containment incentives for hospitals and medical specialists in that segment, because the hospitals were still paid with a budget. The cost containment incentives for care in the A-segment were thus slightly smaller on micro level than on macro level. I would expect the health care expenditures as a percentage of GDP to increase somewhat after 2008. In figure 5 it can be seen that the expenditures as a percentage of GDP rose from 12.2% in 2007 to 12.5% in 2008. After that a sharp rise followed, to 13.6% in 2009. Total health care expenditures have also increased in those years, partly due to a sharp rise in the volume of care and partly because the remuneration of doctors has increased (OECD, 2012). According to the OECD (2012), the reforms in the health care sector between 2005 and 2011 have constrained the prices of hospital services in the B-segment, which suggest effective competition between hospitals. The NZa (2013b) notes that the DBC revenues have increased with 3.7% on average per year between 2008 and 2011, while the number of patients has increased with only 1.6% per year and the prices have decreased with 1.6% per year. They note that this revenue increase is due to the fact that patients more often go the hospital for multiple diseases, which caused the number of treatments and average costs per patient to rise. The OECD (2012) notes that health spending growth was lower in the Netherlands than in other European countries until 2008, but has since accelerated, reflecting faster growth in the volume of care, which can be seen in the graph.

Hasaart (2011) used two unique institutional features of the Dutch hospital sector to try to find evidence for the existence of PID in the Dutch health care market: 1. the coexistence of salaried and self-employed doctors in the Netherlands and 2. the coexistence of a regulated segment of hospital care and a liberalized segment. Her assumption was that only self-employed doctors have an incentive to manipulate supply in order to raise income, and that this incentive exists only in the liberalized segment of hospital care. She finds that the number of doctors is positively and significantly correlated with number of treatments, and that in most cases the estimated coefficient is larger for self-employed doctors than for salaried doctors, which offers some support for supplier-induced demand. She recognises that the negative coefficients in a few cases imply that there is an omitted variable problem. It thus seems that changing the payment system for medical specialists from a budget to a case-mix system positively influenced the amount of care provided.

4.2.5 2012-2014

In 2012 the payment systems changed again. Hospitals still claimed the provided care via a case-mix system, but they were paid with either a budget or a capped case-mix system with adjustable prices, which contains incentives to keep costs low. Also, total hospital costs were capped at the macro level under the voluntary agreement which made the cost containment incentives for hospitals even stronger. The medical specialists were still paid the fee component of each provided DOT, but the total medical specialist fees were also capped per hospital. The medical specialists thus also had an extra cost containment incentive compared to the previous payment system. The hospital and the medical specialist had aligned cost containment incentives (micro and macro level), so I would expect expenditures to decrease again after this change. Looking at figure 5 it can be seen that the expenditures after 2012 are indeed decreasing. According to the NZa (2015c) prices in the B-segment declined with 0.8% from 2012 to 2013. Hospital revenues have increased with 5% from 2012 to 2013 and with 0.6% in 2014 (NZa, 2015c). In 2012 prices for DOT's in the A-segment were on average 4.6% lower than the maximum tariffs, measured as the difference between the real claims and the revenues if maximum prices would have been used in all cases (NZa, 2015c). In 2013 the differences between prices and maximum tariffs became smaller, partly because information on real prices became better and insecurities became smaller (AR, 2016). In 2015 the revenues of the hospitals grew with 2.2%, which points to the fact that the hospitals stayed within the agreements of the voluntary agreement (NVZ, 2016). The AR (2016) concluded that the hospitals and medical specialists were mostly succesful in staying within the boundaries of the voluntary agreements of 2012 and that this has very likely contributed to the smaller growth of health care expenditures for the period 2012-2015. However, they also note that there are indications that the demand for hospital care decreased in 2012 and 2013, possibly caused by an increased deductible or a decreased purchasing power due to the financial and economic crisis (Algemene Rekenkamer, 2016). Also, waiting lists are growing again (NZa, 2017), so not all of the decrease in cost-growth can be contributed to the voluntary agreements. Overall, the voluntary agreement seems quite effective in stopping the high growth of health care costs.

4.2.6 2015

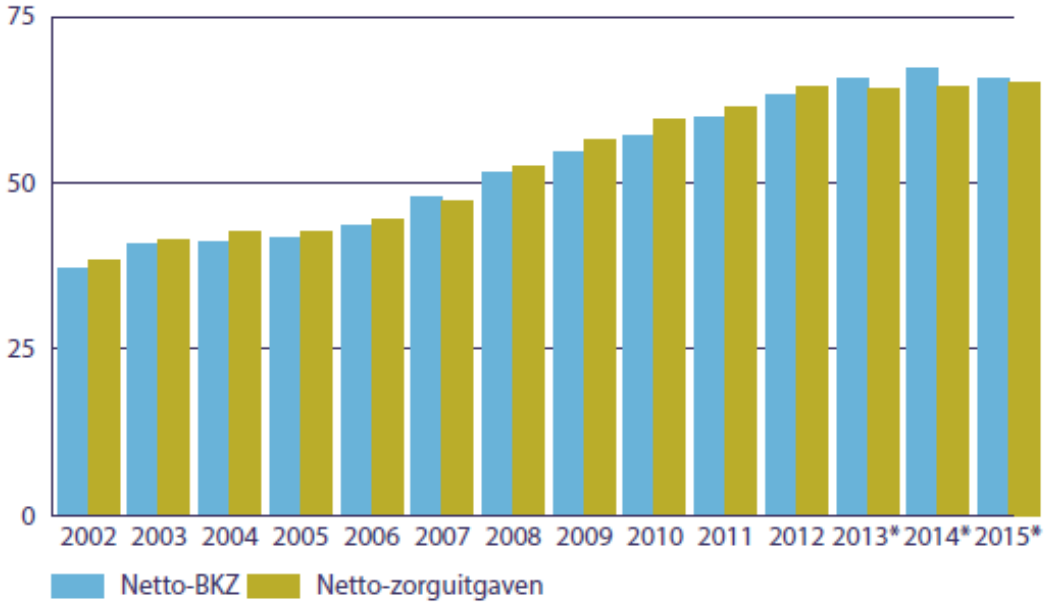
In 2015 the payment system for hospitals and medical specialists changed to integral funding. Since then the DOT-fees are not specified between the hospital costs and medical specialists' fees anymore and the total expenditures on hospital care are capped at the macro level. In this system the hospitals have cost containment incentives and the hospitals are paying the medical specialists, which gave them both the option and responsibility to create cost containment incentives for the medical specialists. If hospitals create cost

containment by specifying the agreements with the medical specialists, I would expect the cost growth to significantly slow down or even stop. In 2015 and 2016 the declining trend in the expenditures as a percentage of GDP continued, but it is too early to see whether the change in 2015 has any lasting effects on health care expenditures.

4.2.7 Cost containment - (In)effective BKZ

As discussed in paragraph 3.1.7 the BKZ was introduced in 1994. In 2011 the Auditor's General Office (*Algemene Rekenkamer,* AR) published an extensive report on the expenditures and BKZ exceedances in the health care sector. They concluded that the expenditures on health care consistently exceeded the BKZ until then. These cost overruns were partly expected, because the expected money inflow for the Dutch government is lower than the expected money outflow due to health care expenditures, which creates an expected and constant deficit in the Dutch government treasury. The cost overruns were partly unexpected, because the expenditures on medical specialist care each year exceed the estimated amount. These cost overruns were usually only noticed when they had already taken place. The AR concluded that there was not enough information about the development of the health care costs and that the Minister did not have enough options and did not use the available options enough to manage the expenditures (Algemene Rekenkamer, 2011). As stated in paragraph 3.1.7 there have been a number of budget cuts for hospitals over the years, for example in 2000, 2003, 2006, 2007, 2008 and 2011. So even though the BKZ budget was often adjusted and cut, this was not very effective in stopping health care costs from growing. In 2016 the AR published a new report which concluded that the health care sector was successful in staying within the boundaries of the BKZ in 2013, 2014 and 2015, see figure 7.

Figure 7. BKZ overruns and surpluses between 2002 and 2015



Source: Algemene Rekenkamer, 2016

The health insurers argued to the NZa that the pressure they can put on the prices in the A-segment is small, because those prices are automatically and generously indexed (AR, 2016). Also, overall health care prices are influenced by the agreements between the hospitals and health insurers. For example, if the hospital and health insurer have agreed on a case-mix payment system with a cap, when the budget cap is exceeded the pay per DTC declines, so the overall prices may differ from the ex-ante agreed prices.

The NZa (2015c) notes that at this point there is no good view on prices in health care, because there is not enough information available about the end-of-year adjustments of the prices negotiated between hospitals and health insurers. The NZa argues that there is more information needed when the hospitals and health insurers are working with a budget or capped case-mix system.

Medical specialist remuneration

The total costs of health care are also influenced by the fees and wages of medical specialists. Over 2007-2008, Specialists' total revenues increased by more than 20% per year and by 6.5% in 2009, while their number was growing by only 4-5% per year over that period (OECD, 2012). The Netherlands Bureau for Economic Policy Analysis (*Centraal Planbureau, CPB*) did research on the financial effects of making all medical specialists working salaried. It concluded that forcing all medical specialists to work salaried would not yield much in the first instance. It would cause medical specialists to work less hard and cost

about two billions euro over the first ten years and only start saving money after the tenth year, about 100 million euro a year (Kate, 2016).

Care substitution

The total health care expenditures are also influenced by the product-mix. A product-mix indicates the burden of care of patients in a specified patient-group. A positive change in the product-mix indicates that the burden of care is higher. Increases in the product-mix may indicate that 'lighter' patients are less often treated in the hospital, for example because these patients are more often treated in the less expensive primary care sector (NVZ, 2015). Krabbe-Alkemade, Groot and Lindeboom (2017) found this effect after the change of 2005 and according to the NZa (2015c) the number of patients for lighter forms of health care, like care for diabetes, is declining, which could point at care substitution. More positive care substitution will decrease the costs of health care.

Overall cost containment

The Dutch Hospital Association (*Nederlandse Vereniging van Ziekenhuizen*, NVZ) reported that the average growth of health care expenditures was 7.1% in the period 1998-2008 and only 2.6% in the period 2008-2015, uncorrected for price (NVZ, 2016). The growth of medical specialist care was 7.5% on average in the period 1998-2008 and only 3.0% between 2009 and 2016. Costs were thus contained better after 2008 than before.

4.3 Conclusion

The central question in this chapter was: "What are the consequences of the alignment of cost containment incentives in the different payment systems for hospitals and medical specialists on the level of the costs in the health care sector?". Looking at the analysis it seems that both the payment systems for medical specialists and hospitals influence the total expenditures on health care.

After the change in 1995, where the payment system for medical specialists changed from FFS to a budget, the incentives for cost containment on the micro and macro level were aligned. The expenditures as a percentage of GDP decreased, which is as expected because the new budget removed the production incentive. This change thus seemed effective for containing costs. The change from a fixed hospital budget to a flexible hospital budget in 2001, which represents a fee-for-service payment system, misaligned the cost containment incentives and seems to have increased the total costs of health care, which is in line with the expectations. The change in 2005, where the payment system for hospitals changed from fee-for-service to budget for care in the A-segment and to case-mix for care in

the B-segment and where the payment system for medical specialists remained budget in the A-segment and became case-mix in the B-segment, created an alignment of cost containment incentives. For hospitals the two new payment systems (budget and case-mix) both contained stronger cost containment incentives than the old payment system (fee-for-service). For medical specialists the payment system for care in the B-segment (case-mix) contained less cost containment incentives than the old payment system (budget), in the A-segment there was no change. The payment systems after the change in 2005 thus contain stronger cost containment incentives for hospitals and somewhat weaker cost containment incentives for medical specialist. In figure 5 there is a small dip visible between 2005 and 2007 and it was found that in the long run market-based competition led to relatively lower total costs, production volumes and number of activities overall. The change in 2008 misaligned the cost containment incentives for care in the A-segment, which I would expect to cause a rise in costs. A cost increase is visible in figure 5. As said before, this was caused by both an increase in the volume of care and in the remuneration of medical specialists (OECD, 2012). After the introduction of the voluntary agreements in 2012, the cost containment incentives for hospitals and medical specialists were aligned again so I would expect decreasing expenditures. There is a decrease visible in figure 5, so the expenditures follow the expectations. The change to integral funding in 2015 put the responsibility to create cost containment incentives for medical specialists at the hospital. If the hospitals would do this properly, I would expect expenditures to decrease further. The declining trend in figure 5 continues, but it is too early to see whether the change in 2015 has any lasting effects on health care expenditures.

Since 1994 the Dutch government has tried to contain health care costs with the BKZ. This has not turned out to be effective until 2012 because expenditures constantly exceeded the BKZ, caused by a lack of information and options for the minister to contain costs. Tariff cuts have also turned out to be ineffective. The voluntary agreements have been effective in keeping costs lower than the BKZ between 2012 and 2015. Overall, the NVZ reported that the growth of health care expenditures was lower after 2008 than before, which points to cost containment. However, the health care expenditures are influenced by many more factors than only the payment systems for hospitals and medical specialists. A couple of important determinants of health care costs are quantities, prices, wages and amount of health care substitution.

5. Conclusion

In this concluding chapter an answer to the research question is formulated. The research in this thesis is summarised and evaluated and implications of this research for future policies are given. Lastly, suggestions for further research are given.

5.1 Conclusion

The question around which this thesis is written is: “How well did the financial incentives in payment systems for medical specialists and hospitals in the Netherlands align their interests to contain costs in the period 1995-2016 and what effect did this have on the costs in the health care sector?”.

Based on the characteristics of the health care market (the existence of uncertainty that causes agency relationships) it follows that physicians have a double agency role in the health care market, which puts them in the position to in- or decrease the demand for care. Because health care providers respond to financial incentives, a change in the payment policy of those providers can influence the health care costs.

Health care provider payment systems can be classified with the typology developed by Jegers et al. (2002) and that typology can be used to deduct what incentives each payment systems will have. In practice, it has been found that capitation and budget both contain incentives for cost containment, case-mix contains incentives that both encourage and discourage cost containment and that fee-for-service and salary contain no incentives for cost containment. An efficient payment system contains the same cost containment incentives for both the hospital and the medical specialist.

Expenditures on health care are influenced by many factors, such as the quantity of care, prices of care, wages of medical specialists and care substitution. The government has tried to contain health care costs with cost containment incentives in the payment systems for hospitals and medical specialists. Over the years there have been many changes in the payment systems for hospitals and medical specialists in the Dutch health care market and the cost containment incentives in those payment systems were not always aligned. The incentives for cost containment for hospitals and medical specialists were mostly aligned between 1995 and 2000, between 2005 and 2007 and after 2012. The incentives were not so well aligned before 1995, between 2001 and 2004 and between 2008 and 2011. The containment of costs with an overall budget (the BKZ) does not seem to have been very effective in helping to contain costs.

After the payment policy change in 1995, which changed the payment of medical specialists from FFS to budget, the cost containment incentives for hospitals and medical

specialists were aligned (see figure 4) and the percentage of GDP spent on care decreased, visible in figure 5. In 2001 the budgets for hospitals became flexible because shortages of care had emerged over the past years, which misaligned the cost containment incentives for hospitals and medical specialists and the percentage of GDP spent on care increased, visible in figure 5. After the change of systems in 2005 (which was the introduction of market based competition with the DTC-system), the incentives for cost containment for hospitals and medical specialists were re-aligned for both the care in the A-segment and in the B-segment. Care in the A-segment was paid with a budget and care in the B-segment was paid case-mix, so in the A-segment there were strong cost containment incentives but in the B-segment there were both incentives that encouraged and discouraged cost containment (i.e. increasing the number of patients treated increased DTC-revenues). This introduction of market based competition and corresponding payment systems in 2005 thus contained stronger cost containment incentives for hospitals and somewhat weaker cost containment incentives for medical specialist than the system before 2005. The influence on health care costs could thus be positive, negative or neutral. In figure 5 there is a small dip visible. This change in payment system also led to relatively lower total costs, production volumes and number of activities overall. In 2008 (with the introduction of performance-based payment) the payment system for medical specialists changed to from budget to case-mix for the care in the A-segment (see figure 4), which created weaker cost containment incentives and misaligned the cost containment incentives between hospitals and medical specialists for care in the A-segment. The expected effect was that health care expenditures as a percentage of GDP would increase, which is visible in figure 5. It was argued that this was caused by both a rise in the volume of care and a rise in the medical specialists' fees. In 2012 the different parties in health care reached voluntary agreements to keep cost growth low, and since then the percentage of GDP spent on health care has been decreasing, visible in figure 5. Since 2015 (when integral funding was introduced) the hospitals have been responsible for creating and aligning the cost containment incentives for medical specialists. If the hospitals do this right, expenditures on care as a percentage of GDP is expected to decrease further. It is, however, too early to see what the actual effect of integral funding on health care expenditures is.

Overall, when the cost containment incentives in the payment systems for hospitals and medical specialists were aligned and present in payment systems, the expenditures on health care as a percentage of GDP showed a decrease. When cost containment incentives in the payment systems for the hospitals and medical specialists were not present, or became weaker, there was an increase in the expenditures on health care as a percentage of GDP visible. Looking at the analysis it thus seems that both the payment systems for medical specialists and hospitals influence the total expenditures on health care as a

percentage of GDP in the direction that can be expected from the theoretical incentives that the payment systems contain. In paragraph 5.3 it is discussed what we can learn from this.

5.2 Discussion

Good research is reliable, replicable and valid. Reliable means that the research is consistent and replicable means that the research is repeatable with the same outcomes. In chapters 1, 2 and 3 literature research was conducted. This is very reliable and replicable, because all literature can be reviewed again. The validity of research measures whether the research was conducted according to scientific standards. The analysis conducted in chapter 4 is a qualitative analysis. This provides a first step in finding the influence of a payment policy change on provider behaviour and the corresponding health care costs. To investigate this I looked at country-level data of the health care expenditures in the Netherlands. It would be ideal to have data on the health care costs over the years per individual provider, but currently this kind of data is not available. I am unsure that creating such data on a large scale will be beneficial to the health care sector, because this will create the need for a lot of administrative action, but it would provide the possibility of quantitative analysis. As discussed before, there are many factors that influence the costs in the health care sector and the incentives in the payment systems for hospitals and medical specialists are only a small part. The relationship between payment policies and health care costs must therefore be interpreted with caution. However, this research is a start in finding out what the influence of a change in payment policy on the health care costs is.

5.3 Policy implications

For years, the Dutch government has been trying to create the optimal health care system, but judging by the current situation the road ahead is still long as costs are high and rising and waiting lists are growing. In this paragraph I will discuss what can be learned from the changes in payment systems and corresponding changes in expenditures as a percentage of GDP. I will provide recommendations as to what steps to can be taken towards improving the payment systems for hospitals and medical specialists and I will discuss the opportunities and challenges of these improvements.

Lesson 1: Create aligned cost containment incentives

Over the years, creating aligned cost containment incentives in the payment systems for hospitals and medical specialists went hand in hand with a decrease in the health care costs as a percentage of GDP. The policy changes in 1995 (both hospitals and medical specialists were paid with a budget) and 2012 (introduction of voluntary agreements) seem most

effective in containing costs because after these changes the percentage of GDP spent on health care decreased. The policy change in 2005 (the providers were paid with a budget and case-mix system) seems effective until 2008 (when performance-based payment was introduced). This is as expected because the payment systems introduced in 1995, 2005 and 2012 are mostly fixed (which stimulates a low production) and prospective (which stimulates cost containment). Any future payment systems should thus create aligned cost containment incentives for hospitals and medical specialists.

Lesson 2: Don't focus only on cost containment

To stop the health care costs from rising one could put many cost containment incentives in the payment systems for hospitals and medical specialists. However, simply decreasing the costs of health care does not happen without some negative consequences, whether in the quantity or quality of care. For example, after the policy change in 1995 waiting lists emerged and since the change in 2012 waiting lists have been growing again, which puts pressure on the Dutch healthcare goal of accessibility. Therefore, in any future payment system, focus should not be put on cost containment only, but also on the two other goals of health care, quality and accessibility.

Lesson 3: Make sure integral funding is rolled out as intended

If integral funding is implemented as the Minister of Health intended, I expect it to further help containing the costs of health care. In the participation model (which the Minister of Health sees as the final form) the medical specialists, who are the ones that ultimately decide on the amount of care to provide, share the profits and losses of the hospital. They therefore feel a very direct financial incentive to contain costs. However, currently the self-employed medical specialists have mostly chosen to use the cooperation model, in which the incentives for the MSB and hospital can be conflicting, which puts more pressure on the hospitals to create cost containment incentives for the medical specialists. In practice, not much has changed in the way the hospital transfers the fees to the medical specialists and hospitals do not seem aware enough that financial responsibility should be shared with the medical specialists. For the medical specialists, there are little incentives to move from the cooperation model to the participation model, because in the cooperation model the medical specialists carry no financial risk. The Minister of Health should thus invest time and money to make the hospitals aware of the fact that it is their responsibility to create cost containment incentives for the medical specialists and of the fact that the hospitals will benefit if they create the right incentives for the medical specialists.

Lesson 4: Use mixed payment systems to offset negative consequences

Paragraph 2.2.2 showed that using mixed payment systems is favourable over a pure form payment system because it can offset the negative consequences of a pure form payment system. Hospitals should thus remunerate both salaried and self-employed medical specialists with a fixed basis payment and a variable supplemental payment.

Lesson 5: Use performance-based payment to stimulate the provision of efficient care

To optimise the health care system further, a pay-for-performance system can be used to create value-based health care, which maximizes the value of health care for the patient and minimises the costs. The variable supplemental payment mentioned in lesson 4 can be used to stimulate providers to give the most efficient care available. For example, providers could receive a higher supplemental payment when more efficient care is given. Providers are then stimulated to always find the most efficient treatment and only when that treatment does not work, a less efficient treatment should be given. However, implementing such a pay-for-performance payment system creates a problem that is twofold.

First, 'efficient care' must be defined and second, the right performance indicators must be used to measure efficiency (see lesson 6). In economics, efficiency consists of technical and allocative efficiency, which is producing the maximum amount of output from a given amount of input (or producing a given output with minimum input) and producing at minimum cost given input prices or maximising revenue given output prices, respectively (Hollingsworth, 2008). However, 'efficient care' should not only take output (like hospital days or number of discharges) and costs into account, but it should address the three goals of the Dutch health care system. It should also address the values of the different stakeholders, because each stakeholder values the components of care differently. Measures of quality (efficiency) generally fall into three broad categories: 1. Structure, 2. Process or 3. Outcomes (Donabedian, 1988), examples of which are 'having a specialist available at all times', 'complying with recommended screenings' and 'mortality' respectively. In health care, outcomes are not always a direct result of given treatment, which makes outcomes a less suitable measure of quality, so structure and process measure should be used mostly. A disadvantage of using performance-based payment is that providers can get frustrated when they do not reach the maximum payment, which creates a hostile work environment (Lagace, 2003). Therefore the measurement of quality should entail only factors that are directly a result of provider actions.

My suggestion is to measure quality by finding which aspects of quality are important for each stakeholder (i.e. patients, physicians, payers) and adding weights to those aspects based on the importance of each aspect. Measuring quality this way will stimulate physicians to take adequate care of patient preferences, which will reduce agency problems (Schut,

1995). Because stakeholders have different interests no form of care can be perfectly efficient, but defining efficiency this way will give the opportunity to rate different treatments based on the satisfaction they create for the stakeholders.

Lesson 6: Develop the right performance indicators

To be able to reward giving efficient care, the right performance indicators must be tied to the definition of efficient care. Performance should be measured with Key Performance Indicators (KPI's) (Parmenter, 2015). KPI's should be parameters derived from quality indicators that are difficult to influence directly, to prevent health care providers from focussing only on KPI's and neglecting other care areas. Further, patient satisfaction should be a very important KPI because ultimately good care is not only care that makes patients better but also involves satisfying patients. A problem with measuring performance with indicators is that providers strongly focus on those indicators to increase the reward. The perfect payment system for health care providers would be a system that strongly stimulates creating high quality care by directly linking all payment to quality indicators. However, in practice it is impossible to cover all possible actions that create quality, because this would make the system unnecessary complicated. Also, covering many actions creates a lot of administration, which is undesirable. Therefore, efficiency should be measured with, for example, 50% patient-satisfaction KPI's and 50% other KPI's.

Lesson 7: Create rest in the system

The problem of rising health care costs is almost as old as the system itself. Much research has been done, many solutions have been proposed and yet a durable solution has still not been implemented. This is partly because after the implementation of systems that helped containing costs (1995, 2005 and 2012), unforeseen consequences occurred (like waiting lists), which were subsequently countered with 'quick fixes' that altered the system but did not address the root of the problem.

Voices are rising to introduce 'population funding' (*populatiebekostiging)* for care in the Netherlands, which means that providers receive a fee per resident in their population (Ikkersheim, 2013), which is a form of capitation payment. Capitation payment might be a nice solution for funding primary care, but in its pure form it is not suitable as a payment system for medical specialist care, because the difference in cost between different medical specialist treatments is much bigger than the difference in costs between different primary care treatments, which makes the risk of undertreatment in medical specialist care much bigger (Ikkersheim, 2013).

Another path that could be taken to a high-quality health care system is integrating health care providers into Health Maintenance organisations (HMO), which are organised

care delivery systems, placing as many health care services as possible under one roof. An example of such a system that works is Kaiser Permanente (www.kaiserpermanente.org) in the USA. HMO's have many advantages, such as: reduced administrative actions, smaller chance of mistakes and better coordination between providers (because providers work together), insurer ability to control costs (because the providers' incentives are aligned with the insurer's incentives) and more focus on preventive care (Ho, 2009). Disadvantages of HMO's include limited provider choice for patients, risk of a monopoly position for the HMO (which creates the need of strong provider competition) and the need for risk selection, premium differentiation or risk equalisation (Ho, 2009). Creating HMO's is difficult because it is hard to attract enough patients fast (health care is a reputation good) and patients experience switching costs. Also, it is important that an HMO does not only attract very sick patients (that benefit most from the coordination), but also healthy (cheap) patients. Kaiser Permanente is successful because it has been around since 1945 and has continuously been improving in the right direction, but the lack of other well-working HMO's shows how difficult it is to start one successfully (Abelson, 2013). In short, creating a HMO provider system could be a very good health care system, but the difficulties are problematic to overcome and I am unsure whether in a small country like The Netherlands competition between HMO's can be strong enough to guarantee enough HMO competition.

Based on the research conducted in this thesis my suggestion to the Minister of Health would be to start with creating rest in the Dutch health care system. Between 1995 and 2015 five big provider payment changes have been implemented, which equals implementing a new payment system roughly every four years. Integral funding should be rolled out as intended (lesson 3) and then the market should be given time to work, as is also the advice of the NZa (2017), to make sure it can start working properly and to prevent yet another system from being implemented in a rush. After the medical specialists have started sharing financial responsibility with the hospitals (whether that be in the cooperation or participation model), it should be considered whether the financial incentives for medical specialists are already strong enough or whether performance-based payment should be introduced additionally. If performance-based payment is desirable, providers should be paid with the DOT system and a supplementary payment for performance (lesson 5). At first the variable part should be small and increased over time, to make it easier to fix errors in the pay-for-performance system. The basis (DOT) payment should never be completely abandoned because it is impossible to cover all actions with a performance system (like doing research or innovation). This way quantity and quality of health care are maximised and costs are minimised.

5.4 Suggestions for further research

Based on this research, several recommendations can be made. As discussed, the research conducted in this thesis is qualitative research, partly because there is no solid quantitative data on the incentives in payment systems and the behaviour of medical specialists and hospitals and the corresponding health care costs available. Collecting quantitative data will give the ability to make harder statements about the influence of financial incentives in payment systems for hospitals and medical specialists on the costs of medical specialist care, and health care in general. When the health care market of regulated competition has been given time to work, it should be researched whether the medical specialists are sharing enough financial responsibility with the hospitals for them to help containing costs effectively. Also, further research could be done on the effects of performance-based financing for hospitals and medical specialists. In the recommendations different financing models are mentioned but effects and suitability of these models need to be further explored before proposing them as appropriate for the Dutch health care market. Finally, conducting an analysis of payment systems in other European counties will give a nice overview of the systems in other (comparable) countries and their effects on the health care costs, which can help designing a better system for The Netherlands.

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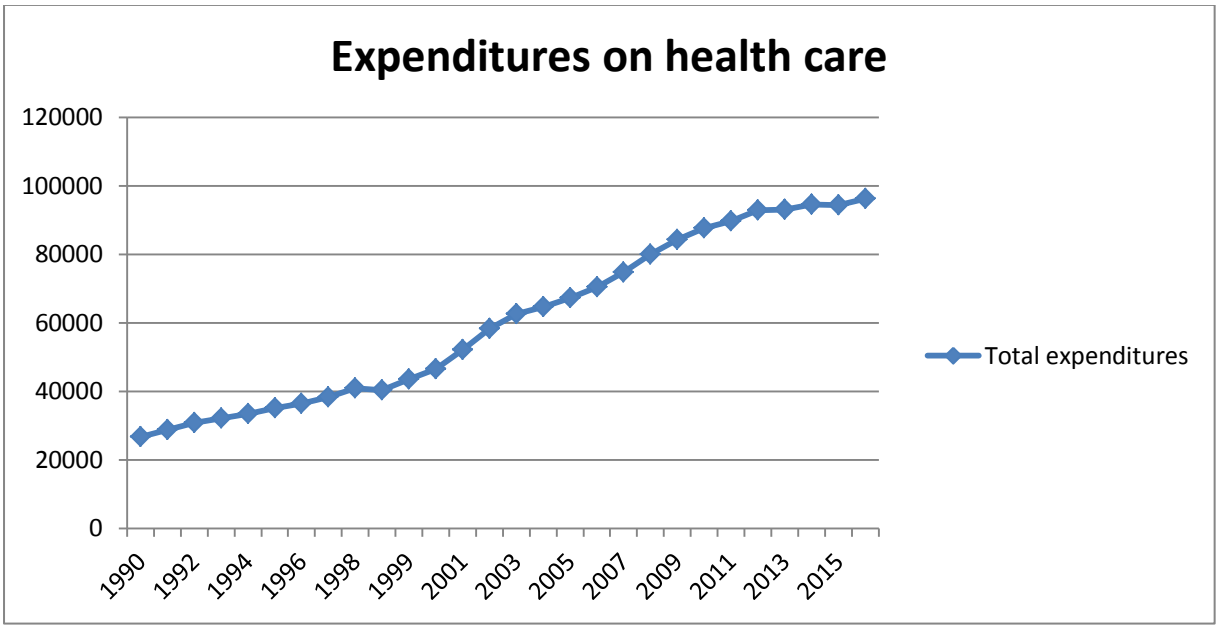
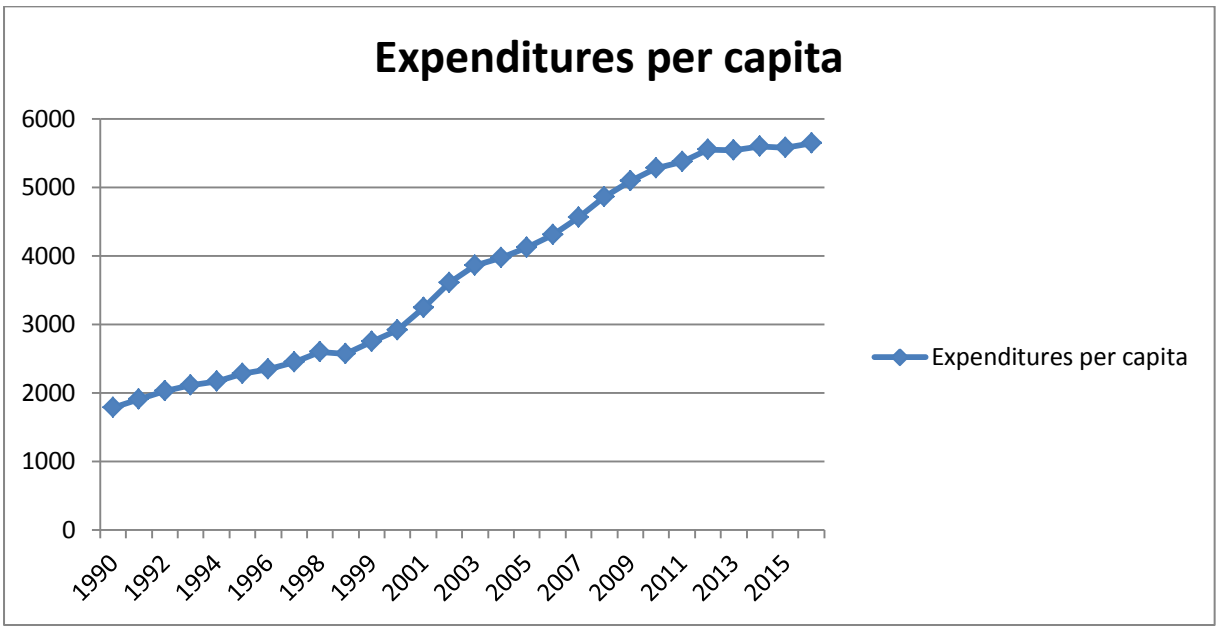
Appendix

Figure 8: Total expenditures on health care



Source: CBS Statline

Figure 9: Expenditures per capita on health care



Source: CBS Statline