Thesis

To obtain the academic degree Master of Science

Underfunding of German hospitals – background, causes, and solution ideas

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<th>Description</th>
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<tbody>
<tr>
<td>AG</td>
<td>Aktiengesellschaft (public limited company)</td>
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<tr>
<td>CT</td>
<td>computer tomography</td>
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<tr>
<td>DKG</td>
<td>Deutsche Krankenhausgesellschaft (German Hospital Federation)</td>
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<tr>
<td>DRG</td>
<td>Diagnostic-Related Groups</td>
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<tr>
<td>EMNID</td>
<td>TNS Emnid GmbH &amp; Co. KG – Erforschung der öffentlichen Meinung, Marktforschung, Nachrichten, Informationen und Dienstleistungen (name of a German opinion research center)</td>
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<tr>
<td>GDP</td>
<td>gross domestic product</td>
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<td>HCFA</td>
<td>Health Care Financing Administration</td>
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<td>HIV</td>
<td>human immunodeficiency virus</td>
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<tr>
<td>ICD</td>
<td>International Statistical Classification of Diseases and Related Health Problems</td>
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<tr>
<td>ICD</td>
<td>implantable cardioverter defibrillator</td>
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<tr>
<td>InEK</td>
<td>Institut für das Entgeltsystem im Krankenhaus (Institute for the Hospital Remuneration System)</td>
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<tr>
<td>KHEntG</td>
<td>Krankenhausentgeltgesetz</td>
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<tr>
<td>KHG</td>
<td>Krankenhausfinanzierungsgesetz (Hospital Financing Act)</td>
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<tr>
<td>LOS</td>
<td>length of stay</td>
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<tr>
<td>MDK</td>
<td>Medical Service of the Health Funds</td>
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<tr>
<td>MRT</td>
<td>magnetic resonance tomography</td>
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<tr>
<td>NRW</td>
<td>Northrhine-Westphalia</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<tr>
<td>OPS</td>
<td>Operationen- und Prozedurenschlüssel (Operation and Procedure Code)</td>
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<tr>
<td>PCS</td>
<td>patient classification system</td>
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<tr>
<td>PPP</td>
<td>public-private partnership</td>
</tr>
<tr>
<td>SGB</td>
<td>Sozialgesetzbuch (social security code)</td>
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SPECTARIS  Deutsche Industrieverband für optische, medizinische und mechatronische Technologien e.V (German industrial association for optical, medical and mechatronic technologies)
S1 Speaker 1 (here: interviewer)
S2 Speaker 2 (here: interviewee)
WHO  World Health Organization
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Abstract

The German hospital sector is undergoing radical changes, which will sustainably influence the health care for the population. Competitive structures have been implemented through the introduction of the German Diagnosis Related Groups (G-DRGs) in the years after the millennium in order to counter the threat of increasing expenditures. While private hospitals have successfully adapted to these circumstances, a large number of public hospitals is not able to operate profitably. Moreover, the financially stricken Federal States are shirking their responsibilities to fund necessary investments. A sufficient hospital financing regulated by law is no longer guaranteed. This work aims to analyze the background and causes for the structural underfunding of German hospitals and to elaborate possible solution ideas how to solve these problems.
1. Introduction

1.1 Problem Definition

With more than 2,000 hospitals, Germany provides a system of dense and area-wide health care. However, the majority of German hospitals is confronted with serious problems. According to Augurzky, Krolop, Hentschker, Pilny, and Schmidt (2014) about 40% of all general hospitals were in the red in 2012. Schreiner (2013) holds that over the past years, hospitals were facing ever-increasing amounts of cutbacks and limitations, without being able to stop this development. Even university hospitals and previously well-running infirmaries slide more and more into a situation were their costs exceed their financial resources. A contemporary solution is not in sight. For the near future, the management of hospitals await the negative trend to continue. According to a survey within the hospital report "Krankenhaus-Barometer", only 22% of hospital managements expect their situation to become better in the near future (Klauber, Geraedts, Friedrich, & Wasem, 2014, p. 254).

The underfunding of German hospitals has become a structural problem. An often-cited reason for the problematic situation is the segregation of cost and revenue, regulated by law. While revenue opportunities are restricted, costs are exposed to mechanisms of free market economy. As in almost all developed countries, cost pressure has become omnipresent also in German hospitals (Klauber, 2010, p. 4). In 2012, the total costs of the German hospital sector summed up to 74.47 billion Euros, which was almost one third of all national expenses for health (Statistisches Bundesamt, 2013). Looking at the years between 2002 and 2012, costs for German hospitals increased continuously and are now 36% higher than they were ten years before (Bölt & Graf, 2012). Many experts, such as Klauber (2010) and Schreiner (2013) explain these upward movements with increasing demands of our society on medical-technical standards, rising personnel and material costs and an enlargement of bureaucratic expenditures. They criticize that at the same time however, the basis for hospital funding did not develop accordingly.

The legal basis for the hospital financing system we have today was set in 1972 with the Hospital Financing Act ("Krankenhausfinanzierungsgesetz – KHG"). It governs the principal provisions of hospital care, including guidelines for hospital planning and funding. Aim of this federal framework law was and still is to ensure the economic
viability of hospitals for a demand-oriented medical care of the population with hospitals that are able to operate effective, economically independent and at socially affordable hospital and nursing charges ("Pflegesätze") (compare § 1 KHG of 1972). Since then, German hospitals finance themselves within a two-tier system distinguishing between operating costs and investment costs. Hospitals' operating costs are covered mainly by the use of hospital services of patients. Hence, hospitals receive an income stream from statutory health insurances, and partially from self-paying patients or private health insurances. In addition, public authorities finance expenses for the construction of hospitals, their maintenance, extension building, and the purchase of equipment such as medical devices and beds. The years before this dual-financing system was introduced, hospitals had hard times financing their investment needs. The Hospital Financing Act allowed, shifting the financial responsibility to the public budget (Laschober, Wiley, & Gelband, 1995, p. 76). What was once meant to establish a solid basis for the health sector has become a key driver for the problems in the sector today. The system-wide underfunding is a result of many years with decreases of necessary investments by the financially stricken Federal States ("Bundesländer"). Due to empty public coffers it has not become unusual that hospitals have to wait up to 10 years for an approval for investments (Viering & Söhnle, 2010, p. 6). While the overall economic investment ratio averaged 17.6 % in the last years, it was only five percent in the hospital market (Elbel, Sanne, Eckert, Teuber, & Möller, 2013, p. 3). The German Hospital Federation ("Deutsche Krankenhausgesellschaft – DKG") estimates the backlog of such investments to amount about 50 billion Euros (Spectaris, 2010). According to calculations of the Federal Ministry of Health this sum is increasing by five billion every year (Viering & Söhnle, 2010, p. 5). As a consequence, necessary investments oftentimes have to be funded by the hospitals themselves out of their operating income or be postponed. This can become a dilemma for hospital managers: In times when total costs of hospitals not seldom exceed their revenues, the budget for investments are often exhausted. On the other hand, the opportunities to increase operational efficiency and decrease costs are limited without new investments in building or technical structures. Especially smaller hospitals are in danger of bankruptcy without the implementation of measures to increase productivity (Schmidt, 2009, p. 25).
Even though many hospitals claim that the mandatory introduction of the cost orientation rate in 2004, Diagnostic Related Groups (DRG), tended to aggravate the already tense financial situation of hospitals, the effects are discussed controversially. Nonetheless, a glance at the statistics reveals that the changeover from per diem rates, which were paid regardless of actual costs to a pre defined cost orientation rate put pressure on hospital management to reduce costs associated with the period of hospitalization. The trend to shorter stays was accelerated by advanced surgery methods and new approaches that allow a reduced post-operative mobilization. Despite the reduction of German hospitals and a decreasing number of beds by almost 10 % within the last ten years, hospitals were not able to prevent a shrinking bed occupancy rate (Viering & Söhnle, 2010, p. 7).

Furthermore, growing transparency as well as a higher mobility and self-reliance of patients led to stronger competition between hospitals on a regional basis. Hospitals as well as provider of ambulant services are entering more frequently than ever into direct competition. Because of this pressure, hospitals oftentimes needed to abandon non-profitable or locally redundant departments. In many cases even centers or entire hospitals had to be shut down (Elbel et al., 2013, p. 3). A clear trend of consolidation can be observed for several years. Private operators were the first to systematically acquire struggling public hospitals. Not as numerous as public hospitals, but increasingly frequent charitable hospitals are now being absorbed, too. Also, takeovers and mergers between private operators have become common. Apart from takeovers, experience has shown that this development led to a trend from an individual hospital to merged networks. More and more hospitals become part of an integrated network in order to realize synergy effects through streamlining, shared investments, reorganization of business procedures or even their strategic choice of services offered, striving for existence in the market (Busse & Geissler, 2013, p. 10).

1.2 Objective

Against the backdrop of this development, it is evident that the hospitals market faces a radical change that is to affect our health care system to a significant extent. However, a sufficient hospital financing regulated by law is no longer guaranteed. Professionals from all involved parties in the sector such as hospital operators, hospital associations, consultancies, accountancy firms, banks, medical engineering firms, and construction
enterprises agree in the point that it will not be possible to reserve the backlog of investments out of public funds. There are many good arguments that more money should be provided to the German health system. However, this would be tantamount to the consumption of additional tax-funds or health insurance contributions. A few years after the financial crisis and in the middle of the European public debt crisis, it would be dangerous to just rest on those claims. The households of the Federal States are already cash-strapped today. Considering the commitment of German politicians in 2009 to introduce a debt break makes it unlikely that Federal States will be able to provide more funds for investment activities of hospitals in the future. The debt break forces the federal government to cut its structural deficit to 0.35 % of gross domestic product (GDP) by 2016 whereas the states have to decrease theirs even to zero until 2020 (Bundesministerium der Finanzen, 2014, p. 19). Under these circumstances, it is absolutely indispensable to identify and evaluate actual drivers behind the crisis in order to understand the possibilities for alternative solutions to close the current funding gap.

1.3 Course of Investigation

The topic of underfunded hospitals in Germany is covered in two parts, namely a theoretical and a practical part. First, chapter 2 forms the theoretical part, which elaborates the background and causes based on a historical and current review of the country's regulations for the hospital sector, the ownership structure as well as the development of hospital financing and planning. However, the goal of the thesis is not to only show the explicit issues of the system, but also to find solution approaches for the precarious financial situation. Although the theoretical part already points out reasons for the financial situation of German hospitals, a more detailed analysis of reasons for the underfunding of hospitals is conducted within the practical part in chapter 3. After the theoretical analysis, it remains unclear if and to what extent the new regulations contributed to the crisis. Moreover, interest groups drive almost any kind of literature about hospital funding. Therefore, it is necessary to first conduct comprehensive interviews with experts of those different interest groups before going into a deeper analysis. Chapter 3 outlines the main interview results, which contain central causes for the underfunding of hospitals. These are critically discussed and – if applicable – reviewed from different perspectives. Finally, chapter 4 summarizes key findings of the paper and tries to develop possible solution ideas.
Even though financial concerns and quality of health care issues cannot be clearly separated, the focus is drawn exclusively to economic matters. An inclusion of an analysis of specific impacts on quality would require very detailed medical knowledge. Moreover, this thesis is not intended to be a tutorial to develop solutions for crisis-ridden hospitals. Rather, it should provide an understanding of the complex financing mechanisms in the sector and outline current key issues in order to come up with possible solution ideas from an overall perspective.

2. Underfunded Hospitals – Background Analysis and Status Quo

2.1 The German Hospital Sector

2.1.1 The Hospital Sector as an Economic Market – Eligibility and Limitations

As controversial the views of the different parties involved in the hospital sector might be, they all commonly agree in the point that the sector failed to be a functioning market. If and to what extent a shift from governmental planning to free market mechanisms in the hospital sector is the appropriate methodology to approach current problems, has become subject of permanent discussion. There are diverging views and assessments on the importance of economy for the sector, mainly driven by financial interests of the different participants. The mere fact that German health care expenditures of 300 billion Dollars in 2012 amounted 11.3 % of total GDP, of which hospitals alone account for 24.8 %, shows that the sector cannot evade from economic relevance (Gesundheitsberichterstattung des Bundes, 2014). In order to better get the idea behind different arguments about that topic and recent regulations, it is important to gain an understanding of the eligibility and limitations of the hospital sectors to become a free market.

Per definition in economic theory, a free market is defined as a mechanism in which sellers and buyers exchange goods and services at prices solely driven by the power of demand and supply. Any other forces like monopoly power or government control are not given or negligibly small. The basis for perfect competition is given when every participant is a price taker and no one is able to influence the price of the good it buys or sells. No party has more or better information than the other (Pindyck, 2004, p. 616). This runs contrary to regulated markets, where interventions take place through laws that restrict those market mechanisms or predefine prices. Only a free market allows
allocating scarce resources pareto-efficient, meaning that it is just possible to make one party better off, when making another worse off (Rowley & Schneider, 2005, p. 252). In a market that comprises such characteristics, the allocation of resources generates more efficient results than it would under any form of regulation (Stiglitz, 2000, pp. 57-58). Only in the absence of artificial barriers innovation can evolve prosperous allowing products and services to adapt optimally to the needs of their demanders (Greaves, 1977, p. 200). However, those mechanisms only can unfold their effects when the market fulfills several requirements of perfect competition.

The hospital sector however, is far away from fulfilling the requirements of a free market. It is even characterized by the fact that it entails multiple attributes for market failure simultaneously (Hilgers, 2011, p. 10). Fundamentally, the first substantial economic difference between the health sector and other service industries lies in that the exchange of services does not take place between two participants, but three parties that compose the market. First, there are insurance holders respectively patients who are in need of medical care. The opposite site consists of the providers of such medical care: Hospitals, registered doctors and pharmacies. In contrast to other services, the compensation is not paid by their demanders, but by a system of statutory and private health insurers. Therefore, the health care market is often divided into three parts, which are the market of medical care providers, the financing market, and the contract market (Schlüchtermann, 2013). Figure 1 illustrates a triangle of the involved parties.
All those three submarkets show considerable limitations of competition. It is neither true that suppliers and demanders in the three markets displayed in figure 1 possess equal power, nor do they have equal information. The relationship between a patient and a treating physician is the most obvious example to explain that asymmetric information are inherent in the health care market. Because of the complexity of medical matters and due to the fact that most people have very little knowledge about medical treatment when they become confronted with health problems, it is clear that physicians have a distinct information advantage over patients (Hilgers, 2011, p. 10). Unlike in many other markets, in which customers can easily acquire knowledge about services and products offered, patients are always forced to rely on physicians to a certain extent, which can result in moral hazard. Even though the number of internet offerings for patients increase, it is impossible for patients to put on an equal footing with physicians who have specialized know-how and years of experience (Schlüchtermann, 2013). This gives them the possibility to opportunistically influence the patients' decision and therefore to shift or even create new demand. In the same way, there is also asymmetric information between the providers of medical care and insurers (Frank, Glazer, & McGuire, 2000, pp. 830-831). Patients are in the weakest position
since they have an information deficit against both, physicians and insurers. Therefore, the legislator intervenes with giving protection to the patients by the legal obligation imposed upon public insurers to permit everyone a contract. Selection processes that differentiate between potential insurers using actuarial methods are only allowed to private health insurers. In addition, patients who have a statutory health insurance get assured through the reimbursement of costs and the principle of benefits in kind. An obligation to conclude a contract also persists in the financing market: Insurers have to enter contractual relationships with medical care providers who overcame the market entry barrier to be included in the demand planning of its Federal State. Thereby insurers agree to pay incurring costs of their services. Furthermore, the lack of information for patients prevents perfect competition in the market of medical care providers. Patients, who can freely choose among different hospitals or ambulant practices, are not able to identify prices and quality of their medical services offered. This is especially due to complexity and heterogeneity of medical treatment. In rural areas, this condition is intensified through the low number of hospitals that oftentimes result in monopoly power. The structure of the sector is also open for moral hazard by patients. Lauterbach (2010) outlines two types of behavior changes that cause a welfare loss for the society. First, through ex-ante-moral-hazard, as is empirically proven that people tend to behave less risk-averse if they know a third party is responsible for potential costs. Relating to health insurances, this can be explained by the example of people participating in extreme sports. The second type of moral hazard occurs ex-post: Because not the patients, but the health insurances are the ones who bear incurred cost for medical treatment, the insured might tend to overstrain medical services (Lauterbach, 2010, p. 130). Finally, Hilgers (2011) mentions the ownership structure as a reason for limited contestability. The German hospital market is traditionally characterized by a high portion of public and charitable ownership (Goepfert & Conrad, 2013, pp. 37-45). It is self-explanatory that for those hospitals, profit maximization and the aim for efficiency enhancement are not of primary importance, as it would be in other commercial enterprises. The assumptions behind economic market theory can therefore be applied only limitedly for the hospital sector (Hilgers, 2011, p. 11).

Summing up, there are considerable information deficits, market entry barriers and a high-level of governmental regulation in the hospital environment. The unrestricted movement toward competition would cause uncomfortable effects and thus cannot
become reality in this different market (Schlüchtermann, 2013). Nevertheless, over the last two decades health care policy brought new challenges for the sector that affected hospitals in a way, which required more competitiveness regarding their structure, organization as well as their financing (Ziehe, 2009, p. 11). A central responsibility hereby can be drawn to the compensation system, which was renewed by the introduction of the German Diagnosis Related Groups (G-DRGs) in the years after the millennium (chapter 2.3). But also the integration of the post-discharge treatments, the outpatient surgery, and increasing competition in terms of price and quality were decisive for this development. Before breaking down the financing structure and the individual economic factors of influence in the hospital segment, it is necessary to differentiate between the different ownership types of hospitals, which is done in chapter 2.2.

2.1.2 Structure by Hospital Ownership

German hospitals can be differentiated according to several criteria. They can be categorized by ownership, measures of size such as number of beds, different levels of care, and as hospitals with or without an apprentice function. The following section focuses on the distinction based on ownership because operations and decisions made by hospital personnel and overall strategic directions are considerably determined by the type of sponsor (Hilgers, 2011, p. 12). Furthermore, there has also been an apparent shift within the ownership structure, which is not least associated with the increase in competition in the sector – driven by the structural underfunding of many hospitals. According to § 2 para. 1 KHG and § 107 para. 1 SGB V, the operation of hospitals requires a multitude of requirements that bring along financial obligations. The sponsor of a hospital is the party who is responsible for those financial obligations (Quaas & Zuck, 2008, § 24, Rn. 61). It owns the qualified majority of capital stock and voting rights. Consequently, the sponsor operates and administers the hospital. The ownership structure of German hospitals has evolved historically and can be sub-divided into three different sponsorships: Public ownership, independent charitable ownership ("freigemeinnützige Inhaberschaft"), and private ownership. This tripartite is legally protected by § 1 para. 2 of the Hospital Financing Act, although this does not guarantee a stable market sharing between those groups.
The first group is composed of publicly owned hospitals. They are owned by regional bodies such as the federal government, Federal States, precincts, districts, and communities. Moreover, publicly owned hospitals comprise associations of those regional bodies, public-law institutions or social insurance carrier. Their primary goal is not to generate commercial profit. Instead, they just have to ensure to cover all operating expenditures (Busse & Riesberg, 2005, p. 120). The principal function of publicly owned hospitals is rather based on the idea according to the Basic Law for the Federal Republic of Germany ("Grundgesetz der Bundesrepublik Deutschland") to guarantee public medical services to everyone. Therefore, publicly owned hospitals are obliged to cover the collective demand of all primary health care.

Independent charitable hospitals build the second category, consisting of hospitals, which are religious, charitable or diaconal associations. About two out of three German independent charitable hospitals are church operated (Schlüchtermann, 2013). However, there are also non-confessional sponsors such as the German Red Cross, Workers' Welfare Associations and other private welfare organizations. Although they might be private from a legal perspective due to private property rights, they are classified as non-private because of different goal orientation and organizational structure. Generally, the capital of independent charitable hospitals is designated for a specific purpose and their operations are oriented toward voluntariness and non-profit-making. Already per definition according to § 52 of the German revenue code ("Abgabenordung – AO"), corporations are allowed to call themselves charitable, only if their activities are aimed to benefit the general interests in a material, intellectual or ethical way, free from any selfish motive. Consequently, independent charitable hospitals are not allowed to use funds for purposes that stand in contrast to their statutory objective.

Thirdly, there are private hospitals, operating as commercial enterprises. The sponsorship of private hospitals is in the hand of a natural person or a legal entity under private law. In contrast to the other two types of sponsorships, who primarily serve as non-commercial and demand-based supplier of health care, privately owned hospitals exclusively pursue economic goals. Due to this reason, they need a concession correspondent to § 30 of the German Trade Regulation Act ("Gewerbeordnung").
2.2 Historical Background of Hospital Financing

The present system of hospital financing is a complex mixture of governmental regulation and elements of market competition. As already described in chapter 2.1.1, the intervention by the government in the hospital sector is indispensable. Finding the right balance between competition and regulation under public law leads to many contradictions, making it difficult to create stable and suitable framework conditions. This is usually complicated by the fact that legal regulations always have been a compromise of long lasting disputes between central government and the Federal States (Behrends, 2013, p. 2). Today's legal framework of hospital financing devolved stepwise over time. They are a result of several legislative initiatives. Therefore, in order to understand issues in the current system of hospital financing it is useful to appreciate the context of the most important regulatory steps up to today.

The history of German hospital financing can be divided into three main periods: The period of liberal hospital financing until 1936, the time of a monistic system between 1936 and 1972, and the phase after 1972, which is characterized by the dual-financing model. Figure 2 illustrates those three different systems with their respective reimbursement models.

Figure 2: Different Periods of Hospital Financing

2.2.1 Liberal Hospital Financing until 1936

Until 1936 the health care sector was largely unregulated. At that time, there was an entire contractual freedom between patients, physicians, and health insurers – the three
parties described in section 2.1. Prices could be set autonomously, there was no obligation to conclude a contract, and also no central hospital planning (Sievert, 2011, p. 41). In this liberal system, all responsibilities for funding and deciding on investment activities and operating expenses of hospitals lied solely in the hand of the medical care provider itself (Arnold & Schellschmidt, 2003, pp. 85-86). Apart from subventions of municipalities, churches and foundations, the medical care providers' investment activities as well as their operating and capital costs were to be covered entirely by the hospital and nursing charges. In the years before 1936, the state began to intervene into the health care system step by step. This change was initiated by a doctors' strike that resulted in an abolition of the possibility to negotiate contracts on an individual basis, just between physicians and health insurers. Instead, a system of Associations of Statutory Health Insurance Physicians ("Kassenärztliche Vereinigungen") was created. From then on, health insurers were forced to conclude their contracts with these associations (Fleßa, 2013, p. 127). This meant an increasing influence of the legislator in the entire health care sector. Among other things, this led to a situation where the cancellation of hospital provision contracts became prohibited. Furthermore, health insurers were no longer allowed to offer health care services or to employ physicians (Fleßa, 2013, p. 133). The period of liberal hospital financing finally ended in November 1936 with the legal prohibition to raise prices ("Preisstopverordnung"). This was literally the first intervention by the government on prices in the health care market (Schlüchtermann, 2013).

2.2.2 Monistic Hospital Financing from 1936 until 1972

The post-war period until 1972 was characterized by an increasing number of legal regulations. Even though the government temporarily allowed free prices and went back to freedom of contracts between hospitals and health insurers, it had to reverse this step shortly afterwards. Main reasons for that reversal were the vehement protests of the social insurance carrier, who felt themselves heavily financially threatened by the deregulation (Fleßa, 2013, p. 134). Subsequently, several hospital and nursing charges were introduced. Thereby, prices became fixed and the law prescribed standardized guidelines for calculations. Over the following years, the government came up with further price specifications. On the one hand, this allowed the government to limit their budgetary expenditures. On the other hand, the prices at the statutory level were not high enough to cover the hospitals operational expenses and costs for investments
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(Tuschen & Trefz, 2004, p. 14). Therefore, many necessary investments in further development of hospitals could not be financed. Expenses for maintenance buildings and equipment had to be reduced to a minimum and the technological progress came to a standstill. As a result, a large number of German hospitals became seriously obsolete. More than one out of three hospitals had already been older than 50 years (Deu. BT-Drucks. V/4230, 1969). Hospitals called for governmental support and an adjustment of hospital and nursing charges to a level that could cover their costs. At the same time, the government launched a nationwide study in order to quantify the funding deficit in the hospital sector. The result – summarized in the so-called report "Krankenhaus-Enquete-Bericht" – was presented to the German Federal Parliament in May 1969. Based on that data, the Federal Government estimated the deficits of the entire German hospital sector to amount 980 million Deutsche Mark (Behrends, 2013, p. 3). The report demonstrated that public financial assistance for the construction of hospitals would have to be scheduled bindingly in order to strive for a long-term reorganization of the market (Deutscher Bundestag, 1969). Insurance holders and health insurers should not be any longer the only ones to finance the hospitals. From then on, the political majority argued in favor for public support, considering the issues in the hospital sector as a public responsibility. Behrends (2013) explains this process with the upcoming awareness of the idea of hospital care being services of general interest.

2.2.3 Dual Hospital Financing from 1972

Introduction and Consequences of the Hospital Financing Act

Out of this movement, a milestone in the history of hospital financing was set on July 29, 1972, when the Hospital Financing Act was introduced. This was the start of the era of dual hospital financing. With this statute, a statutory responsibility of the Federal States was created, in order to guarantee sufficient hospital capacity in each state (the service guarantee, "Sicherstellungsauftrag") (Costa-Font & Greer, 2012, p. 195). It was hoped that this so-called work of the century ("Jahrhundertwerk") would finally solve the financial problems in the system (Sievert, 2011, p. 43). As shown in figure 3 the Hospital Financing Act involved a clear distinction between operating expenditures and investment costs.
From now on, operating costs for medical treatment and daily operations had to be covered by the hospital and nursing charges, funded by the contributors of private and statutory health insurances. Hospital investment on the other hand turned to become the responsibility of the public authorities. The public authorities became responsible to finance investment costs for hospital buildings, beds, and medical equipment (Wolke, 2010, p. 4). The general assumption at that time was that it would be impossible to have a modern and efficient health care system without public contribution. For the public funding of investments the scheme of the Hospital Financing Act implied a hybrid financing ("Mischfinanzierung"). The Federal States were supposed to provide one third of investments. The remaining two thirds became the obligation of the Federal Government. The responsibility for implementing the Hospital Financing Act was delegated to the Federal States. For that reason every Federal State established individual state hospital laws. In accordance with § 6 para. 1 KHG of 1972 a central task of the Federal States is the development of an annual hospital plan that ensures necessary health care of inpatients. This plan determines hospital capacities and the amount of fresh capital that is to be publicly funded. Public funds are only being granted to those hospitals, which are considered in the hospital plan (Laschober et al., 1995, p. 76). However, the inclusion of a hospital in a hospital plan has the consequence of an obligation to contract between the hospital and the health insurances (Labisch & Spree, 2001, p. 18). Since hospital planning is still relevant today, a more detailed
explanation on the hospital plan will be given in chapter 2.3.6 when the current hospital financing system is outlined.

As already mentioned in chapter 1, all these innovations were based on the purpose of § 1 KHG, which expresses the aim to assure hospitals financial stability to enable a need-based medical care ("bedarfsgerechte Versorgung") of the population with hospitals that are able to operate effective, economically independent and at socially affordable hospital and nursing charges (compare § 1 KHG of 1972). The second key element of the Hospital Financing Act is the principle of cost coverage ("Selbstkosten-deckungsprinzip"), set out in § 4 KHG. According to that provision, the sum of financial resources from public sponsorship and the income from hospital and nursing charges should be sufficient to cover all original costs of a hospital that operates efficient and parsimonious (compare § 4 KHG of 1972). For the purpose of the implementation of the Hospital Financing Act, the Federal Regulation for Hospitals ("Bundespflegesatzverordnung") – in short BPflV – was launched on April 25, 1973. The BPflV was established to govern the reimbursement for inpatient and semi-inpatient hospital care through flat hospital and nursing charges ("vollpauschalierter Pflegesatz") based on original costs. It also provides a definition of original costs: According to § 18 para. 3 BPflV 1973, original costs are such costs, which are related to inpatient and semi-inpatient hospital care under a cost-efficient business management taking into account the operating efficiency of the hospital. Although the law prescribed no special form of flat hospital and nursing charges, only per diem hospital and nursing charges ("tagesgleiche vollpauschalierte Pflegesätze") became relevant in practice (Behrends, 2013, p. 4). The principle of cost coverage was underpinned by a regulated profit and loss compensation system: If original costs in the hospital would deviate from predefined hospital and nursing charges, either the hospital or the statutory health insurer would have to refund the differential amount afterwards. Hence, every hospital that could only prove to work economically appropriate had the legal right to get all operating costs refunded. Schlüchtermann (2013) stresses that hospitals consequently did not bear any financial risk anymore.

The new regulations showed quick effects. In 1972, there was a considerable backlog of postponed investments in the hospital sector that needed to be caught up. Consequently, vast amounts of investment funds were called up soon and even increased over the
following years. According to Behrends (2013), within the decade between 1973 and 1984, the amount of investment funds provided by the Federal States rose from 3.2 billion Deutsche Mark to 4.5 billion Deutsche Mark. Meanwhile, also running costs increased dramatically in the outpatient as well as in the inpatient sector. Oftentimes, this development is defined as the cost explosion of the seventies. Sievert (2011) affiliates the increased costs to the integration of further groups of people in the statutory health insurance. Labisch and Spree (2001) however, also make the principle of cost coverage accountable for the cost explosion. They argue that the hospitals and nursing charges were fixed retrospective and therefore did not intensify hospitals to keep operating costs low. Schlüchtermann (2013) criticizes the role of per diem hospital and nursing charges as a dominating determinant for hospital reimbursement as a serious weak point. He states that in an economically well functioning pricing system for hospitals, the determinants for reimbursements should be in line with the determinants that cause the costs. The compensation through per diem hospital and nursing charges however, contradicts this idea. The artificial extension of the length of a patients' stay (LOS) – without medical necessity – would be even rewarded. Schlüchtermann (2013) who describes the economic thinking of hospital management at that time as underdeveloped holds that even those economic incentives that already existed, led in the wrong direction. It is, therefore, not surprising that the average length of time that patients stayed in German hospitals amounted 18 days – a worldwide peak figure. Furthermore, there was an expansion of health care services in general. Thus, instead of stabilizing the financial situation in the sector, these factors contributed to the increase of costs for the statutory health insurances by 144 % between 1970 and 1975 (Weyel & Mühlhauser, 2003, p. 6). On top of that, the oil crisis of the mid seventies reduced the income of statutory health insurers, caused by a high unemployment rate. The shrinking income paired with the simultaneous cost explosion put the health care system once again in serious trouble. To counter this, the average contribution rate for health insurance was increased from 8.2 % to almost 10 % in the years after the introduction of the Hospital Financing Act (Behrends, 2013, p. 4). Nonetheless, this could not compensate the ever-rising costs that statutory health insurances were confronted with. Tuschen and Trefz (2004) point out that the portion of costs for hospital services increased from 17.5 % in 1960 to 30.1 % in 1974, and finally accounted for 32.1 % of total costs for health insurances in 1984. This unequal
development of costs and resources resulted in a movement of cost containment policies. The main goal was to ensure stable health insurance contribution rates. Therefore, politicians tried to undertake several initiatives to reduce costs in the entire health care market. Considering the development in the following decades, one can summarize that the political attempt to balance increasing expenses and income in the health care sector failed to work out up to the present day.

The Hospital Reorganization Act of 1984

Following the period described above, several attempts by the Federal Government to limit the cost development in the health care market failed. The first endeavor to modify misdirected incentives in the Hospital Financing Act was made in 1977. With the Hospital Insurance Cost Containment Law ("Krankenversicherungs-Kostendämpfungs-gesetz") the German Federal Government tried to transfer more responsibility for hospital planning to health insurances and the hospital sponsor's state associations ("Landesverbände"). After the failure of this attempt due to resistance form the Federal States, also further initiatives in 1978 and 1981 could not gain enough acceptance to assert themselves (Tuschen & Trefz, 2004, p. 21). Finally, it was only the Hospital Reorganization Act ("Krankenhaus-Neuordnungsgesetz") of December 20, 1984 to bring relevant changes. Although the basic principles of hospital financing were maintained, a major achievement of the amendment of the law was that hybrid financing was abolished. Public funding of investments became the sole responsibility of the Federal States. Furthermore, the new version of the BPflV of August 21, 1985 created an option of individual negotiations between hospitals and health insurances about hospital and nursing charges de facto replaced the system of profit and loss compensation and therefore at least weakened the criticized principle of cost coverage. From the introduction of the BPflV up to that date, hospital and nursing charges were governmentally fixed. Hospitals reported their costs to the health insurers only ex-post. Generally, those costs were fully refunded on this basis. According to Quaas and Zuck (2008), in case of disagreement, the opinion of a neutral arbitration board with a balanced composition of both parties was considered. After it had often been argued that this policy failed to encourage hospitals to strive for cost-effective management, now, only pre-calculated hospital and nursing charges of parsimoniously and efficiently operating hospitals should be refunded. Therefore, the Hospital Reorganization Act brought a changeover from retrospective to prospective hospital and nursing charges
(Schroeder, Kalass, & Greef, 2011, p. 110). With this step, the strict principle of cost coverage was transformed to a modified principle of cost coverage. Through this, every hospital was given the opportunity to realize profits – but also possible losses. As this system of flexible budgeting is at partially still relevant for hospital funding today, it is worthwhile taking a look at an illustrative example, shown in figure 4.

**Figure 4: Flexible Budgeting**

In the context of flexible budgeting, hospitals and health insurers had to negotiate a hospital's budget for a future period. In this example, hospitals and health insurers agreed on a budget of 1,000 monetary units to cover the expenses for 100 inpatient days. During the period, hospitals were paid through hospital and nursing charges for every inpatient day corresponding to the negotiated conditions. As shown by the light blue line a hospital would invoice the division of planned budget (1,000) divided by the number planned inpatient days (100) for every inpatient day during the year, which is 10. Hence, the settlement of these hospital and nursing charges had the character of an installment, which was count against the planned budget. However, in reality, it is quite unlikely that the planned target figures will be met exactly. Therefore, excess or shortfalls of revenue was compensated with 75 % of its actual amount. This method should ensure that hospitals could at least cover their fixed costs, when deviating from plan (Behrends, 2013, p. 5). Accordingly, the ultimate reimbursement – displayed by the budget line – was calculated using the following formula:
The horizontal axis in figure 4 displays three different scenarios showing the cases of 50, 100, and 120 inpatient days. In the event that the hospital generates exactly 100 inpatient days – just as planned – nothing has to be done at the end of the period. If the hospital has billed less, for example 50 days, it had only received 500 monetary units during the year. This would not be a problem for a hospital that operates only with variable costs. Since fixed costs, however, are quite high in the hospital sector, the regulation requires the health insurer to refund the underperforming hospital a positive compensation ("Ausgleichszahlung") of another 375 monetary units at the end of the period. This compensation equals 75% of the 500 monetary units, which are missing to get to the budget of 1,000. If the hospital has generated more inpatient days than 100, for example 120, it had received more hospital and nursing charges than it was entitled to. Therefore, it would have an obligation of 75% of the amount that exceeded the budget of 1,000, which would be 150 in this case. After a year with deviating figures, the regulation also prescribed to adjust the plan for the future (Tuschen & Trefz, 2004, p. 373). Excluded from this compensation scheme were procedural rates ("Sonder-entgelte"), which hospitals now could apply to reimburse its expenses for extraordinary expensive services – independent of its budget. For this purpose, the BPfLIV provided a benefits catalogue. With the introduction of procedural rates, the legislator intended to improve transparency of the cost structure of hospitals. Schlüchtermann (2013) argues that this step was made to prepare hospitals for further reforms.

Tuschen and Trefz (2004) emphasize that these regulations were enacted to make the compensation system become more profit-oriented by providing the hospitals financial framework conditions ex-ante. Schlüchtermann (2013) asserts that the methodology of flexible budgeting of the BPfLIV of 1985 is economically absolutely plausible and generally useful for several compensation systems. Through this, hospitals that had a higher bed occupancy rate than scheduled in the plan only got compensated for their additional variable costs. Before 1985, they would have still received full hospital and nursing charges, even though their fixed costs were already covered. Reversely, hospitals that could not meet their targets were ensured at least to receive coverage for their fixed costs.
The incentives described above, however, could not deliver the expected results, so that health insurances had been thrown into a deep crisis. Most authors of this subject blame two reasons for the failure of flexible budgeting. First, Tuschen and Quaas (1998) for example criticize that even after 1985 the hospital plan had remained a central element to acquire funding of operating expenditures. Schlüchtermann (2013) stresses that almost every hospital had been able to negotiate a budget based on the high level of inpatient days of the years before 1985. Although the opportunities for revenues above the budget were reduced through the flexible budgeting, there was still no incentive to have less inpatient days and accompanied costs than budgeted. According to Busse, Schreyögg, and Stargardt (2013) even the health insurances had an interest that hospitals delivered results that were congruent with the planned budget. In this context the often cited concept of precision landing was coined. The second reason for the inefficiency of flexible budgeting becomes apparent when taking a closer look at the formula above: The only relevant factor for hospital reimbursements is the number of inpatient days. Nevertheless, according to Schlüchtermann (2013), operating costs of a hospital are rather driven by the type of disease and the intensity of care than the period of hospitalization. Those cost drivers, however, were not addressed by the flexible budgeting. At least the procedural rates could fulfill their function to increase cost transparency – but also not regarding the reduction of costs. In contrast to hospital and nursing charges, procedural rates were fixed. Hospitals could therefore strive to gain attractive profits through a specific expansion of those volumes. In summary, the economic incentives at that time were not appropriate to compensate the increase of costs in the sector.

Health Care Structure Act 1993
Contrary to expectations the adverse movement of costs could not be stopped. For the reasons explained above, in literature, oftentimes the insufficient efficiency of regulations is made responsible for the budgetary problems of the health insurers. According to Kühn (1995) that is only half the truth. He also ascribes responsibility to macroeconomic factors for the chronically underfunding of German health insurers. Their income from contributions developed less, relative to the gross national product (GNP) mainly because of the increasing unemployment and under-proportional rates of salary increase. Furthermore, Paffrath and Reiners (1987) even claim that funds of health insurances have been deprived several times through political interventions for
the purpose of the federal government budget or other social security purposes. In the early 1990s, however, expenses of German health insurances recorded double-digit annual growth rates (Behrends, 2013, p. 7). According to Weyel and Mühlhauser (2003) the regulations of the Hospital Reorganization Act have been mainly to the burden of the insurance holders of statutory health insurance. Since these regulations reduced financial scope between hospitals and health insurances, the insurance holders were the ones to cover the costs – which were still increasing – through higher insurance contribution rates. Simon (1997) holds that out of all regulations since 1972 in the name of the so-called costs explosion, those of the 1990s have been most decisive for the change in the hospital sector. This is not only due to the fact that the introduction of the Health Care Structure Act ("Gesundheitsstrukturgesetz") in 1993 had a more comprehensive manner for the hospital financing system, but also accompanied several changes in the hospital environment.

The Health Care Structure Act, which entered into force in 1993, included a comprehensive part concerned with the hospital sector. These regulations were introduced with the goal to further sharpen the existing incentives of hospitals to reduce their costs. Moreover, it was aimed to better differentiate charges for hospital treatment according to their actual costs. Gerlinger (2012a) argues that the legislator believed that these prerequisites were crucial to strengthen the competition between hospitals and to increase the transparency of hospital performance. For this purpose, Behrends (2013) describes the Health Care Structure Act as a paradigm change toward competition. Its regulations comprised three main elements: A cap of the hospital budget growth rate for the years 1993, 1994, and 1995, the permission for hospitals to also provide pre- and post-inpatient services, as well as ambulatory surgery, and a new reimbursement model (Simon, 1997, p. 8). First, in order to prevent further cost increases for the health insurances, the Health Care Structure Act prescribed a sudden brake ("Sofortbremsung") of expenditures through a cap regulated by law (Behrends, 2013, p. 9). This meant that in 1993, 1994, and 1995, the growth rate of several costs for health care services must not exceed the growth rate of insurance contribution rates. Those caps were redefined by legislation several times over the following years (Simon, 1996, p. 23). Due to a series of initial exception provisions the cap unfolded its effects only in the subsequent years (Simon, 1997, p. 10). The second relevant change for hospitals concerned their permission of new types of treatment. Since January 1, 1993 hospitals
are allowed to provide pre- and post-inpatient surgery as well as ambulatory surgery. A strict separation of inpatient and ambulatory treatment was thus eased, which reduced the number of fully inpatient stays. Much more of importance within the Health Care Structure Act, however, was the preparation of a fundamental structure of a new hospital reimbursement system. The obligatory introduction for all German hospitals took place in January 1, 1996, based on the reformulated Federal Regulation for Hospitals 1995.

Federal Regulation for Hospitals (BPflV) 1995

Gerlinger (2012a) summarizes the four most important innovations of the Federal Regulation for Hospitals. First, and most groundbreaking, countrywide case rates ("Fallpauschalen") were implemented as an instrument for general hospital compensation in accordance with § 11 para. 1 BPflV 1995. This was a supplement to the already existing per diem hospital and nursing charges. At the beginning, the height of the rates was prescribed by the Federal Ministry of Health. At a later date they were negotiated between the Association of Private Health Insurances, the Association of Statutory Health Insurance Funds, and the German Hospital Federation (Gerlinger, 2012a). Secondly, surgical operations and diagnostic measures that bring along several subsequent treatments were summarized in a complex of services ("Leistungskomplex") and compensated with procedural rates. The regulation intended to refund such complex of services in accordance with its actual expense. Thirdly, department-specific hospital and nursing charges were launched, as stipulated in § 13 para. 3 BPflV 1995. They allowed differentiating between different levels of care and hospital departments and to compensate additional costs for stays that were longer than envisaged. Fourthly, to refund all non-medical and non long-term care expenses, a base hospital and nursing charge ("Basispflegesatz") was adopted. This charge was equal for all departments of a hospital and designed to remunerate administration, accommodation, laundry, hospital catering or general patient services (Simon, 1997, p. 14). Except the fact that both charges were invoiced based on inpatient days, the base hospital and nursing charge had nothing to do with the per diem hospital and nursing charges of the period before 1996, which were paid to refund all operating expenses. Base hospital and nursing charges and department-specific hospital and nursing charges were calculated on the basis of hospital specific costs. Procedural rates and case rates on the other hand were externally imposed by an agreement between the German Federal Ministry of Health.
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("Bundesgesundheitsministerium") (Gerlinger, 2012a). In this way the Health Care Structure Act had created a hospital financing system, which was a complex mixture of per diem based rates and fixed case rates, as shown in figure 5 (Simon, 1997, p. 14).

**Figure 5: New Hospital Reimbursement Model (BPflV 1995)**

With this regulation the legislator intended to do the first step toward a system that entirely financed its operating costs through fixed rates, independent of the period of hospitalization: The diagnosis-related groups system (DRG-System) ("Fallpauschalen-system") (Simon, 2000, p. 1). During the initial period, however, three quarters of costs were still compensated with per diem hospital and nursing charges, even so their height was now more oriented to their actual costs (Gerlinger, 2012a). Therefore, the incentives for hospitals to reduce their corresponding costs and periods of hospitalization had not yet increased much. Only the remaining quarter of costs for inpatient treatment was financed by case rates and procedural rates. Regarding these treatments, hospitals were stimulated to keep their costs low and reduce LOS. As a protection for patients from the risk that hospitals could discharge them too early, a pre-defined maximum length of stay ("Grenzverweildauer") was introduced for most of the diagnoses paid by case rates. Thereby, hospitals, which kept their patients longer, had the right to demand hospital and nursing charges in addition to the case rate. On the one hand, this reduced the hospitals' risk to bear alone for additional expenses of
exceptionally complex cases. On the other hand, hospitals were not guaranteed any cost coverage through this (Gerlinger, 2012a). The end of this period constituted a radical change toward a hospital financing system that is based entirely on case rates.

2.3 The German DRG-System

2.3.1 Origination of DRGs

The concept of diagnosis-related groups was originated in the 1970s at Yale-University in the United States of America (USA). It is a system to classify hospital cases into groups in order to categorize the treatment a patient receives. Thereby, also different degrees of severity of treatment and secondary diagnoses are considered. Compared to today's DRG configurations, the first application in the United States – the DRG HCFA-DRG – was relatively simple. It was introduced with only 493 different DRGs mandatory in 1983 for members of the Medicare Insurance, which were older than 65 years of age. Covaleski, Dirschmit, and Michelman (1993) emphasize that from then on also European countries generated interest in patient classification systems (PCSs) for their hospital financing. While countries like France, Belgium, Finland, Sweden, Norway, and Portugal work and develop DRG systems since the early part, Austria and Germany started to carry out research for their DRG-Systems in the 1980s (Rocheil & Roeder, 2001, p. 61). In the version of AR-DRG, Australia was the first country to introduce DRGs nationwide in 1999 (Fischer, 2001, p. 13). Just a year thereafter, the German self-government decided to implement an independent reimbursement system based on the Australian example. Fritze (2001) explains the attractiveness of the Australian AR-DRG at that time especially with the advanced methodological approach, the current state of grouping of cases, and a good adaptability for Germany. The system changeover was initiated by the Health Reform Act 2000 ("GKV-Gesundheitsreformgesetz 2000").

2.3.2 Motives for Implementing DRGs in Germany

With the introduction of the DRG-System the paradigm shift described in chapter 2.2.3 was further carried forward. This change of course should make the new system of hospital financing have a comprehensive pricing system, less public responsibility, and more competition (Behrends, 2013, p. 11). Considering the development of the past decades of German hospital financing and first results of foreign countries that already applied a DRG-System, the German decision to follow seems just a logical conclusion.
Forgione and D'Annunzio (1999) for example had published a study that compared 29 Organization for Economic Co-operation and Development (OECD) countries regarding the development of their hospital sector specific key figures. Their research revealed the average length of a patient's hospital stay for inpatient acute treatment was significantly shorter in those 10 counties, which were using DRG-Systems compared to those 19 that were not. Although there was a long-term trend since the 1980s of decreasing LOS in both groups, the absolute difference between then had stayed the same. Rocheil and Roeder (2001) hold that other studies of the 10 affected countries had shown similar results. According to them, the introduction of a DRG-System for the reimbursement of hospital services led not only to significantly shorter LOS, but also to a higher productivity of hospitals. This means that more cases were carried out, while costs per cases decreased, and costs per day of treatment increased (Rocheil & Roeder, 2001, p. 61).

There have been several concrete political motives for an implementation of a DRG-System in Germany. However, five reasons are mentioned most often in literature: Performance orientation, transparency, altered pattern of resource allocation, shorter LOS, and the promotion of a structural change. Most obviously, the DRG-System allowed the introduction of a strict performance-oriented reimbursement for hospital services according to the principle "money follows performance" (Hoppe, 2002, p. 97). Hence, the budgets should be provided to those hospitals that possess the highest number and the most severe of cases. At the same time, it was the aim to create a transparency of performance and costs. Capabilities of hospitals were supposed to become visible. Cross-subsidizations should be avoided. While these objectives are fairly straightforward and not overly prone to controversy, Schlüchtermann (2013) states that there were more objectives which have been and still are subject to disputes. He claims that it was the intention of the legislator to modify the allocation of resources in several respects. On the one hand, the DRG-System sets clear incentives for hospitals to specify (Behrends, 2013, p. 11). Hospitals that get compensated with fixed rates will most probably make either a profit or a loss with every conducted case – depending on its costs. Assuming that a higher degree of specialization leads to lower average costs, hospitals might need to identify the areas in which they operate profitable due to low costs. Therefore, the DRG-System forces hospitals to break down their costs internally to find out about their economic strength and weaknesses in order to specify. The
second factor the DRG-System is used for is to commute the allocation of resources concerning the allocation between outpatient and inpatient treatment. Simultaneously with the DRG-System, a special catalogue for outpatient and inpatient treatment was created. In this way, cases that are treated mistakenly inpatient could be easily identified and thus be avoided. By and large, the changeover can be attributed to economic motives (Ahrens, Böcking, & Kirch, 2005, p. 26). Unlike in the time before the per diem hospital and nursing charges, where long hospital stays were rewarded, the new system put massive pressure on hospitals to reduce the length of hospital stays. A more detailed explanation on incentives set through the DRG-System is provided in chapter 2.3.5, after having outlined the specific factors of the new reimbursement system. Summing up, the German government hoped to predicate a cutback of overcapacities – just like in the other DRG-using countries. Not least, this should finally contribute to a long-term stabilization of the health insurances' expenses (Behrends, 2013, p. 11).

2.3.3 DRG-based Reimbursement

Basic Reimbursement Concept

The DRG-System is based on the premise that every inpatient treatment is assigned to a case group – the DRG (Schwintowski, 2006, p. 161). Hence, patients are classified into groups having the same condition, complexity, and needs. The conditions are based on main and secondary diagnosis, procedures, and patient specific factors (age, gender, LOS, type of admission to hospital, type of discharge from hospital). All those information have to be coded electronically before they get transformed into DRGs by a mathematical algorithm. However, Schlüchtermann (2013) holds that one might expect every DRG to have its own price, but this is not the case. He emphasizes that there is an enormous technically advantage by first calculating points instead of directly using prices. A two-step procedure regulates the price setting within the DRG-System (Blum, 2012, p. 166). Accordingly, the reimbursement logic is based on a simple formula:

$$ R_i = CW_i \times BR_i $$

The remuneration for a patient's treatment of a case group $i$ is the result of the multiplication of the two factors $CW$ (cost weight) and $BR$ (base rate). As a first step, all DRGs have to be assigned to a relative cost weight, also known as value relation ("Bewertungsrelation"). Cost weights indicate how high the average costs of a specific case group $i$ are in relation to other DRGs. These cost weights are calculated in such a
way that the nationwide costs per case has an average of one. A cost weight of one therefore corresponds to a case with average costs that are as high as the average normalized costs of all German DRGs. To put it simply, cases with cost weights higher than one are more expensive than average cases. Conversely, cases with cost weights below one involve costs below average. For example, a tumor endoprosthesis on the femur causes costs, which are 6.5 times higher than an average case of hospital treatment (InEK, 2014, p. 44). Hence, the cost weight for a tumor endoprosthesis is 6.5. A simple arthroscopy on the other hand is almost half as costly as an average case. Consequently, its relative cost weight amounts 0.61 (InEK, 2014, p. 40). These cost weights apply nationwide. They are calculated annually on the basis of actual costs by the Institute for the Hospital Remuneration System ("Institut für das Entgeltsystem im Krankenhaus – InEK") – an institute, founded by the German Federal Associations of Health Insurance Funds ("Spitzenverbände der Krankenkassen"), the Private Health Insurance Association, and the DKG (Hilgers, 2011, p. 34). In order to get a solid and current database for the calculation of the cost weights, the InEK annually reviews about four million cases of inpatient treatment from about 200 voluntarily participating hospitals – the so-called calculation hospitals ("Kalkulationskrankenhäuser") (Bartsch, 2006, p. 66). Every year a comprehensive DRG catalogue ("Fallpauschalen-Katalog") is published by the InEK including all current figures related to DRG remuneration and supplemental payments. The sum of the cost weights of all cases, which a hospital generates over a year, is called case mix:

$$CM = \sum_{i=1}^{n} CW_i$$

Such being the case, the case mix offers indications of a hospital's total operating costs. According to that, the higher the case mix of hospitals with the same amount of annual cases, the more severe must have been the cases, which the hospital had conducted. In order to compare the severity of cases between hospitals of different size (different number of cases), the Case-Mix-Index (CMI) can be used. The CMI simply normalizes hospital size by dividing a hospital's cost weight by the amount of its cases (n):

$$CMI = \frac{\sum_{i=1}^{n} CW_i}{n}$$
This means that the Case-Mix-Index expresses the average economic severity of a hospital's cases. In relative terms, hospitals with Case-Mix-Indexes higher than one have to deal with more cost-intensive cases than the average and vice versa.

The monetary evaluation comes into play in the second step (Blum, 2012, pp. 166-167). In this process, the points collected by a hospital in terms of cost weights get priced. The price per cost weight is defined by the base rate, which is calculated annually by the InEK based on legal provisions. While base rates were calculated on an individual basis for every hospital in the early stage of the DRG-System, they have been unified over time. Multiplying the base rate by the cost weight finally generates the price of a DRG.

**Supplementary Payments**

For certain extraordinary expensive treatments or medicine, supplementary payments can be paid on top of the "standard" DRG (Scheller-Kreinsen, Quentin, & Busse, 2011, p. 3). This concerns for example the hemodialysis, blood products, or special implants, which are listed in the annual DRG catalogue in their type and height (InEK, 2014, pp. 125-127).

**Additions and Abatements**

As a rule, the DRG-System ensures hospitals a fixed compensation for inpatient treatment. Since this could intensify hospitals to discharge patients too early, the legislator linked the fixed compensation to the condition that the LOS in hospital has to range between a minimum and a maximum threshold as shown in figure 6.
A discharge of a patient below the minimum threshold results in abatements. Goedereis (2009) emphasizes that through this, the hospital gets sanctioned even though the main treatment typically had already been carried out at this point. Eiff, Meyer, Klemann, Greitemann, and Karoff (2007) on the other hand remark that too drastic reductions of LOS oftentimes result in the necessity for further treatment such as outpatient and inpatient rehabilitation or additional outpatient and inpatient care. The minimum threshold can therefore be seen as a protection for the patient as well as for health insurances. If the LOS, however, exceeds the maximum threshold, the hospital receives a day-based compensation. Because these additions cover at the utmost only additional variable costs, this compensation scheme follows the same logic as the principle of precision landing within the flexible budgeting described in chapter 2.2.3.

**Excess or Shortfalls of Revenues**

Schlüchtermann (2013) holds that the fixed remuneration through case rates also accompanies an incentive for hospitals to boost their revenues by increasing the number of cases. In order to prevent such an excessive increase the DRG-System provides budget limits. In a similar way that the compensation for single cases underlies abatements and additions, also on the level of the entire hospital there are regulated...
settlement amounts for excess or shortfalls of revenue (positive or negative compensation). According to § 4 para. 9 KHEntG ("Krankenhausfinanzierungsreformgesetz"), revenues above plan are compensated with 65 % and shortfalls of revenues are considered with 20 %. Since the reimbursement through DRGs is oftentimes subject to conflicts between hospitals and health insurances, the Medical Service of the Health Funds (MDK) is commissioned to undertake inspections as a neutral assessor.

2.3.4 The System Conversion

The Health Reform Act 2000 and the corresponding introduction of § 17b of the Hospital Financing Act initiated the system conversion. This legislation was associated with the instruction to the Federal Ministry of Health to develop and introduce a new, nationwide performance-oriented, reimbursement system which promotes efficiency, transparency, and quality in the hospital sector until January 1st, 2003 (Braun, Rau, & Tuschen, 2007, p. 3). The introduction of the German DRG-System stretched over seven years. The process of implementation can be divided into four phases explained in the following.

Preparation Phase

During the preparation phase from 2000 until 2002, the Australian A-DRG system was adapted to the German hospital environment in two steps. First, the German Institute for Medical Documentation and Information (DIMDI) converted the Australian procedure codes, which were based on international classifications of Diseases ICD-9-CM (clinical modification) of the World Health Organization (WHO) to German procedure classification codes ("Operationen- und Prozeduren schlüssel" – OPS). Accordingly, ICD-10-WHO diagnosis codes were transformed to a German version – the German modification ICD-10-GM (Busse, Geissler, Quentin, & Wiley, 2011, p. 248). In a second step, the self-governing bodies founded the InEK. As already mentioned above, the InEK was commissioned with the establishment and further development of a German-specific DRG-System (Behrends, 2013, p. 13). By the end of 2002, the InEK had established a cost accounting system that calculated relative cost weights. Out of approximately 1,800 acute hospitals that were affected by the DRG-System, 100 hospitals had voluntarily shared their cost data with the InEK. Based on this, the InEK calculated relative national cost weights and came up with the first version of a German
DRG-System (G-DRG) including 664 single DRGs in a *Case Fee Catalogue* (Busse et al., 2011, p. 248).

**Budget-neutral Phase**

The second phase is called the *budget-neutral phase*. It comprises the introduction of DRGs in the years 2003 and 2004. In 2003, all hospitals were given the option to group their patients using G-DRGs and national cost weights. Around 700 hospitals decided to use the DRG-System (Neubauer & Pfister, 2008, p. 163). The sickness funds already used the DRG information to negotiate DRG-based budgets for those hospitals. However, the total amount that a hospital received for 2003 had to be as high as previously. The DRGs itself were calculated according to individual costs of every hospital: To determine hospital specific base rates, in simple terms, the given hospital budget was divided by the volume of cost weights. Hence, the DRGs had no economic impact on hospitals in the first year (Plamper & Lünge, 2006, p. 158). But Neubauer and Pfister (2008) bring out that the differences between base rates of hospitals already showed which hospital would be winning or losing if base rates were harmonized. Since this revealed which hospitals operate with high base rates – meaning that their budgets had been relatively high for their patient case mix – hospital efficiency became visible for the first time in German hospital history (Busse et al., 2011, p. 249).

As a result, many hospitals lobbied for adjustments in grouping and costing. Subsequently, a revised version of G-DRG with about 100 new defined and calculated DRGs and the supplementary payments, described in 2.3.3, was prepared in 2003. Furthermore, quite a number of university hospitals agreed to participate in DRG cost calculations. These information were shared with the InEK, which calculated absolute average costs for old and new DRGs in order to determine relative cost weights. In 2004, all 1,500 hospitals that were included in a hospital plan committed to negotiate DRG budgets with the health insurances. Consequently, the actual base rates for the majority of German hospitals were available by the beginning of 2004 to be used to determine the rates for the convergence phase beginning in 2005. (Neubauer & Pfister, 2008, p. 163)
Convergence Phase

The state-wide negotiated base rates described above served as yard stick for the convergence phase. During this period – between 2005 and 2010 – the hospitals' individual base rates stepwise converged to these state-wide base rates ("Landesbasisfallwert") in each of the 16 Federal States as illustrated in figure 7. At the starting point, the range between hospitals' individual base rates was quite high, varying from around 1,000 Euros to 6,200 Euros (AOK-Bundesverband, 2012). The difference between hospital-specific base rates and the state-wide rates had to be reduced annually: In 2005, by 15 %, from 2006 to 2008 by 20 % each year, and in 2009 by the last 25 % in order to reach the state-wide prescribed level (Busse et al., 2011, p. 250).

Figure 7: Hospital Specific Base Rates and State-wide Base Rate

Source: Own illustration based on Busse et al. (2011)

Busse et al. (2011) point out that the G-DRG does not consider any organizational factors of a hospital. Nonetheless, hospital size, input prices or the teaching status of a hospital matter for the cost structure. Hence, hospitals, which operated at relatively high costs, were put under severe pressure adapting to the state-wide level. In order to gain sufficient political acceptance for the system change, possible losses were limited during the convergence phase. The light blue dotted lines in figure 7 show that in 2005 for example, losses of the negotiated budget were limited to one percent. Since the
possibility of losses remained restricted until 2009 (although it increased to 3 %), not all hospitals had achieved state-level by 2009. After the elimination of this loss protection in 2010, state-wide base rates finally were applied to all hospitals (Busse et al., 2011, p. 250). Thus, a new remuneration system was created that set completely new requirements and financial incentives for the market participants in order to overcome the financial problems of the last decades. Since this induced a politically intended structural market change, a more detailed description of those financial incentives applied on the G-DRG-System is given in the next chapter.

2.3.5 Central Incentive Effects Within the DRG-based System

In the following, the incentive effects caused by the system change are outlined. Thereby, no explicit differentiation between case rate and supplementary payments are made because their characteristics are very much in the same direction. The DRG-System successfully managed to eliminate the most crucial disincentives in system that was based on daily hospital and nursing charges. Schlüchtermann (2013) argues that the main advantage of case rates compared to per diem charges is the fact that hospitals have less influence on the amount of cases than on LSO. Since in the old system, hospitals gained all their revenues per diem through base hospital and nursing charges and department-specific hospital and nursing charges, their profit was determined by the difference between those charges and costs per day. Hilgers (2011) explains that daily costs per patient are generally the highest within the first days of treatment. According to her research based on data of the statutory health insurances, more than 70 % of surgeries were carried out at the day of admission or the following day. Figure 8 shows the relation between LOS and the financial remuneration for a treatment case for the old and the new compensation system. The difference between each point on one of the two blue remuneration lines and the red line displaying total costs of treatment is the profit margin. Because of the high initial costs, profits could only be gained if the patient stayed longer than the time marked by the break-even point. Only from that time, total reimbursement exceeded total costs. Thereafter, the hospital's profit margin was increasing with every additional inpatient day.
Knorr (1998) describes that a systematic abuse by hospitals extending the LSO of their patients was just a logical consequence. Although the incentive for such artificial extension of LOS was reduced through the flexible budgeting, only the DRG-System could finally prevent those practices. Another fundamental incentive problem in the system with per diem charges was the retrospective determination of budgets (Hilgers, 2011, pp. 39-40). The fact that calculations of hospital budgets were based on actual costs of previous years prevented any intention of hospitals to reduce their expenses. Any savings would have resulted in further limitations in the following years. Nevertheless, proponents of the old system often state that those regulations were protective against quality-sensitive savings, early discharges of patients or the incentive for the attraction of patients with a low severity of disease. From an economic perspective however, there is a large degree of consensus that the DRG-System abandoned misleading incentives that rewarded long LOS and inefficient processes (Paeger, 2013, p. 319).

In the new system, the financial incentives for hospitals are diametrically opposed. The hospital alone bears the financial risk for the treatment of the patient, by receiving a
case rate, which is fixed (apart from abatements and additions). Depending on whether total costs of treatment exceed or fall short of the compensation through the case rates, hospitals gain profits or realize losses. Figure 8 shows that only for a LOS below the break-even point of the new system, a hospital can get into the green shaded profitable area. If the LOS, however, is too short, the profit margin becomes negative again because the hospital gets punished with abatements. Therefore, in the DRG-System, hospitals have an incentive to discharge their patients at the lower bound of the horizontal line (standard LOS) to maximize their profit margin (Goedereis, 2009, p. 241).

2.3.6 Hospital Planning
The dual-financing goes along with the principle that Federal States are obliged to establish hospital plans according to § 6 KHG, as they are responsible for the supply of medical care to the population (Freytag, 2010, p. 200). The Federal States need to coordinate with each other in case that a hospital is in charge for the health care of more Federal States (Deutsche Krankenhausgesellschaft, 2014, p. 2). First and foremost, a hospital needs to be admitted to the planning if it wants to be entitled to reimbursement of investment costs. The planning itself contains among others the number of hospitals and beds. As each Federal State has additional regulations they differ from state to state, so that some focus only on policy frameworks for locations whereas others also include specific regulations on department structures and the number of beds (Gerlinger, 2012b). Hereby, the Social Security Act differentiates between two major types of hospitals, namely certified and other hospitals. Regarding the certified hospitals three specific types are considered. Firstly, statutory health insurances are only allowed to compensate hospital treatments of hospitals that have provision contracts – so-called district hospitals ("Plankrankenhäuser"). Secondly, university hospitals that are registered at a university index are automatically accredited by health insurances. Thirdly, hospitals that are not registered in the Federal State hospital plan still can enter into a contract with the National Association of Statutory Health Insurance Funds ("GKV-Spitzenverband") and Associations of the Substitute Funds and therefore be admitted for hospital care as contract hospitals (compare § 108 no. 3 SGB V). So-called other hospitals are not considered registered hospitals, but rather are small private hospitals that focus on self-pay patients (Blum, 2012, p. 160). Simon (2005) states that although the Federal States have to fulfill a service guarantee
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("Sicherstellungsauftrag"), namely the obligation to ensure the provision of sufficient and adequate inpatient care, they do not have to provide public hospitals themselves. They mostly delegate the duty to administrative districts and cities to build and maintain hospitals, or put other sponsors in charge. When those other sponsors withdraw from the market the Federal State is again in charge to cover the hospital provision. According to Statistisches Bundesamt (2012) the number of hospitals decreased by 1.4 % from 2011 to 2,017 in 2012. The total number of beds amounts to 501,000 and decreased compared to the hospitals themselves only slightly by 0.1 %. The bed occupancy rate increased from 77.3 % to 77.4 % in 2012. Furthermore, private hospitals are taking up an increasingly greater part in the market. While the share of private hospitals was 14.8 % in 1991, it amounts to 34.6 % in 2012 (Statistisches Bundesamt, 2012, p. 8). The fundament of the hospital planning is the analysis of demand and therefore the present and future need of hospital treatments. Usually, the Hill-Burton formula that has its origin in the United States is used to calculate the demand of inpatient care.

\[
\text{Needed Hospital Beds} = \frac{\text{Population} \times HC \times PoH \times 100}{\text{Use of Beds} \times 1,000 \times 365}
\]

Hereby, the formula uses Population, the Hospital Centralization (HC) (number of patients per thousand inhabitants), the Period of Hospitalization (PoH) and the Use of Beds (occupied beds per 100 beds) (Simon, 2005, pp. 201-202). According to Blum (2012) the Use of Beds or utilization rate is defined by every Federal State in the form of a normative full capacity ("Normauslastung") that varies between 75 and 90 %. Lately a development toward a morbidity and performance-based hospital planning evolved where diagnosis information are used (Blum, 2012, p. 160).

Having a hospital plan in place also a hospital analysis is necessary to assess the treatment conditions of existing hospitals. Based on that the hospital plan defines the number of hospitals as well as beds and specialty departments in each administration district or city. Thereby, each hospital will be assigned to a service level ("Versorgungsstufe"). As already mentioned the planning varies from Federal State to Federal State so that the number of service levels can differ. Neubauer (2007) shows that commonly the hospital care is very hierarchical and divided in three large service levels. Firstly, the regular and primary care ("Regel- und Grundversorgung"), secondly, the specialized care ("Schwerpunktersorgung"), and thirdly, the maximum care ("Maximalversorgung") (Neubauer, 2007, p. 64). Hospitals in the first service level only
need to take care of a basic care in the subject of internal medicine and general surgery. The second service level includes further specialist departments, like obstetrics and gynecology as well as ear, nose and throat departments, orthopedics, and ophthalmology. Hospitals of the third service level need to operate even more departments that complete supra-regional tasks, like neurology, facial surgery as well as oral and maxillofacial surgery. The last service level is often covered by university hospitals, as they are able to provide highly differentiated diagnosis and therapies for severe diseases and accidental injuries. (Simon, 2005, pp. 202-203)

Neubauer (2007) points out that the competition between hospitals in the different service levels is not very fair. This is because hospitals of a higher service range are allowed to offer treatments of the lower service level. Therefore, a hospital with the duty of a maximum care offers also primary care. As patients can choose where they want to be treated they do not consider the service levels. This undermines the system of hospital planning, as hospitals of the first service level are in danger to lose patients and therefore the needed capacity to break even. Also, hospitals that have to reduce their costs and increase their income chose the more convenient way increasing their offer, as decreasing costs is very hard in the short run. Those regular and primary care hospitals try to offer medical treatment of the next service level to achieve a higher number of patients (Neubauer, 2007, p. 64-65). On the other hand, Freytag (2010) claims that hospitals of the first service level also try to specialize and recommend patients with economically unattractive diseases to approach hospitals of higher service levels (Freytag, 2010, p. 201). All in all, the hospital planning is more and more losing its importance, as the hierarchical service levels are no longer credible.

2.4 Consequences of Recent Regulations and Current Problems

After decades of apparently hopeless reforms, trying to contain escalating costs in the inpatient sector, a structural change since the early 1990s caused an economization of the hospital environment. The Health Care Structure Act of 1993 and Federal Regulation for Hospitals of 1995 primarily accomplished this first step toward more competition and transparency. The G-DRG-System which was introduced stepwise as a self-learning system from 2000 onwards accelerated this development (Neubauer & Beivers, 2010, p. 3). With its differentiated configuration, the German DRG-System has set international standards for diagnose-based model systems and served as a role model
for Switzerland and China (Gürkan, 2009, p. 375). Economic effects on German hospitals caused by the system change showed up from the first years of its introduction. To a great extent in line with the initial political objectives described in chapter 2.3.2, the main measurable determinants of such effects can be summarized in five points: LOS, case figures, capacities, transparency, and competition. Nonetheless, when evaluating the development of those figures, one should keep in mind that they are driven by several factors. Hence, not all changes displayed in figure 9 are necessarily fully linked to the introduction of the DRG-System.

**Figure 9: Hospital Market Determinants**

![Illustration 1: Shrinking Capacities, Shorter LOS, More Cases](chart1)

![Illustration 2: Growing Number of Private Hospitals](chart2)

Source: Own research; (Statistisches Bundesamt, 2014a)

The political aim to reduce LOS, which was targeted since the Federal Regulation for Hospitals 1995 and the DRG-System through the incentives explained in the previous chapter, has been achieved. The red line in illustration 1 of figure 9 shows the relative decrease of average LOS since 2000. According to the Statistisches Bundesamt (2014a) already in the 1990s, hospitals started to reduce the length of stay: Starting from a high level of 11.5 days in 1995, the average length of stay in German hospitals decreased continuously to 9.7 days in 2000 and finally to 7.6 days in 2012. These figures show that hospitals obviously realized savings potentials through earlier discharge of patients. Thereby, it has to be considered that the DRG-System also enforced a shift of care from the inpatient to the outpatient sector. Over the last years, several less severe inpatient cases have been transferred to the outpatient sector. Accordingly, many cases with a
below-average LOS were no longer included in the LOS statistics (Braun et al., 2007, p. 7). The net effect of the DRG-System on a reduction of LOS has therefore been higher than shown by the actual figures. While hospitals are often criticized putting economic motives of LOS before the well being of a patient, hospitals refer to new operational techniques and new methods of post-operative mobilization as a reason for early discharges (Viering & Söhnle, 2010, p. 7). However, hospitals must not only balance between cost efficient LOS and sufficient quality of treatment. Shorter LOS also mean condensation of all treatment related operations within a shorter period of time. This leads to intensification of work and higher requirements for logistical and coordination needs (Rau, Roeder, & Hensen, 2009, p. 34).

Moreover, after converting to DRGs, the number of all cases carried out by hospitals increased by 13 % from 16.5 to 18.6 million between 2005 and 2012 as displayed by the dark blue line in illustration 1 of figure 9 (Statistisches Bundesamt, 2009). Several other international examples provide evidence for an increase in hospital admissions caused by DRG-Systems. Neubauer and Beivers (2010) view this as a clear sign of improved efficiency. The specific causes for the increase in case figures, however, are subject of permanent discussions. Hospitals on the one side attribute this matter to a considerable portion to the demographic change in Germany with an altered morbidity structure (Lux, Steinbach, Wasem, Weegen, & Walendzik, 2013, pp. 69-82). Health insurances on the other hand complain about rising expense burdens as a result of increasing case figures (Klein-Hitpaß, Scheller-Kreinsen, & Wolff, 2014, pp. 250-252). Busse and Schreyögg (2014) point out that even a comprehensive study on that issue disposed in 2012 by the black-yellow cabinet could not bring any further clarification.

Another trend that can be denoted concerns hospital capacities. While the amount of all beds in the hospital sector has been reduced since the mid 1990s, the DRG-Introduction has caused a decrease in the utilization ratio of beds (Braun et al., 2007, p. 8). According to the reduction of hospitals since 2000, hospital beds were reduced from 559,700 to 523,800 in 2005 and 501,500 in 2012 as shown by the light blue line in illustration 1 of figure 9 (Statistisches Bundesamt, 2014a). The green line, however, displays that in the same period, the utilization rate decreased from 81.9 % in 2000 to 75.6 % in 2005 and stabilized in the following years to a level of around 77.4 % as in 2012 (Statistisches Bundesamt, 2014a). Neubauer and Beivers (2010) hold that the bed
reduction has been made relatively slow, especially when considering the high initial level. The OECD points out that compared to other OECD countries Germany has traditionally one of the highest levels of hospital availability. In their 2013 position paper "Managing Hospital Volumes – Germany and Experiences From OECD Countries" they show that the German hospital sector provides 8.3 beds per 1,000 population while the OECD average ranges at 4.9 beds (Kumar & Schoenstein, 2013, p. 3). There are many causes for those overcapacities. Geissler, Wörz, and Busse (2010) for example blame the previously described hospital financing system from 1792 to the early 1990s. They also ascribe responsibility to the planning authority for hospitals of the Federal States that determine the supply of hospitals in their annual hospital plans (Geissler et al., 2010, p. 38). Neubauer and Beivers (2010) argue that the Federal States underestimated the effect of LOS reductions that were caused by the DRG-Introduction. Therefore, capacities have been created which now hospitals are not willing to reduce anymore (Neubauer & Beivers, 2010, p. 6). This situation is exacerbated by the diminishing investment financing of the Federal States, which also reduces the means to invest in structural adjustments of hospitals in order to realize better medical care processes, invest in new building or in the use of modern IT technologies. According to Neubauer (2003) hospitals are reluctant with regard to those changes because beds generally are assigned with personnel. The freeing of employees, however, is protected by labor legislation and therefore either only slowly to implement or costly. As a result, a large share of hospital costs is fixed costs. Hence, due to economic reasons, hospitals find themselves in an intensive competition for bed occupancies that contribute to their case mix (Neubauer & Beivers, 2010, p. 6).

The improvement of transparency has been a key consequence of the DRG-Introduction. Comprehensive data about the type and the number of hospital cases as well as cost structures are now available. The DRG-Institute publishes these information on its home page and through the Federal Statistical Office. From an economic perspective, the most important data among them are the so-called § 21 data about case-related treatments and hospital-related structural data which hospitals report annually to the DRG-Institute as well as case-related cost data provided voluntarily by the calculation hospitals for the determination of DRGs. Furthermore, the DRG-System has created a framework that is meant to ensure a need-based and more efficient allocation of resources. Through the stepwise implementation of state-wide base rates during the
convergence phase the hospital sector evolved closer toward a market in an economic sense. In order to close the gap between the base rates of each Federal State, the legislator prescribed the evaluation of a nation-wide base rate ("Bundesbasisfallwert") in § 10 para. 9 KHEntgG. Also, here, the adjustment is being carried out in annual steps toward a corridor of an upper and a lower limit since 2010 until 2014 ("Bundesbasisfallwert," 2014). Braun et al. (2007) describe these base rates as an important element of the market economization. As a result of the increased competition, mergers, acquisitions, and cooperation of hospitals characterized the sector within the last ten years (Eiff, 2011, p. 96). It seems that those steps are a worthwhile strategic option to ensure long-term economic and medical profit potential. Particularly noticeable is the increasing share of privately owned hospitals. Illustration 2 of figure 9 shows that the number of private hospitals increased by 43.4 % since 2000, whereas publicly owned hospitals and independent charitable hospitals diminished by 28.8 % and 21.2 %. The causes are manifold. Braun et al. (2007) argue that the abandonment of the principle of cost coverage with the Health Care Structure Act of 1993 (chapter 2.2.3) and the following limitation of resources induced strong competition between hospitals. This economic pressure was intensified by the DRG-System. Consequently, several publicly owned hospitals were not able to withstand those circumstances and therefore acquired by private competitors.

However, the newly created economization and the competitive pressure in the hospital sector could not lead to lower hospital expenditure growth rates for the statutory health insurances. Basically all introductions of DRG-Systems worldwide were politically intended and associated with the aim to reduce the expenses per case and to decrease the average LOS (Paeger, 2013, p. 319). Also, in all those countries, a system change to DRG-based remuneration finally led to performance orientation and transparency. However, Paeger (2013) claims that up to today nowhere in the world, an introduction of a DRG-System could fulfill the political expectation of a sustainable containment of costs. While between 2000 and 2005, the hospital expenditures of German statutory health insurances increased quite moderate by an annual compounded growth rate of 1.9 % from 44.16 to 48.53 billion Euros, the compounded annual growth rate between 2005 and 2013 amounted 3.56 %. Accordingly, costs for hospital treatments amounted 64.19 billion Euros in 2013 (GKV-Spitzenverband, 2014). Whether and to what extent this can be attributed to the new reimbursement system cannot be evaluated here.
Nonetheless, it has to be noted that the targeted expenditure reduction through the implementation of DRGs also could not be achieved in Germany.

**Status Quo**

The economic situation of German hospitals has deteriorated over the past years. The share of hospitals that are underfunded is increasing. Augurzky et al. (2014) analyzed more than 750 annual reports of hospitals as a basis for their publication "Krankenhaus Rating Report 2014". According to that, 35 % of German hospitals reported net losses at group level in 2012. With regard to the individual locations, the authors even estimate the portion of unprofitable hospitals to be 40 %. Thereby, hospitals in public and independent charitable ownership are affected more severe than private hospitals. While 28 % of public and 16 % of independent charitable hospitals show an increased risk of insolvency, only 3 % of private hospitals are endangered. The profitability, measured by the return on sales amounted only 1.1 %. Furthermore, already 44 % of hospitals are able to fund investment activities. Financial problems affect especially hospitals in Federal States with hospital structures that are characterized by a high number of small hospitals and a high density of hospitals without much specialization. Those attributes apply to Lower Saxony, Bremen, Hesse, and Baden-Wuerttemberg. According to the findings of the authors, a high specialization proved to be an advantage in an economic as well as in a qualitative way. Particularly striking is also the fact that university hospitals generally suffered even more than public hospitals. Moreover, *primary care providers* ("Grundversorger") in rural areas as well as large rural suppliers had greater funding problems than specialized rural hospitals. The same applies to urban areas, yet not to the same extent. (Augurzky et al., 2014, pp. 15-16)

The politically settled aid package for hospitals within the *law for health care contribution liabilities* ("Beitragsschuldengesetz") pledges hospitals among other benefits a legally granted care surcharge and proportional refinancing for union wages ("Hilfspaket für die Krankenhäuser verabschiedet," 2013). In addition, a relatively high rise of state-wide base rates as part of the previously described convergence are meant to provide at least temporary some breathing space. The funding problems of many hospitals, however, will not and are not intended to be solved by those regulations.
3. Methodology

The essential objective of the empirical analysis is to identify the most important causes for the underfunding of German hospitals and to generate ideas how those problems could be solved. Therefore, five interviews were conducted with experts at executive levels. The interview questions did not aim to get specific information about individual cases or hospitals. Instead, the interview partners were asked to make assessments for the hospital sector in general. Since the profitability of a specific hospital is influenced by a variety of factors such as ownership, size, hospital type, the surrounding region, the range of services offered, and so forth, case specific questions would have allowed neither a comparability between the different answers nor a conclusion for the market in general. Furthermore, in order to get a balanced perspective, it was important to interview experts of different interest groups. Therefore, two interviews were held with executives of privately owned hospitals. One interview was held with an executive of a public hospital and one with an executive of an independent charitable hospital. To get an opposite point of view, the fifth interview was conducted with an executive of a high-level association of German statutory health insurances.

Because the interview questions were intended to get a personal assessment of the experts, structured guideline-based interviews were carried out. This allowed making sure that individual aspects of the experts' view about the market were absorbed. According to Atteslander (2003) structured guideline-based interviews make it possible to identify potential relationships. Hence, this approach can be helpful in the issue at hand to detect solution approaches. Nonetheless, it is important to point out that expert interviews do not provide objective means of evidence (Brink, 2005, p. 135). The following chapter will therefore combine information and extracts from the different interview partners with additional research results.

The interview guideline starts with two open questions in order to get unbiased answers that are not influenced by any prior information. These questions are of a generic type. Here, the experts are asked about their opinion about the main causes for the underfunding of German hospitals and possible solution ideas. Following, eight rather detailed statements are given of which each statement has up to five questions. The statements cover the development of operating costs and costs for investments, public funding of investments, the reimbursement by case rates, market concentration and
privatization as well as bed occupancy, and competition between hospitals. The interview guideline was provided to the experts in advance. All questions address the experts' personal assessments of the hospital sector concerning the market situation rather than specific hospital internal affairs. For those reasons, the interviews differ to some extent in their contents, as the experts share their personal intentions, experiences, and beliefs.

To take different points of views on the market, four hospital executives as well as an executive employee of an umbrella association of statutory health insurances were chosen. Furthermore, two of the four hospitals are private ones, so that the market view can be extended. Although private hospitals generally do not suffer from underfunding the contribution of the experts is very valuable to understand the structures of the market, especially in the context of competition. All interviews are anonymized so that it is not possible to make inferences about names, employers or location. Following experts were interviewed:

- Hospital A: CFO of a private hospital group
- Hospital B: CEO of a private hospital
- Hospital C: CEO of a public hospital
- Hospital D: CFO of an independent charitable hospital
- Association A: Executive employee of an umbrella association of health insurances

4. Empirical Evaluation of Causes for the Underfunding of Hospitals

Having delineated how historical weaknesses of the hospital sector were approached through new regulations, the main direct effects of the DRG-Introduction have been outlined in chapter 2.4. Since an increasing large number of hospitals are suffering within the newly shaped sector, the following section will identify central causes for the crisis in order to help developing possible solution ideas.

4.1 Problems due to Demographic Structures and Medical Progress

While opinions on the reasons diverge in some aspects, it is obvious that hospitals have to deal with constantly increasing costs. The economic situation of German hospitals is
influenced to a large extent by the structures and framework conditions, which developed through previously described regulations. In addition, however, for several reasons the demographic structure is a determining factor for financial exposure of an entire health care system (Association A, 2014; Hospital A, 2014; Hospital C, 2014). The so-called two-pronged ageing ("doppelte Alterung") describes the situation in Germany, that is characterized by low birth rates with simultaneously increasing life expectancy (Busse & Geissler, 2013, p. 5). This leads to a demographic structure with few young people and a large number of older people. While the portion of people younger than 14 represent only 13 % the total population, people older than 65 already make up 20 % (Statistisches Bundesamt, 2014b). According to projections of the Statistisches Bundesamt, this share will increase constantly up to 34 % until 2060 (Statistisches Bundesamt, 2009, p. 16). The importance of that issue for hospitals becomes clear, when considering those people of 65 years of age and older make up for 45 % of all stationary patients (Busse & Geissler, 2013, p. 5). Scheidt-Nave, Richter, Fuchs, and Kuhlmeier (2010) state that it is often observed that older people suffer from several illnesses at the same time, which is called multimorbidity. Moreover, at a greater age, the risk for chronic diseases rises demonstrably (Böhm, Tesch-Römer, & Ziese, 2009, p. 12). There is a debate in the scientific community if increasing life expectancy tends to increase the amount of healthy years of a human's life (compression thesis) or if it rather leads to additional years of illness (medicalization thesis). While the latter would cause much higher demand for hospital treatment, the effect would be less drastic in the case of a validity of the compression thesis (Busse & Geissler, 2013, p. 11). Although to a different degree, both cases, however, will most probably result in a rising demand for medical treatment and a higher number of hospitals cases, as one can already observe these days. This is problematic because medical treatment is far more expensive for older people than for young ones (Korff, 2012, p. 25). Against this background, public coffers and statutory health insurances are expected to be strapped for cash in the future and already try to limit expenditures today.

For hospitals this dilemma is exacerbated by the medical-technical progress. Korff (2012) points out that in contrast to other industries, in the hospital sector, technical advances of health care do not reduce costs. Rather, they induce costs and create new treatment possibilities (Korff, 2012, p. 25). Regarding the demographic structure, medical-technical progress has a life-prolonging effect. Formerly deadly diseases like
HIV (human immunodeficiency virus), diabetes or cancer have become chronic diseases, with which affected patients can live for a long time (Busse & Geissler, 2013, p. 4). Hospital B (2014) also argues that medical progress has a negative effect on material expenses of hospitals, which will be discussed in the following chapter as part of the operating costs.

4.2 Increasing Operating Costs

Personnel Costs

As already described in chapter 2.2.3, occurring costs for inpatient care need to be divided into two categories: Operating costs, mainly consisting of personnel expenses and material costs, and investment costs for buildings, beds and any kind of medical equipment. Traditionally, personnel costs amount for about two thirds of all inpatient costs. Hospitals therefore complain the burden that wage tariffs are growing faster than their incomes through state-wide base rates are able to compensate (Hospital C, 2014; Hospital D, 2014). The development of inpatient costs in the hospital sector is displayed in figure 10. The light blue bars show that despite increasing wage tariffs, the share of personnel costs on total hospital expenditures has risen in 2012 for the first time after eight years of decline. From 2003 to 2011, the share of personnel costs decreased from 65.3 % to 60.1 % before it increased again to 60.5 % in 2012. Especially in the first years after the DRG-Introduction the portion of personnel expenditures declined significantly. Augurzky et al. (2014) explain the reversal development of wages and share of personnel costs by a reduction in staff. In the course of economic optimizations and restructuring measures, hospitals reduced the number of staff through dismissals and outsourcing activities (Augurzky et al., 2014, p. 42).
In addition to the rise in tariff wages, the increase of personnel costs can be explained by a change of the hospital's personnel mix (Hospital D, 2014). In the hospital sector, personnel costs are generally divided in four main cost blocks: Nursing service, medical service, medical-technical service, and functional service. Between 2002 and 2012, nursing service and medical service amounted for about 60% of all personnel costs. Both cost types, however, followed opposite trends. During the mentioned period, the share of costs for nursing decreased from 39.4% to 31.2%, whereas the share of costs for medical services increased from 21.6% to 30.4%. To a large extent, this development can be traced back to recent changes in the hospital sector, described in chapter 2.4. On the one hand, nursing personnel was reduced by 4.3% between 2002 and 2012 as a consequence of upcoming cost pressure and shorter LOS. On the other hand, especially because of the strong increase in hospital cases, but also due to additional bureaucratic tasks, which arose since the DRG-Introduction, the demand for medical staff increased. Accordingly, the number of staff employed in medical service increased by 26.6% within that period. The effect of the shift in the personnel structure was even strengthened because of the fact that personnel costs per employee on average increased twice as fast as for medical service (+36.0%) than for nursing service (+18.1%). If in addition, the average seniority of a hospital's employed personnel increases, a
hospital has to cope with growth rates for personnel costs which are even much higher than reflected in the growth rates of wage tariffs (Hospital D, 2014).

**Material Costs**

Compared to personnel expenses, material expenses of German hospitals have grown a lot more strongly. They have increased in both ways, in absolute figures and in relative terms as a portion of total costs as shown by green bars in figure 10. From 2002 to 2012 the share of material expenses increased from 33.7 % to 38.0 %, which is equivalent to an absolute rise of 55.8 %. Within the last ten years, about half of those expenditures were made for medical supplies, growing parallel to total material costs. The rest is distributed over nursing charge capable maintenance, management, water and energy, administration, and food and other costs. Even though all these positions grew substantially, other costs, including rent and lease expenses and material costs for education and training sessions grew disproportionately strong. The causes for those massive increases in costs for materials are diverse and more difficult to justify than for personnel costs.

As already explained above, medical-technical progress is not only an advantage for the population's health. Ever since, it has been decisive for the improvement and efficiency of medical treatment on the one hand, but also for the development of costs of such medical care provided on the other hand (Busse & Geissler, 2013, p. 6). Hence, the medical-technical progress is always associated with doubts as to what extent the use of new medical resources and procedures is appropriate. Busse and Geissler (2013) hold that this development has led to an increased number of hospital cases, which can be observed especially with medical imaging based procedures as well as procedures on the nervous system and on movement organs. All interviewed hospitals confirm that the medical-technical progress is significantly contributing to the burden of cost development (Hospital A, 2014; Hospital B, 2014; Hospital C, 2014; Hospital D, 2014). A concrete example is given by Hospital B (2014). It explains that 20 years ago medicine has been much more reluctant with surgical operations to implant knee prosthetics because the prosthetics were movement impairing and not very durable. Due to the medical-technical progress, these problems do not exist anymore. New knee prosthetics last forever and have almost no limitations any more regarding replacement
or the patient's movement abilities. Therefore, such medical surgeries are performed much more often these days:

"[... ] Ist natürlich auch der medizinische Fortschritt ein Stück weit schuld. Wenn man bei der Hüftprothetik oder Knieprothetik sich das anschaut, vor 20 Jahren war ganz klar, immer warten, Schmerzen aushalten, warten, warten, warten, bloß keine Prothese, weil die muss irgendwann getauscht werden, die hält nicht so lange, ähm, und der, nach dem Tausch ist man gar nicht mehr mobil, also warten, warten, warten. Heutzutage, die Dinger halten ewig, die Dinger sind sehr mobil, die Leute können gut damit umgehen, die Revisionen sind kein Drama mehr heutzutage. Das heißt, man ist natürlich auch forscher." (Hospital B, 2014)

Cost increases in hospitals are, therefore, not only associated to increasing prices of existing positions, but also to upcoming innovations. Since these innovations can involve enormous additional costs, their necessity is not seldom being called into question. This was the case, for example, when Moss et al. (2002) published a study in The New England Journal of Medicine, which showed that for patients with a prior myocardial infarction and advanced left ventricular dysfunction, the prophylactic implantation of an implantable cardioverter defibrillator (ICD) significantly improves survival rates. The analysis was based on a trial with 1,232 randomized patients (Moss et al., 2002, p. 879). Moreover, the study showed that a therapy with an ICD was the more successful, the longer it was implanted after a myocardial infarction (Moss et al., 2002, p. 877). Based on these results, the authors recommended a therapy with the implantation of those defibrillators, which resulted in a strong increase of those expensive ICD implantations in Germany:

As this example shows, every innovation always brings along a new wave of costs. This does not only hold for implants, but also for drugs and medical devices. Bartsch (2006) argues that big business concerns invest huge amounts of money in the development of such innovations. Moreover, there is generally only little time until competing producers come up with their own products. This makes new treatment methods extremely expensive. Therefore, the medical-technical progress oftentimes grows faster than the available resources to finance it (Bartsch, 2006, p. 13). The statutory health insurances that are obliged to reimburse all hospital treatment cases through DRGs, criticize the high number of cases and the lax introduction of innovations. They are collectively represented by the National Association of Statutory Health Insurance Funds, which published a position paper in 2013, including 14 positions on possible reforms for the hospital sector. In position 14, the GKV-Spitzenverband holds that a comprehensive application of innovation should only be possible after a legally prescribed pre-testing in special innovation centers (GKV-Spitzenverband, 2013, p. 19).

Although the legislator has already enabled better opportunities for testing of innovations, there will always be a conflict between medical advancements and the willingness or the ability to pay for it, especially since the added value is difficult to determine. Hospitals, however, not at least because of the increasing competitive pressure feel themselves forced to apply new treatment methods:


Against the backdrop of the demographic structure and the medical-technical progress, Korff (2012) states that it is expected that personnel costs and material expenses of hospitals will continue to increase in the future. This assessment is shared by all of the interviewed hospitals (Hospital A, 2014; Hospital B, 2014; Hospital C, 2014; Hospital D, 2014).

**Administration Costs**

Not only personnel costs and costs of new medical technology increased over the last years, but also the DRG-System itself led to an increased need for medical controlling
activities, since internal steering processes have become much more important. Braun et al. (2007) state that the considerably shorter LOS do not only cause pressure on nursing personnel, but also require more administrative coordination. Furthermore, he states that the development of the DRG-System increased the transparency of treatments as well as the differentiation of pricing relations. Compared to 664 DRGs in 2003, the German DRG-System specifies 1,187 DRGs in 2013 (InEK, 2012, p. 202). The interviewed hospitals agree that the system increased the accurate picture of the performance, but at the same time they claim that administration costs considerably stresses their budgets (Hospital A, 2014; Hospital B, 2014; Hospital C, 2014). Australia, where the system has its origin, manages its system with much less groups so that a rather smaller complexity is in place. Compared to Australia, Germany's detailed DRG-System is often regarded as too complicated:

"[…] In Australien […] gibt es 500 solcher Fallpauschalen. Da gibt es, glaube ich, ein oder zwei Menschen, die sich für ein mittelgroßes Krankenhaus darum kümmern, das abzurechnen und dann war es das. […] Wir Deutschen wir sind viel genauer, wir haben mittlerweile 1.200 DRGs. Da haben wir noch vier, fünf Stufen drin in diesen DRGs mit Schweregraden. […] Wir haben da mittlerweile ein System etabliert, wo in jedem Krankenhaus drei Ärzte sitzen, das Controlling machen, vier Schwestern, die, die Abrechnung machen, wo auf der Krankenkassenseite vier Ärzte sitzen, die, die Abrechnungen überprüfen und mittlerweile sich Menschen – medizinisches Personal – um die Abrechnung kümmert, was weit von einer Vereinfachung ist, weil diese hat es früher nie gegeben."

(Hospital B, 2014)

In a research study by the consultancy A.T. Kearney, Scheel, Thiry, Schmidt-Rhode, and Berenbeck (2011) found out that German hospitals receive the largest share of statutory health insurance expenses. Hereby, they claim that out of this share, 22 % are used for administrative processes. In 2011 this amounted to 13.6 million Euros. The research study holds that hospital physicians spend 37 % of their working hours for administrative tasks. Some assistant doctors spend even 80 % of their time for those tasks. Nonetheless, this consultancy report needs to be treated with caution, as the perspective might be quite biased. Such consultancy reports are oftentimes not fully objective, especially when they are prepared for certain interest groups. Furthermore, it is likely that the administration costs are set too high because the research study surveyed only physicians, pharmacists, and medical houses. However, both interest
groups – the statutory health insurances and hospitals – agree in the point that the DRG-System has led to the need for higher spending in administration.

The authors of the consultancy A.T. Kearney state that this inadequacy leads to a loss of quality not only in the medical treatment, but also in the nursing segment. Hereby, the inadequacy is explained by increased tasks of coding medical diagnoses and processes according to the ICD and entering data into the hospital information software. Bartsch (2006) points out that the coding is very complicated, as physicians have to adapt every year to new standards. Almost one third of the working time of a hospital physician is used for the documentation, as only few hospitals have coding assistants in charge. Therefore, many mistakes happen, as the physicians are often unable to cope with the system. Above all, Hospital B (2014) argues that the examinations of the MDK are very time consuming as the monthly investigations cause disputes between sickness funds and hospitals. Hereby, the chief physicians needs oftentimes to explain why certain treatments were necessary to employees of the MDK who have less medical knowledge, for instance assistance doctors. The hospital considers the meetings as a waste of valuable time of the physicians and points out very drastically:

"[...] Zeit eines hoch qualifizierten Arztes wird verbrannt, einmal im Monat einen Tag in der MDK-Begegnung. Da kann man nur noch Pistolen kaufen und dreimal draufschießen, weil so geht es nicht." (Hospital B, 2014)

Also Hospital C (2014) claims that the administration effort caused by the MDK examinations is based on the fact that the MDK actually searches for mistakes of the hospitals so that they do not have to fully compensate the hospitals. It argues that most of the time the sickness funds claim that the inpatient care took too long or was even not necessary as the patient could have been treated outpatient, although the treatment itself is in the interest of patient. Hospital C (2014) states that in some cases the system as such is abused for the interests of the statutory health insurances:

"Und eigentlich ist es ein gutes System das [...] zum Teil auch missbraucht wird." (Hospital C, 2014)

On the other hand, the National Association of Statutory Health Insurance Funds claims that more than 50 % of the examined invoices are incorrectly. This causes costs of roughly two billion Euros every year (GKV-Spitzenverband, 2013, p. 15). The association holds that general accusations of too high administration costs are not
correct. According to them, most of the costs originate from the fact that the statutory health insurances are interested in an assessment of how patient treatment can be improved. Therefore, a detailed record-keeping and the creation of quality reports are important to detect treatment mistakes (Lanz, 2012).

4.3 New Challenges in the Funding of Investments

After having evaluated the development of costs, the following two chapters will deal with the two income sides within the dual hospital financing. As explained in chapter 2.2.3, the Federal States are responsible for financing the investments of hospitals, which are included in the hospital plan. In most of the cases, this holds for hospitals under public or independent charitable ownership. Hence, their investment activities for buildings, beds and medical equipment have to be publicly funded through so-called KHG subsidies. An essential problem for many hospitals is the decreasing provision of these funds by the Federal States due to empty public coffers. It has become common practice that hospitals have to wait for several years until the funding of new investments get approved (Viering & Söhnle, 2010, p. 6). The exact amount of the total investment bottleneck of all German hospitals can only be estimated. Most often, an amount of about 50 billion Euros is cited, which was a result of a survey conducted by EMNID launched in by the Spectatis – the German industrial association for optical, medical, and mechatronic technologies (Spectaris, 2010). However, with respect to subjective interests of sponsors of the study, this amount has to be questioned (Association A, 2014). Based on the evaluation of annual statements Augurzky et al. (2014) provide data, which show that the sum of all German KHG subsidies in 2013 amounted only 2.72 billion Euros. This is much less compared to 1990, when the inflation-adjusted KHG subsidies summed up to 4.3 billion Euros (nominal: 3.6 billion Euros). The decrease becomes even more obvious when displaying the subsidies as a ratio of total revenue: While in 1991, hospitals received on average KHG subsidies that made up for 10.1 % of their revenues, they only received 3.6 % in 2013 (Augurzky et al., 2014, pp. 47-48). Also, these calculations cannot be taken as fully objective, but the severity of the problem has been confirmed by all interviewed hospitals (Hospital A, 2014; Hospital B, 2014; Hospital C, 2014; Hospital D, 2014).

The probably most well-known example for a hospital suffering from an investment bottleneck is the University Hospital Charité in Berlin. Although Charité could generate
a positive net income for the year 2013 of 1.59 million Euros, its investment needs cannot be covered for several years (Charité – Universitätsmedizin Berlin, 2014, p. 13). According to a joint opinion of The State Representation of Alternative Health Funds ("Landesvertretung des Ersatzkassenverbandes – vdek") and the Hospital Association of Berlin ("Berliner Krankenhausgesellschaft – BKG") the State of Berlin effectively provides only 60 million Euros per year. In their opinion statement, vdek and BKG (2013) hold, however, that actual yearly need would amount 200 million Euros. A large share of medical devices is already written off. The causes for the high investment backlog can be quickly explained: The State of Berlin simply does not have the resources to fund the required investments, as Hospital A (2014) explains:

"[...] Die Charité, größtes Krankenhaus in Europa, was unter einem Milliardeninvestitionsstau leidet und der letztendlich ja nur abzubauen ist, wenn das Land Berlin die entsprechenden Mittel bereitstellt und ja, warum das Land Berlin das nicht tut, liegt glaube ich auf der Hand. Das Land Berlin hätte die Mittel gar nicht oder müsste das eben durch erhöhte Steueraufkommen oder wie auch immer erst mal finanzieren, was einfach nicht machbar ist." (Hospital A, 2014)

The example of Charité is not an isolated case. Weymayr (2006) holds that university hospitals are affected particularly bad. He argues that such hospitals active in the maximum care segment are disadvantaged since they have to deal with severe treatment cases, for which they need to provide extraordinary expensive equipment. At the same time, increasingly less public funds are provided for the university hospitals' research activities (Weymayr, 2006, p. 109). But also other hospitals, which are eligible for public funding, are affected severely. Malzahn and Wehner (2010) point out that the decrease in KHG subsidies has to be differentiated between the support of individual projects and lump-sum subsidies. According to the KHG, individual projects for long-term investments like new buildings or refurbishment are financed upon application of a hospital. Smaller construction measures or replacements of short-term fixed assets on the other hand are financially subsidized by annually fixed lump-sums. The eligibility and the height of those lump-sum subsidies are regulated by state-specific factors such as beds and uniform value relations or performance groups. A striking aspect is that the lump-sum subsidies were paid on a relatively stable level within the last 15 years. It therefore seems that the lump-sum subsidies are less under political influence than the funding of individual projects. The steep decline in the funding of hospital investments can exclusively be attributed to the Federal States' rejections of applications by hospitals
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(Malzahn & Wehner, 2010, pp. 110-111). This shows that the Federal States have cut back the funding of hospitals’ investment contrary to their legal obligation.

In addition, the resulting investment bottleneck is further reinforcing due to increasing demands on hospital infrastructure. Since the DRG-Introduction, hospitals are forced to design their internal processes with greater efficiency. Friemel (2006) holds that many hospitals are not geared up to these challenges. Outdated construction designs impede smoothly running processes and high processing quality. Oftentimes, the distances between diagnostic departments and nursing care rooms are too long. Moreover, elevator capacities do no longer comply with the upgraded operational capacities. Today, so-called effective and flexible hospital concepts are required rather than the old room designs, where the operating rooms adjoin anaesthetization rooms, washrooms, sterile rooms and transfer units (Friemel, 2006, p. 62). In such old room designs, an occupied operating room also occupies several adjoining rooms. The first prototype of a modern hospital complex was built in 1995 in Meiningen by the Rhön-Klinikum AG (sold to HELIOS Kliniken GmbH in February 2014). Here, operating rooms are centered in the middle of loosely connected neighbor rooms, which are logistically connected to different functionality areas. Buildings like these consist of modules that allow subsequent extensions. But also the interior architecture allows variability: Room sizes are adoptable due to movable partition systems and as well as cables and conductors are laid inside the floor instead of walls in order to allow later implementations of new technical equipment. Furthermore, with the trend toward medical care centers the integration of outpatient clinics has become important. Modern centers locate outpatient clinics in surrounding buildings with separate entrances to not give the patients a feeling of hospital atmosphere. (Friemel, 2006, pp. 62-63)

The realization of such concepts, however, is very expensive and constitutes an additional burden to hospitals supplementary to the cost increase described in chapter 4.2. Although the amendments of the example above might not be relevant for every hospital, the newly arisen efficiency-driven hospital environment has brought about new expenditures, which were non-existent twenty years ago. Accordingly, Hospital B (2014) self-critically admits:

"Kostensteigerungen im Krankenhaus sind eben nicht nur Steigerungen, sondern auch neue Kosten, die früher so nie da waren." (Hospital B, 2014)
In connection with the competition between hospitals, there has come up a real race for patients. For this purpose, hospitals find themselves compelled to invest huge amounts of money in a so-called hotel comfort for aesthetic buildings, appealing entrance halls, and modern nursing care rooms. Hospital B (2014) claims that such investments might be pleasing for treated patients, but do not generate any additional revenue:

"Das Krankenhaus soll modern und schön sein und für die Landkreisbevölkerung auch toll sein, also wird investiert und erwartet man das ja auch ein Stück weit. Aber, es gibt da die kritische Anmerkung, Beton macht keine Patienten. Das ist schön für die Patienten, die da sind, aber es macht keine Patienten und damit ist es häufig so, dass zwar das Krankenhaus schön ist, aber nicht zwingend mehr Umsatz gemacht wird, weil halt auch nicht zwingend mehr Patienten da sind, leider." (Hospital B, 2014)

According to Hospital B (2014), the same holds for investments in medical equipment. It states that hospitals are involved in a competition to offer their patients best possible comfort. Today, even small hospitals would not feel competitive enough if they cannot offer own computer tomography (CT) or magnetic resonance tomography (MRT). They strive to have large and expensive equipment available on site since they do not want to be in need to pass on the patients to other clinical facilities or specialist. This development is a consequence of increased customer perception. Also, Viering and Söhnle (2010) hold that hospitals take on the competition by offering an enjoyable atmosphere and modern outer appearance. Considering that patients may only to a limited extent be able to judge the quality of medical treatment and health care services as explained in chapter 2.1.1, this trend is just a logical consequence of the changing circumstances in the sector:

"Ein altes Krankenhaus fühlt sich nicht mehr konkurrenzfähig, wenn der Nachbar Zweibettzimmer hat und ich habe noch so alte Dreibettzimmer, da gibt es auch ein Stück weit einen Wettlauf. In dem Komfort, die (...), ich sage jetzt nicht mal Qualität, aber in dem Komfort, dem Hotelkomfort der Kliniken entstanden ist und die Ausstattung der Kliniken entstanden ist, man braucht heute MRT, man braucht heute ein CT, Großgeräte im Kleinkrankenhaus, man muss alles vorrätig haben, damit der Patient das Gefühl hat, hier kann er alles bekommen, man muss nicht woanders hingehen, weil die können das nicht. Das hat also auch ein gewisses Wettrüsten im Gesundheitswesen stattgefunden und da, dass das System nicht finanziert und nie finanziert hat, schon gar nicht in dieser Form finanziert, entsteht dieser Investitionsstau auf der einen Seite, entsteht das Phänomen, dass die Krankenhäuser es selber finanzieren." (Hospital B, 2014)
Analyses of Augurzky et al. (2014) show that as a result of the lack of public subsidies, hospitals systematically turned to fund a large share of capital investments out of their operating income. The authors assume that this practice has become more common in the last few years (Augurzky et al., 2014, p. 51). This implies that the withdrawal of the Federal States from the funding of investments is now compensated by the use of the funds provided by the health insurances, which is often described as the problem of a creeping monistic (Association A, 2014). A similar argument is also put forward by the GKV-Spitzenverband (2013), which claims that this development contradicts the fundamental idea of the dual hospital financing as the remuneration through DRGs, financed by the contributions of the insured, is intended to exclusively cover the hospitals operating costs (chapter 2.2.3). The association underlines that the fundamental principles of hospital financing are now more than 40 years old. While since 1972, the remuneration system has been modernized and became performance oriented, the capacity planning by the Federal States has become outdated. Therefore, in point three of the opinion statement, the GKV-Spitzenverband demands a ground-breaking revision of the KHG-principles (GKV-Spitzenverband, 2013, p. 7). Due to a disproportionate high responsibility for hospital funding, the association speaks up for more rights of influence with regard to investment decisions and annulment of the obligation to conclude a contract (chapter 2.1.1). Whether and in what form the dual-financing model will be adjusted is not yet foreseeable. Hospital D (2014), however, holds that in each case an easing of the tense situation for the hospitals cannot be expected since also the health insurances itself have to deal with continuous cost pressure (Hospital D, 2014). This pessimistic outlook is also shared by the other interviewed hospitals (Hospital A, 2014; Hospital B, 2014; Hospital C, 2014). Hospital C (2014) underlines this expectation with a cynical saying:

"Wenn es nach den Krankenkassen geht, was wir für Autos fahren, dann wäre der Trabant immer noch ein Erfolgsmodell." (Hospital C, 2014)

4.4 Competitive Reimbursement of Hospital Cases
Although the introduction of the DRG-System has brought about competition and cost pressure, all interviewed hospitals hold that the basic idea of a performance oriented reimbursement cannot be blamed as a cause of a crisis (Hospital A, 2014; Hospital B, 2014; Hospital C, 2014; Hospital D, 2014). Hospital B (2014) holds that initially hospitals refused to endorse a system change. Health insurances did not have any
valuable information about what the hospitals were exactly doing (Hospital B, 2014). This freedom has now been taken away from them. Hospital B (2014), however, also argues that the transparency induced by the DRG-System had been also a chance for hospitals to demonstrate their productivity toward the health insurances. Considering the cost-explosion and the misleading incentives within the former system outlined in 2.2.3 the system change had been just a logical step. Hospitals that are not able to deliver good quality, operate efficient and have a good management at its disposal have to suffer since the new reimbursement model (Hospital A, 2014). The probably most often mentioned sentence in connection with the DRG is: "Same performance, same price". From an economic logic, this principle sounds like a fair methodology to allocate scarce resources. The reality in the hospital sector, however, has proven to be much more complex. Oftentimes, hospitals complain that the remuneration through DRG would not be adequate (Sywottek, 2006, p. 66). One reason for that is that the compensation is not based on actual costs, but on extensive calculations. As explained in chapter 2.3.3, the DRG reimbursement considers average costs of the entire sector. Hospital D (2014) holds that this methodology causes severe problems for many hospitals because every time a hospital is able to achieve lower costs, this also means lower compensations for the next period. Consequently, the German DRG-System forces hospitals not only to reduce costs to a certain level, but to permanently find a new potential to reduce their costs:

"Ähm, jetzt können wir einerseits sagen, das ist ja auch ein bisschen gewollt und so, allerdings, ähm, also einerseits könnte ja jetzt man auch kassenseitig oder auch einfach gesetzlich sagen, klar, irgendwo wenn auch etwas optimiert wird, da muss das irgendwo auch der Allgemeinheit zugutekommen, andererseits ist es auch so, alle haben jetzt irgendwie unheimlich daran gearbeitet, dass die Kosten irgendwo sinken, ähm, und dann dauert es im Grunde nicht lange, da muss man eigentlich schon wieder neu anfangen und sagen wo haben wir denn die nächsten Potenzial. Also das ist zumindest der Fall, wenn man in dieser Schere ist, Personalkosten, Sachkosten und Refinanzierung, ja, dann schließt man die Lücke für zwei Jahre, aber dann senken sich die Erlöse auf einmal schon wieder ab und man muss wieder die nächsten 10 Punkte machen, ja." (Hospital D, 2014)

The InEK argues that this principle is fair since it considers actual costs of all types of hospitals, the more and the less efficient ones (Sywottek, 2006, p. 66). Using this scheme, the InEK calculations do not prescribe any pre-determined figures, but actual costs of the entire sector. Nevertheless, Hospital B (2014) claims that this system
demands permanent progress within hospitals, which is very hard to realize. A performance, which is sufficient to operate profitable today might not be sufficient in the following period:

"Wenn sie jedes Jahr das Gleiche tun, werden sie jedes Jahr immer weniger Geld haben, obwohl sie immer das Gleiche tun." (Hospital B, 2014)

Moreover, it is often claimed that certain parties are disadvantaged by the DRG-System. Hospital B (2014) and Hospital C (2014) hold that this applies especially to hospitals active in the regular and primary care as well as to university hospitals offering maximum care. University hospitals for example have to deal with particularly serious cases that cause extremely high costs, which are not yet adequately compensated by DRGs (Hospital C, 2014; Sywottek, 2006, p. 66). This concerns cases like multiple diseases or severe burn injuries. In such cases, hospitals have to bear large shares of the costs alone. On the other hand, there are areas in the hospital sector that are fairly lucrative within the DRG-System. Guerriero and Guido (2011) point out that elective surgeries can be conducted much more efficiently than surgeries, which cannot be planned. Providers of all kind of schedulable treatment have proven to benefit from the DRG-Introduction. Hospital B (2014) holds that for example in the field of cardiac surgery, surgical procedures can be tightly planned and executed. This allows that contingency costs can be optimally utilized. Personnel and other variable costs on the other hand can be reduced to a minimum. Hospitals in the field of regular care offering variable treatment and emergency services, however, cannot benefit from those attractive classification schemes. Since they need to provide capacities irrespective of actual utilization, those hospitals have much greater difficulties to operate profitable (Hospital B, 2014).

Another aspect by which hospitals claim to be threatened refers to the abatements and deductions. Rosenbrock and Gerlinger (2014) hold that many hospitals suffer from deductions as a result of the so-called "double degression", which reduces the reimbursement for every case if the number of conducted cases exceeds the previously agreed level. The double effect of this regulation occurs because the degression also reduces the average prices for the following year. This does also effect other noninvolved hospitals. Moreover, hospitals often have to deal with conflicts when it comes to the reimbursement of cases. According to the incentives set within the DRG-
System, hospitals try to work profitable by dismissing their patients much earlier than in former times. Thereby, they strive to find a balance between reducing their costs by keeping LOS as short as possible and not risking to be fined with abatements as already explained by figure 8 in chapter 2.3.5. Hospital B (2014) claims that the abatements, which are supposed to protect patients from early dismissals are oftentimes abused by the health insurances. On the one hand, the DRG-System pushed hospitals to reduce LOS. But on the other hand, when they get close to the minimum length of stay, they risk slipping below the minimum threshold as a result of subsequent deductions or denials, which can become very costly. Between these two points, hospitals walk a fine line. Although the MDK is commissioned to undertake inspections as a neutral assessor, these issues within the billing methodology are matter of permanent conflict since only little changes in the invoicing procedure can have a significant financial impact:

"[...] Um das zu verhindern, hat man im deutschen DRG-System eine untere Grenzverweildauer eingeführt, dass man gesagt hat, vor ein, zwei Tagen darf der nicht nach Hause, sonst gibt es Abschläge. „Sonst bekommst du weniger Geld, weil du hast ihn so kurz behandelt, das machen wir nicht“. Und das ist mittlerweile zu 85 % die Prüfquote des medizinischen Dienstes. Die Leute werden immer kürzer behandelt, weil das von den Krankenhäusern verlangt wird, weil es die Synergieeffekte, die betriebswirtschaftliche Ausrichtung gebietet. Also rutschen immer mehr Patienten an die untere Grenzverweildauer heran. Wenn sie dann einmal in der Nähe sind, dann sagt die Kasse, „wenn ich jetzt noch einen Tag finde, der vielleicht nicht notwendig war, dann habe ich einen sehr großen Effekt“."
(Hospital B, 2014)

According to Sywottek (2006), about 10 % of all billings for hospital cases end up at the MDK. Apart from the LOS, the most common point of issue is the secondary diagnosis, which can significantly boost DRGs. In such cases for example, hospitals and health insurances dispute about the necessity of certain levels of care. In order to counteract the difficult circumstances described above, hospitals are oftentimes blamed to increase the number of cases, seeking to enhance their profitability (Association A, 2014; Busse, Schreyögg, & Smith, 2006, pp. 211-213). Since almost all determinants that regulate the remuneration of cases are fixed the number of conducted cases has become the largest lever for hospitals to increase their income (Hospital B, 2014). Furthermore, the amount of remuneration that hospitals can bill depends on the CMI, explained in chapter 2.3.3. Accordingly, the National Association of Statutory Health Insurance Funds, GKV-Spitzenverband, criticizes the development of increasingly severe hospital cases and the
rising number of conducted cases, displayed in chapter 2.4. While many hospitals explain this phenomenon by the demographic development and medical progress (Hospital C, 2014), Klein-Hitpaß et al. (2014) on the other hand hold that this does only explain one third of the increased numbers. In their report "Optionen für eine versichertenerorientierte Steuerung", the authors who work for the GKV-Spitzenverband claim that between 1991 and 2011, the quantity of annual cases has risen by about 25 % to an amount of 18.3 million cases. In addition, since the DRG-introduction the case mix grew by 2 to 3 % per year which is even more than the annual rise of conducted cases of 1.7 % (Klein-Hitpaß et al., 2014, pp. 253-254). Klein-Hitpaß et al. (2014) refer to OECD statistics, which reveal that knee and hip prosthetics are implanted twice as often per 100,000 inhabitants in Germany compared to the OECD average (Klein-Hitpaß et al., 2014, pp. 252-253; OECD, 2013, p. 87). Accordingly, the GKV-Spitzenverband espouses adjustments of price levels and a reduction of overcapacities. On the one hand, the OECD figures are absolutely clear without ambiguity. Nonetheless, one should not forget that knee and hip implants have developed over the last decades with the medical progress as already explained. Furthermore, these procedures are elective and therefore not to be mixed up with other treatments. A general reduction of prices would harm those hospitals, which already have to cope with less profitable cases.

Although the interviewed hospitals refuse an intentional increase of entire cases at the expense of the health insurances, Hospital D (2014) admits that at least partially some incentives do exist. Just like the health insurances might be willing to reduce permissions for DRG reimbursements, also hospitals might try to optimize their DRG by influencing LOS or conducted services:

"Das System setzt schon ab und zu mal Anreize, dass man sagt „gut, mache ich mal eine Leistung mehr, bekomme ich vielleicht irgendwo vielleicht eine andere Staffel in der Abrechnung“, ähm, also ich glaube gar nicht, dass das alle Krankenhäuser so gut steuern können. Wenn man zum Beispiel genau weiß, bei seinem bestimmten Behandlungsspektrum gibt es die und die Stellen, damit erreiche ich eine höhere Abrechnung – also ich muss die und die Maßnahmen ergreifen oder Verweildauer erreichen oder anderes, äh, dann kann ich damit meine Abrechnung natürlich auch optimieren." (Hospital D, 2014)

Hospital B (2014) points out the problem even more drastically by stating that a system, which is based on the reward of quantity, will naturally induce quantity. The improved
transparency on the other hand has created a basis for health insurances to have measurable arguments to call for cutbacks and limitations:

"Ein System, was Menge belohnt, wird Menge bekommen – zumindest an bestimmt en Stellen. Gleichzeitig haben die Kassen jetzt Transparenz und sagen, „was kann ich denn jetzt dafür tun, um das nicht alles bezahlen zu müssen“. „Jetzt habe ich jegliche Daten, die ich früher nicht hatte, jetzt schaue ich doch mal, dass ich in den Daten so lange bohre, bis ich aus meiner Bewertung etwas finde, was nicht sein muss“. (Hospital B, 2014)

4.5 Why "The Privates" and Hospitals in Co-Operations can Realize What Others Cannot

The trends outlined in chapter 2.4 revealed that more intense competition and cost pressure has induced an ongoing market concentration. Already many hospitals either exited the market or were swallowed by private hospitals. Those hospitals, which are still under public or independent charitable ownership more and more frequently establish co-operations or join together into associations. These developments suggest that all other hospitals are suffering from competitive disadvantages. Or, expressed positively, large private hospital chains such as Rhön, Fresenius/Helios, Asklepios and Sana or hospitals organized in network structures are able to operate much more economically efficient. Schlüchtermann (2013) holds that this market transition trend can be justified by several reasons. Nonetheless, the investment bottleneck described in chapter 4.3 due to lacking funding possibilities of public authorities is certainly the most significant issue for such hospitals. Busse and Geissler (2013) note that in former times only smaller hospitals were private. Today private players are on every level of medical care, namely the regular and primary care, specialized care, maximum care as well as in university hospitals. As the private sector makes use of industrialized processes with the result of higher efficiency and better cost-structures they are in a much better financial situation than public or independent charitable hospitals (Korff, 2012, p. 6). Usually, private hospital chains are able to better manage their hospital care and to buy at more favorable rates due to harmonized ordering processes and large volume discounts. Also, private hospital networks benefit from their consolidation in human resource management, IT, marketing, Facility Management, and innovative forms of care, so that economies of scale can be achieved in the form of chains (Schlüchtermann, 2013). In contrast to public and independent charitable hospitals, private hospitals understood very early that optimizing operative processes based on Lean Management activities
allows increasing the efficiency of the medical treatment provision. Hereby, introducing the focus on customer care and avoidance of operations that are not contributing to an increased customer benefit are key elements (Lingenfelder & Pöhls, 2011, p. 12). Lean Management above all includes the knowledge about efficient use of personnel and material resources as well as the outsourcing of specific non-medical services like payroll, food, and laundry (Wettke, 2007, p. 31). On the other hand, hospitals need to consider that Lean Management can also lead to inflexible routines that harm the hospital organization (Braun von Reinersdorff, 2007, p. 25). Also, Hospital B (2014) emphasizes that big co-operations often get too big and inflexible to make quick decisions in a centralized hospital structure:

"Wenn Sie vor Ort mal eine Sicherheitsnadel brauchen, dann dauert das drei Wochen bis das durch die ganze Kette durch ist und der oben gesagt hat, „ja die Sicherheitsnadel, die könne wir jetzt kaufen“." (Hospital B, 2014)

Nevertheless, a large part of the success of private hospitals also stems from poor and inefficient cost-structures of other hospitals. As already explained in chapter 2.3.3 and 4.4, the calculation of base rates is based on average costs of all calculation hospitals. Because of more efficient organizational structures, large private hospitals can perform their operations cheaper than many public and independent charitable hospitals and therefore earn more from comparatively high DRG reimbursement rates:

"Der Private lebt im Moment von den Problemen des Öffentlichen. Weil der Öffentliche immer noch betriebswirtschaftlich nicht so gut dasteht wie der Private, kann der Private ganz gut leben." (Hospital B, 2014)

Mertin (2013) criticizes that small private hospitals oftentimes cherry-pick profitable operations. While they oftentimes focus on treatment with higher margins or elective surgeries, other hospitals such as university hospitals have to deal with unprofitable high-cost cases. Also, many private hospitals de-register from the emergency medical service, as it is very costly having sufficient personnel continuously on call. Since many public and independent charitable hospitals face financial pressure especially regarding their lacking investments, public hospitals can take over those hospitals at relatively low prices. Since they have sufficient financial resources and also better means to raise additional capital for large investments and restructuring measures, further acquisitions can be expected also for the coming years (Korff, 2012, p. 21). Hospital A (2014) claims that the trend toward privatization is likely to continue:
"[…] Insofern geht man allgemein davon aus, dass es eine deutliche Marktbereinigung geben wird und im Wesentlichen werden eben die öffentlichen Häuser weniger werden und vermutlich die privaten Häuser eher etwas mehr werden, denn sie sind bereit da investive Mittel auch in die Hand zu nehmen [...]." (Hospital A, 2014)

The district chief executive of Sigmaringen states in the newspaper "Die Welt" that private hospitals have a specific way of thinking. In contrast to public hospitals that are politically bound, they have a different philosophy characterized by a rather business-driven decision making process. Private hospitals are better able to appoint personnel, take advantage of synergies, and hire staff at lower tariffs than the public sector would do. However, the biggest difference between private and public and municipal hospitals is that private ones commit to their shareholders and public hospitals do not have to realize profits (Die Welt, 2014). Heinrich (2012) shows on the example of the acquisition of the "Damp group" hospitals by the private hospital chain Helios how acquisitions are successfully accomplished. Acquired hospitals follow an integration plan that helps achieving an EBITDA-margin of 3 % in the first year and a 15 % EBITDA-margin after five years. On site, Helios analyzes the processes and potentials based on age patterns and treated diseases. Finally, also the competitive set is analyzed. For the daily business this means that hospitals consequently limit the LOS to only the bare necessities based on an internal Helios benchmarking. Hence, Helios hospitals generally try to treat more patients in a shorter period with the same number of personnel. Furthermore, Helios also includes ambulatory healthcare centers ("Medizinisches Versorgungszentrum") in its network in order to link inpatient and outpatient care. Through this, patients can be "customers" before and after the hospital treatment. An objective evaluation of the impact of those structures on quality would be out of scope at this place. Nonetheless, this example illustrates why many hospitals are not yet able to keep up with profitable competitors like Helios.

But also public and independent charitable hospitals have begun to imitate private hospital chains (Neubauer & Pfister, 2008, p. 170). They do not have the capabilities to buy or sell hospitals, but they can co-operate or merge. They do so preliminary out of two reasons: First, to reduce local competition. Secondly, they can achieve specialization and realize cost advantages. By initiating and sharing investments, restructuring measurements of operational procedures, and strategic alliances of medical range of services hospitals create options to survive their struggle for existence (Busse
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& Geissler, 2013, p. 10). The CFO of a private hospital points out that hospital networks get more important as public hospitals compete with private ones for patients, but also for medical staff as it is more likely to attract prestigious physicians if the hospital has "state of the art" medical equipment (Hospital A, 2014). Therefore, public and independent charitable hospitals try to achieve better conditions through networks so that they can for instance create buying associations. Großer (2006) claims that in many German administrative districts a medical oversupply is in place. Particularly in city centers, hospitals are oftentimes located considerably close to each other. Thereby, especially public and independent charitable hospitals offer the same range of medical services so that patients can choose which hospital to go (Großer, 2006, p. 116). This is the reason many of those hospitals have inadequate capacity utilization rates. Nevertheless, also public hospitals can benefit from forming chains like private hospitals. Schlüchtermann (2013) claims that the problem of the public hospitals is not that they do not have the needed knowledge to form chains or co-operations, but rather the lacking implementability. Although in many cases it would be plausible to merge hospitals or to establish networks through co-operations the implementation turns out to be complex. Hospital A (2014) notes that public or independent charitable hospitals mostly face difficulties creating networks and therefore benefitting from synergies, as many political aspects hinder a rational decision-making process. This, for instance, would be the case when a city is the sponsor of a hospital. Since strategic reorientations like mergers or co-operations are often connected to dismissal of personnel, political decision makers often prevent such measures:

"[...] Immer da wo sie politisch motivierte Entscheidungen treffen, können sie wirtschaftlich sinnvolle Dinge oftmals nicht durchsetzen." (Hospital A, 2014)

Private hospitals on the other hand have much more leeway in decision-making, as they are not politically committed. But even those public or independent charitable hospitals that do merge or create co-operations have difficulties to change organizational structures in a way that optimally allows achieving synergies. In order to realize full synergies, reorganization plans oftentimes include decisions like the shutdown of entire hospital units or outsourcing processes. Justifying those steps, however, is difficult for mayors or administrative councils. Most of the inhabitants want to have hospitals within one's reach and with primary health care in every administrative district. Hereby, also rather absurd discussions interrupt important steps toward significant savings from a
unification and centralization of departments. Hospital B (2014) elaborates on the example of the Bavarian city Tegernsee. The city needed to shut down their obstetrics department in the hospital so that expectant mothers would have to visit the close-by hospital in Hausham. This plan caused huge general debate in that region since the inhabitants of Tegernsee did not want their children to be born in Hausham:

"Das geht ja gar nicht – Haushamer. Wer will denn in Hausham geboren sein? [...] Und solche wesentlichen Fragestellungen (ironisch) werden dann in der Politik, in dem öffentlichen Bereich gestellt und im Privaten unter Umständen nicht."

5. Conclusion and Solution Ideas

The underfunding of German hospitals with its historical background, the development of the current hospital environment and actual causes for recent issues have been outlined in detail in the previous chapters. Hereby the specific characteristics of the hospital sector have been described, which differentiate this sector from a market in an economic sense. Due to the inherent incompatibility of governmental intervention regarding the supply of capacities on the one hand, and competition on the other hand, the German legislator steadily introduced new regulations trying to solve occurring problems such as the so-called cost explosion and misleading incentives. After first liberalizations as part of the Health Care Structure Act of 1993, the subsequent Federal Regulation for Hospitals 1995, and finally the introduction of the DRG-System in 2003, the German hospital sector has been going through radical changes. A comprehensive performance based remuneration system has been stepwise implemented, which improved transparency and created competitive structures. Nonetheless, even today many public and independent charitable hospitals have to face increasing economic pressure due to shrinking subsidies of the Federal States, rising cost pressure and missing abilities to adapt to the competitive environment. Considering the current situation, in which about 40 % of hospitals are not able to cover their costs on the one side and the missing funds on the other side, there is still no prospect of a realistic solution for the sector in its present form. Therefore, it is virtually certain that the structural transformation will proceed. In order to form a hospital sector, which is able to sustain under the exceptionally difficult circumstances, it is important to target four key issues, as explained in the following.
Less Hospitals, More Specialization

Market exits of less productive hospitals and the shutdown of entire hospital departments are disputed extremely controversial. Nonetheless, a supra-regionally controlled reduction of hospitals has the potential to improve productivity and to reduce total costs. The concerns that the supply of health care close to the patient could be endangered are only conditionally reasonable. Augurzky et al. (2014) hold that in unregulated markets, exits of market participants paired with market entries are an important factor for innovation and economic growth. In the hospital sector these processes occur rather seldom, which harms a dynamic development. On the other hand, however, the medical-technical progress evolves much faster than many other industries do (Hospital B, 2014). The German hospital sector is known for an extraordinary high hospital density. Taking Saxony as a benchmark, the other Federal States could reduce their hospital density by 14 % to get to the same level. A similar result emerges when comparing German hospital density to the average hospital density of all OECD countries (Augurzky et al., 2014, p. 199).

As described in chapter 4.5, a reduction of hospital capacities is difficult to realize in practice. An active approach to that issue from the political side has been avoided so far since regional voters generally perceive the hospital as a cost-free service offer. Therefore, generally no citizen is willing to support the shutdown of a local hospital, as Hospital B (2014) elaborates on the example of a three small municipal hospitals in Rottal-Inn, which was supposed to be sold to private investors. Hospital B (2014) claims that almost 90 % of local citizen voted against a sale of those hospitals, despite the fact that only about 40 % of them would visit these hospitals. It holds that people rather travel to hospitals in Munich or other close by bigger cities (Hospital B, 2014). The costs for those unprofitable hospitals, however, are financed by the Federal States and health insurances. Augurzky et al. (2014) claim that only in a minority of cases municipal bodies support public hospitals by providing financial means. But even then, many citizens do not perceive those costs. In contrast, the benefit of a local hospital is recognized by almost everyone, even if the accessibility is only of potential matter.

However, a patient-oriented reduction of hospitals should not neglect the fact that there are areas in Germany, where hospital capacities are needed, even though the regional
circumstances do not allow profitable results. Augurzky et al. (2014) argue that this holds for hospitals or hospital departments in rural areas, which offer services that are not offered by any other hospital in that region. The authors state that in Germany this, however, is rather an exception. As already mentioned in chapter 4.5 many German city centers are characterized by hospitals, which offer the same kinds of services. According to an analysis of Augurzky et al. (2014), even in most of the rural areas a market exits of hospitals would not threaten the accessibility of inpatient services. This holds especially for Federal States like Northrhine-Westphalia (NRW). To illustrate this, the GKV-Spitzenverband draws a comparison between Northrhine-Westphalia and the Netherlands. Both have roughly the same number of inhabitants (NRW: 17.9 million, Netherlands: 16.7 million) and a similar size (NRW: 41,500 km², Netherlands: 34,000 km²), but Northrhine-Westphalia provides 401 hospitals whereas only 132 hospitals are located in the Netherlands (Klein-Hitpaß et al., 2014, p. 256). This example shows that the accessibility of health care supplies would generally not suffer from further market exits and reductions of offered hospital services.

The biggest challenge will therefore be to gain acceptance of affected citizens, who might most probably perceive a shutdown of a hospital or a department as a personal welfare loss (Augurzky et al., 2014, p. 200). Therefore, it is absolutely necessary to create a greater awareness of the benefits of such structural changes, which become clearer when considering the actual causes for the problems of the affected hospitals. According to Augurzky et al. (2014) the majority of these hospitals is relatively small, has a low degree of specialization and does not have a unique characteristics. Porter and Guth (2012) attribute the economic problems of those hospitals to the fact that most German hospitals offer a wide range of services. At the same time, the number of conducted cases per service is relatively small. The authors hold that an average German hospital treats 43 % of all DRG cases, while only 28 cases per DRG are conducted. The driving force behind this is the DRG-System, by which many hospitals seem to be incentivized to maximize revenues in many fields. This approach, however, is obviously contra productive from an economic perspective, but also regarding the quality offered (Porter & Guth, 2012, pp. 134-135). Moreover, restrictive admission procedures have prevented hospitals from geographically expanding with the supply of services, which they perform best. A political discussion and an opening up to a
reorganization of the supply of inpatient and outpatient services would therefore be constructive. Citizens need to understand that small volumes of conducted cases lead to lower quality. In an optimal scenario, some of the described hospitals could develop into specialists. Therefore, although citizens might lose the possibility to have a wide range of offered services close by, they might win from a quality perspective. A first step to realize more specialization in the market could be achieved through the introduction of minimum quantities for specific DRGs. Furthermore, the described advantages need to be communicated politically in order to gain the necessary acceptance. (Augurzky et al., 2014, p. 200)

**Less "Dual Monistic", More Capital**

As simple as it might sound: The German hospital sector will need more capital. Further reductions of hospitals, co-operations, specializations and improved processes within hospitals have a potential to make the system more efficient. Nevertheless, considering the demographic structures, there will be no way around the provision of further financial resources. Taking into account the arguments mentioned in chapter 4.1, a look at the age distribution displayed in figure 11 reveals that the inpatient sector will face much higher costs in the future.

**Figure 11: Age Distribution in Germany**

![Age Distribution in Germany](source: Own illustration based on Statisisches Bundesamt (2014b))
Already today, people older than 65 account for more than 45 % of all inpatient cases (Busse & Geissler, 2013, p. 5). Due to the two-pronged ageing, this share will certainly further increase. At the same time, the treatment for this group of people is significantly more expensive than treatment for younger patients. The medical-technical progress and the effect of multimorbidity are likely to strengthen this effect. People born in the baby boom generation are today between 40 and 55 years old as displayed by the blue bars in figure 11. As soon as this generation retires more financial resources will be needed to finance the occurring costs. Additionally, the remaining working population will shrink. Consequently, fewer people will contribute to the income of private and statutory health insurances. The currently existing surpluses of the statutory health insurances will be used up quickly. If one assumes that this will also lead to a staff shortage in the health care sector, personnel costs might become further increase. These developments might lead to a situation in which hospitals will be under pressure from two sides: Increasing costs on the one hand, and less financial resources on the other. The conflicts between hospital management and health insurances, outlined in chapter 4.4 will therefore probably further intensify. Against this backdrop, a solution for this problem without additional financial resources seems unrealistic (Augurzky et al., 2014, pp. 195-196). Even if it is assumed that hospitals will be able to increase their operating efficiency in the future, these improvements cannot be realized without the necessary means (Viering & Söhnle, 2010, p. 6). The success of private hospitals has shown that a solid capital basis and a good access to financial resources is a valuable factor for long-term profitability.

The "crunch question", however, will be: How is this going to be financed? The Federal States have not met their statutory obligation within the dual hospital financing system so far. Given the scarcity of public funds and the debt brake it can be expected that this in not going to change (Goldschmidt & Gürkan, 2013, p. 340). Generally, there are many arguments in favour and against a dualistic and a monistic financing system. Hospital C (2014) emphasizes that none of both system is better than the other. The crucial point, however, is the amount of money, which is provided. Regarding this, the dual financing model is no longer suitable in its present form. Since hospitals currently finance their shortfall in investment subsidies out of their operating income, there is already a creeping monistic financing on the way, however, without a corresponding
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statutory framework. This development might be dangerous for the sector because of several reasons. First, and most importantly, hospitals are endangered to not have sufficient funds to invest. This is particularly threatening when considering that investments in the current hospital environment are probably more important than ever due to the described demographic development, medical-technical progress and the shortage of skilled professionals. Moreover, the DRG-Introduction has increased new demand for investments due to required structural changes such as the need for co-operations or the increase of outpatient treatment (Rong, 2013, p. 355). Nonetheless, even those hospitals, which receive sufficient public subsidies oftentimes have become depended on such public grants. In such a case, a reliable and forward-looking planning of investments might still be difficult. Secondly, the separation of the responsibilities for hospital planning and the responsibility for the financing of investments, which has shifted to the hospitals and therefore to health insurances prohibits measures that are painful, but economically efficient (Klein-Hitpaß et al., 2014, p. 257). Thirdly, within the dual financing system, essential business decisions cannot be taken from a single party (DIHK, 2010, p. 4). Rürup (2008) argues that the missing possibility for hospitals to individually plan and negotiate the financing of investments and continuous operations impairs its profitability. Therefore, a complete abolition of the dual hospital financing could be target-aimed approach.

A definite step towards a monistic financing has been avoided by the legislator up to now. However, a convergence towards a monistic hospital financing has already taken place on state level. The probably best-known case of an implementation of a regional monistic in Germany is Northrhine-Westphalia which was the first state that replaced the combined system of individual and lump-sum subsidies through a system that is exclusively based on performance oriented lump-sum subsidies ("Invesitionspauschale") (Rong & Schlüchtermann, 2009, p. 13). The subsidies are now paid either as a lump-sum for constructions ("Baupauschale") or as an annual lump-sum. The lump-sum for constructions replaces the individual subsidies and comprises funds for new construction, rebuilding, and extensions including the replacement of noncurrent assets (Rong & Schlüchtermann, 2009, p. 13). The annual lump-sums substitute the old lump-sum subsidies. They are paid for the replacement of short-term assets. The amount of both subsidies are calculated based on the performance data such
as case mix, LOS, supplementary payments and cost for education (Rong & Schlüchtermann, 2009, pp. 13-14). According to a survey of Rong and Schlüchtermann (2009) two years after the new regulations were introduced, the majority of the interviewed hospitals and planning authorities stated that the new system had contributed to an improved transparency, a higher degree of autonomy, more fairness and better planning security.

An important argument against a system change refers to the protection of sparsely populated areas (Kampe & Bächstädt, 2007, p. 30). Similar to the discussion about emergency supplies, it is often argued that hospitals in rural areas have less inpatient cases. As a result, a funding mechanism like in Northrhine-Westphalia would disadvantage those hospitals. In order to protect hospitals and patients in such rural areas a redistribution of resources could serve as a solution ensuring stability and planning security. Rürup (2008) for example suggests that a certain percentage of fiscal revenues (e.g. 10 %) for subsidies could be retained in an investment fund and then be paid out to structural disadvantaged hospitals.

Nonetheless, even though a well-designed monistic system can provide clear rules for the funding of capital investments, the system itself cannot solve the problems of a financing gap. This view is also confirmed by the hospitals and planning authorities interviewed in Northrhine-Westphalia, as 76 % of them did not expect the introduction of the regional monistic to help reducing the current investment bottleneck (Rong & Schlüchtermann, 2009, p. 15). Against this backdrop, it can be assumed that in the future, hospitals will be in demand more than ever to adopt alternative financing solutions as a supplementary source of funding. Even though it is much more difficult for public and independent charitable hospitals to raise capital compared to private players, Rong (2013) holds that there are options to adopt new sources of internal and external financing. As one of the first public hospitals for example, the University Hospital of Schleswig-Holstein carries out infrastructure projects with the means of a public-private partnership (PPP) (Rong, 2013, p. 356). Generally, such PPPs are partnerships between the public and the private sector, in which a private partner is integrated into a new form of organization and financing. Both partners agree on a long-term contractually regulated co-operation, which creates mutual dependency while the
public influence on decision-making remains preserved (Rong & Schlüchtermann, 2009, p. 27). For those sponsors of a hospital, which are not able to mobilize additional resources, the inclusion of additional shareholders could be a valuable alternative. Through this, for example municipal hospitals could sell minority interests to investors or private hospitals. According to Rong (2013), this method has already been successfully applied by Sana Kliniken AG and the Hospital of Duisburg. Nevertheless, since shareholders or partners are not altruistic and demand adequate returns, these alternative sources of financing can only serve as a compliment to a well-functioning hospital funding system. Considering the expected structural developments explained at the beginning of this chapter, it is evident that besides a reorganization of the system and alternative ways of financing, more capital will be necessary to overcome the upcoming challenges. If those resources are to be financed through public tax funds or increased health insurance contributions is rather a topic of political relevance. However, in order to avoid that indispensable structural optimizations cannot be initiated due to lacking investment resources, timely action is recommended. At the latest in the mid 2020s, there will be no way around a social debate about how much a strong corporative covered health care system is worth to us.
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