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**Working Paper**

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ECIPE Working Paper, No. 05/2011

**Provided in Cooperation with:**

European Centre for International Political Economy (ECIPE), Brussels

*Suggested Citation:* Erixon, Fredrik; Van der Marel, Erik (2011) : What is driving the rise in health care expenditures? An inquiry into the nature and causes of the cost disease, ECIPE Working Paper, No. 05/2011, European Centre for International Political Economy (ECIPE), Brussels

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ECIPE WORKING PAPER • No. 05/2011

# WHAT IS DRIVING THE RISE IN HEALTH CARE EXPENDITURES? An Inquiry into the Nature and Causes of the Cost Disease

By Fredrik Erixon and Erik van der Marel

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## ABSTRACT

The last 40 years have seen a rapid increase of government expenditures on public welfare arrangements. Increasing healthcare expenditures form a significant part of these outlays, and its share of total government expenditure has risen rapidly. This paper argues that the determinants of growth in healthcare expenditure are partly to be found in the way healthcare is organised. As economist William Baumol noted already in the 1960s, personalized services can easily fall into a stagnation trap characterized by rapidly increasing cost inflation. Healthcare today shows clear signs of being a “stagnant personal service” with poor productivity levels compared to other services such as telecommunication. As a result, healthcare inflation is far higher than the standard inflation rate, creating high real costs that push up the expenditure for healthcare. Consequently, we argue for reforms in the organisation of healthcare provisions to reduce the sector’s productivity lags in European countries and to reap the benefits that emanates from integration with other markets.



**JEL Code:** I11, I12, I18, H51

**Keywords:** healthcare, inflation, Baumol’s disease, trade in services



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## 1. INTRODUCTION

EUROPE, LIKE EVERY other developed region, has experienced a rapid expansion of public health-care expenditures in the last 50 years. This expansion, along with the general rise of the welfare state, has lately been subject to a charged and increasingly Manichean ideological debate, with some seeing the public system of healthcare as an epitome of civilization while others have portrayed it as socialism or opposed it on the grounds of general welfare-state inefficiency.

Yet regardless of one's ideological outlook, there are plenty of reasons to be worried about the future financing of healthcare. There is a consensus among economists that most of the Western European countries today run healthcare systems that simply cannot be financed in future. Moreover, that future may not be far away. Generally, Europe will in the next ten years be occupied by consolidating its fiscal balances and debt levels. Even if crisis-related measures and developments are discounted, Europe is approaching frightening levels of public debt. According to a recent projection by the European Commission, public debt may add up to 120 percent of GDP in the EU at the end of this decade.<sup>1</sup> That development alone would have depressing effects on all sorts of government expenditures.

As the rise in expenditures will be even faster when the baby-boom generation soon reaches healthcare-dependent ages, every account of future health-care financing makes sober reading.<sup>2</sup> In Europe, and other mature developed societies with entrenched models for healthcare financing (e.g. the United States), there is an urgent need to find ways to use resources more efficiently, and new sources to finance increasing healthcare demands, to accommodate increases in healthcare demand.

Or to put the same observation in the stark terms of economists Lawrence Kotlikoff and Christian Hagist: "No country can spend an ever-rising share of its output on health care, indefinitely. There is a limit to how much a government can extract from the young to accommodate the old. When that limit is reached, governments go broke."<sup>3</sup>

This paper aims at examining what economist P P Barros once called the "black box" of determinants of healthcare expenditures<sup>4</sup> – in particular those determinants mostly responsible for current and future increases in expenditures. In particular, we are interested to learn why these determinants are driving costs and if the composition of expenditure growth is yet another reason to be worried about the financing needs of Europe's healthcare systems.

The paper starts from the assumption that rising health-care expenditures is a natural phenomenon reflecting increasing income and ensuing changes in preferences. Hence, we are not concerned with increasing demand *per se*. It is rather the cost drivers on the supply side we aim to study. It would be natural to assume that increasing demand and cost drivers are one and the same – just two different ways of expressing the same phenomenon: *healthcare costs have increased because of increasing demand*. That, however, is not necessarily the case, and it does certainly not serve as a plausible explanation for all increases in healthcare expenditure.

Much of the debate over the supply-side effects of healthcare expenditures has been focused on elements of *new* or *additional* treatments. New medical technologies, treatments and medicines, for example, can create additional healthcare expenditures, especially if they, for one reason or

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another, do not substitute or lower existing costs.<sup>5</sup> However, it is not a realistic proposition that these new or additional expenditures explain the major part in the overall rise in healthcare costs. Public expenditures for medicines, for instance, have had a stable relative share of total healthcare expenditures in OECD countries in the past decades (see the Annex). In fact, pharmaceutical expenditures, in relative terms, have declined from its levels in 1970, despite rapidly increasing total public healthcare expenditures in the following 15 years. It is true that medical innovations like CT scanners have contributed to increased expenditures in healthcare, yet the overall trend in investment levels and growth in healthcare does not add up to the levels showed for overall expenditure growth for healthcare. Furthermore, when the costs of specific parts in healthcare production are compared between countries, there is a remarkable difference between countries of similar development level and degree of capital input in healthcare production.<sup>6</sup> This suggests that there are other factors of importance in determining the cost of healthcare.

This study discusses another potential driver of cost, namely productivity (or lack thereof) in European healthcare systems. Behind the rise in healthcare expenditures is an expansion of what can be called “current services spending”, which comprises the organization (including labour) and infrastructure of healthcare delivery. As this service element is arguably a strong determinant of increasing healthcare costs, we will particularly examine healthcare spending in that context.

It is of interest from two perspectives. Firstly, increasing costs for labour and constant inefficiencies in the organisation of healthcare production push overall expenditures of healthcare. Secondly, the way production of healthcare is organized affects the productivity effect of investments in new technology and innovation. Preferably, a higher capital share in the production will increase productivity, partly by substituting labour and old technology, partly by making production more efficient. But this is not necessarily the case with investments in any sector, and it seems safe to say that healthcare have shown particularly small effects on productivity by investments.

This service component of healthcare warrants more discerning analysis. As economist William Baumol discovered in his seminal work on the so-called “Baumol’s cost disease”, healthcare can be viewed as a “stagnant sector” (showing lagging productivity levels) because of the strong labour and staff element in the composition of healthcare costs. Baumol used the example of a Beethoven string quartet to illustrate this disease: while the productivity of a Beethoven performance has not increased (it takes the same number of musicians and the same time to perform a Beethoven symphony) the salary of musicians, the main cost of this service, has increased with the general trend of wage growth. Hence, the real unit cost of the service has increased, especially relative to other sectors in the economy with positive and high productivity growth.

Furthermore, for a sector with “Baumol-disease characteristics”, like healthcare, it is not enough that revenues follow the general trend of GDP growth; tax revenues for healthcare rather need to increase above the general GDP trend to cover the increasing costs from the disease. Our analysis confirms Baumol’s prediction: there are clear trends of lagging productivity levels and higher real cost of healthcare for the European countries we have studied.<sup>7</sup>

Low productivity growth is often a function of the non-tradability of a service; there are few products/sectors with low or falling productivity that at the same time are exposed to international competition and are parts of an international division of labour. Some services are tradable – integrated with world markets – while others are not. Healthcare service is largely a non-tradable sector. It is integrated with world markets in some aspects on the input side, but the service output is in most countries detached from world markets. Hence, local costs development and local prices are disconnected from world market prices, or prices in other significant markets or geographical regions.

Yet increasing elements of health-care services have grown more tradable. Technological progress, like teleradiology, and increased mobility of labor and capital have fostered greater interests for cross-border healthcare services, although still only at the margin.<sup>8</sup> But the potential for trade – and from reaping the benefits from trade – has increased considerably in the past years and will increasingly do so in the near future. Consequently, this paper argues for a closer world-market integration of healthcare services as a method to increase resource efficiency.

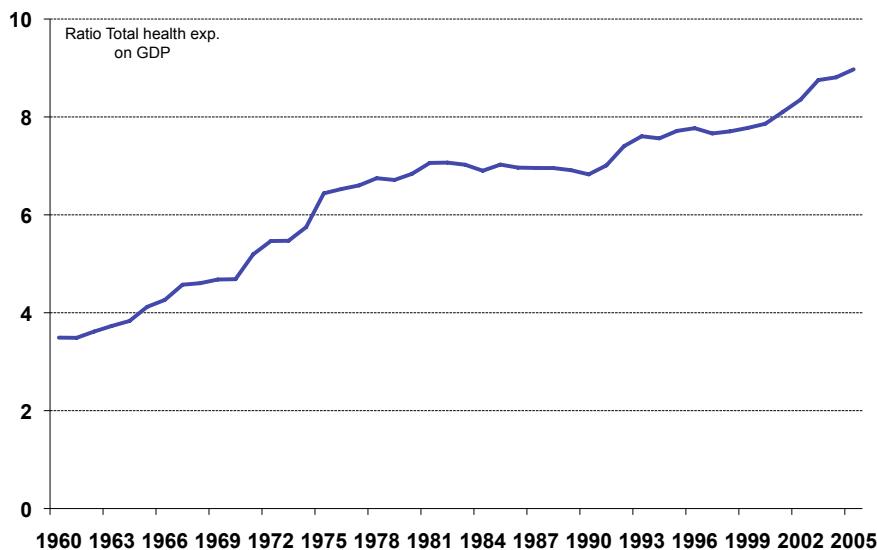
## 2. DEMYSTIFYING HEALTHCARE EXPENDITURES<sup>9</sup>

THERE IS SURPRISINGLY little research on the determinants of expenditure growth in the health-care sector. For many decades it was assumed that the correlation between GDP-per-capita levels and per-capita healthcare expenditures, which is very significant, was the only interesting relation as far as expenditure growth was concerned.<sup>10</sup> When countries grew richer, healthcare expenditures went up. In the past decade there has been a much stronger interest in understanding healthcare expenditures beyond expansion of GDP and welfare. Yet it is fair to say that this research is still in its infancy, lacking in particular reliable data to conduct quantitative research. We do not intend to approach all issues of interest, but in order to understand the cost-disease problem and how it can be mitigated this paper will also touch upon some of the related issues.

Let us start by examining the overall development of healthcare expenditures in Europe. Unsurprisingly, healthcare expenditures have been rising persistently across all industrialized countries since the 1960s. European Union (EU-15) healthcare expenditures per capita in absolute terms have been rising steadily, showing no indication that these expenditures will stabilize, let alone decrease, in the near future. According to the OECD Health Data, per-capita expenditure on healthcare have been increasing on average from 171 US\$ PPP per capita in 1970 to 3090 US\$ PPP per capita in 2006.

Over the same period income per capita has increased considerably, too, allowing for a natural and income-related gradual expansion of expenditures. Yet income growth has not been able to cover all rising expenditures. Healthcare expenditures as share of national income (GDP) have been growing substantially as well (see Figure 1), with the exception of a disruption of the trend in the early 1980s. In 2005, healthcare expenditure on average constituted 9.2 per cent of total national income in EU-15.

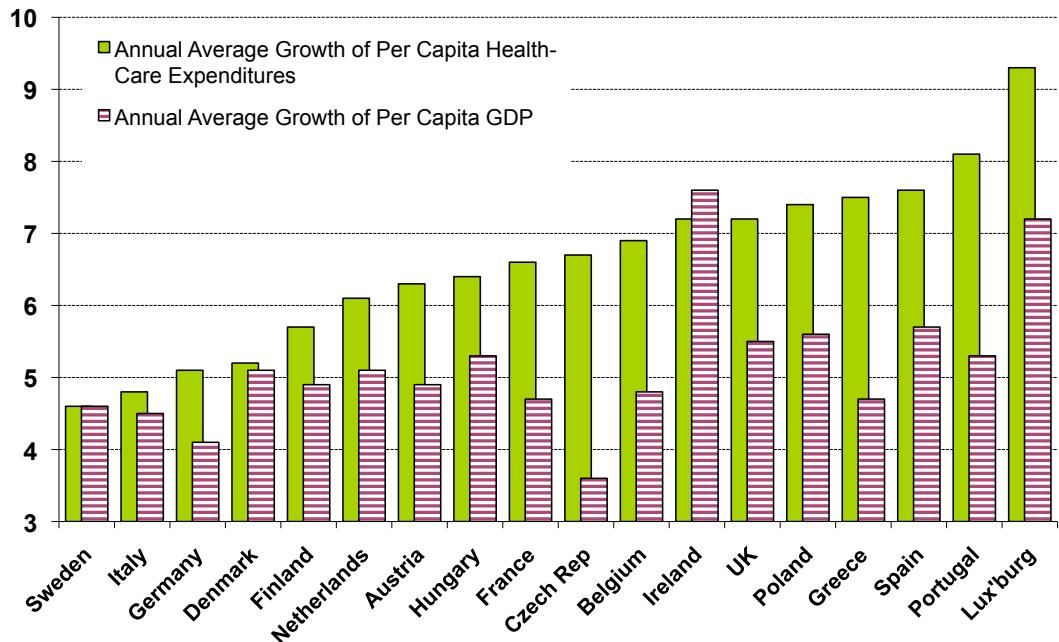
**FIGURE 1: EU-18 TOTAL EXPENDITURE ON HEALTH AS PART OF GDP (1960-2005) IN PPP**



Source: OECD Health Data; own calculations.

The overall development holds true also when aggregate data is decomposed on individual countries. As shown in Figure 2, which covers the 35-year period from 1960 to 2005, the annual average growth rate of per-capita healthcare expenditures is far higher than the annual average growth rate of per-capita GDP in most countries. This lag in GDP growth rates holds true for almost all countries, except Ireland and Sweden. Furthermore, the figure shows that countries such as Portugal, Spain and Greece have systematically higher healthcare expenditure growth rates than other countries while GDP per-capita growth in these countries has remained on an average level.

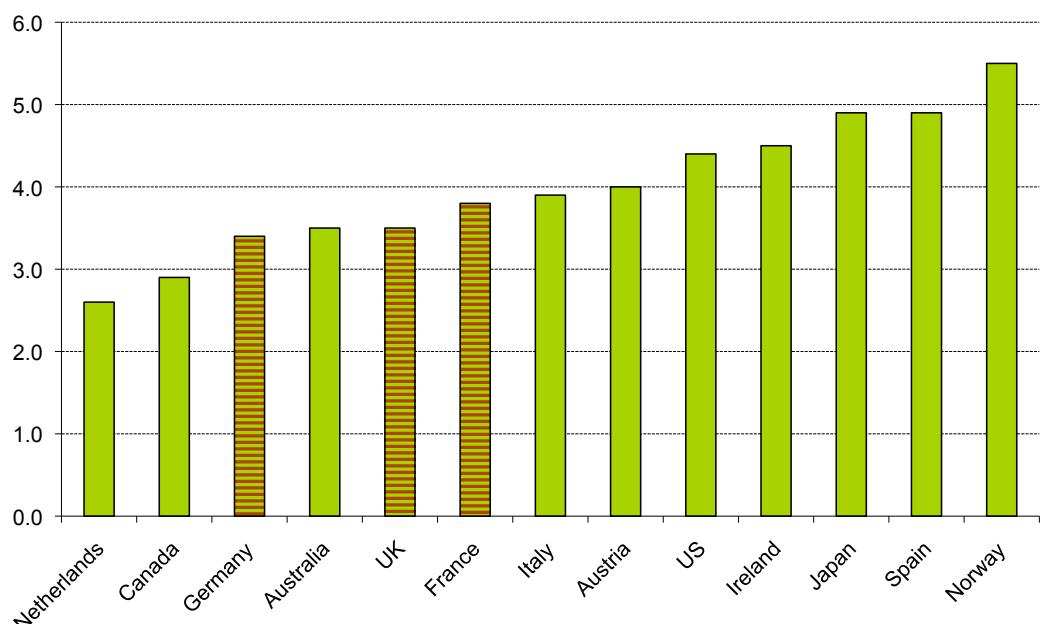
**FIGURE 2: ANNUAL AVERAGE GROWTH OF PER CAPITA HEALTH EXPENDITURE.**



Source: OECD Health Data; own calculations.

Healthcare expenditures have been growing considerably for the last 35 years also in *real* terms. Corrected for inflation, the real per-capita expenditure on healthcare has been growing around 4 per cent since 1970. Figure 3 shows that some countries, like Spain and Ireland, go beyond this rate, while others, like the Netherlands, are on the lower side of the sample. Spain and Norway have experienced a growth rate around 5-6 percent. The Netherlands and Canada have “only” expanded real healthcare expenditures by 2.5 percent per year.

**FIGURE 3: ANNUAL AVERAGE GROWTH OF REAL PER CAPITAL HEALTH CARE EXPENDITURES (1970-2005)**



Source: OECD Health Data 2008, own calculations.

Furthermore, healthcare as share of total government expenditure has also increased over the past decades. According to OECD data, the share of public (current) expenditure on health in EU-15 averaged exactly 15 per cent of total government outlays in 2005.<sup>11</sup> This pattern of rising costs of healthcare as a share of total government outlays is most likely to continue. Even if governments take measures to mitigate pressures on increased healthcare expenditures, their share of total government expenditures will go up.

## 2.1. France, Germany, Sweden and the UK

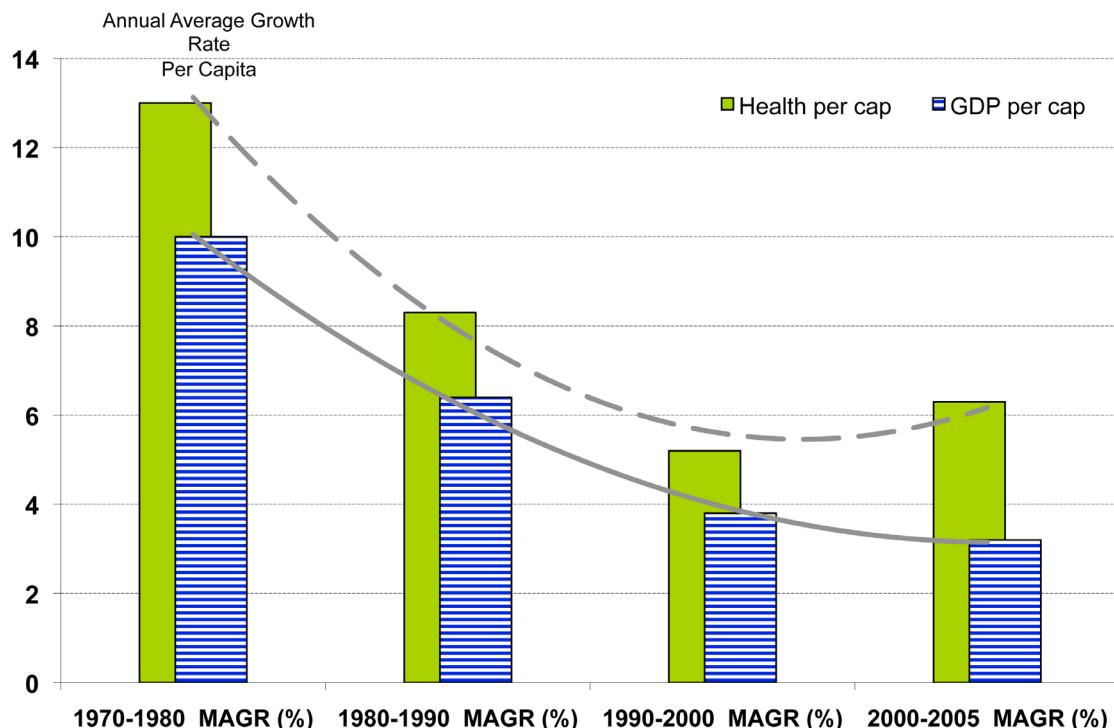
A COMPARATIVE ANALYSIS of France, Germany, Sweden and the United Kingdom gives us a better view on the development of healthcare expenditures. Comparing annual average growth rates for both healthcare expenditures per capita and GDP per capita, we see that all four countries' growth in healthcare expenditures have been declining in since the boom years up to the 1970s. However, they rose again from 2000 onwards, despite this period being one characterized by GDP income levels that are falling behind or show a decreasing growth rate. But there are differences, too, between the countries. Some of them are significant. Let us look closer at each country.

### *France*

ECONOMIC GROWTH IN France slowed in the 1990s and the first half of 2000s. Growth in healthcare expenditures was on par with economic growth in the 1990s, but in the Noughties there was a sharp increase in the expenditure growth rate. Over the whole period from 1970 to the mid-2000s, annual average growth of health care expenditures per person was significantly higher than that of the national income per person. Growth in healthcare expenditures was 1-2 percentage units higher than economic growth. Such a development over more than thirty years significantly affects the relative share of healthcare in total government expenditures; a clearly increasing share of French public spending has been allotted to healthcare.

On a more general level, both expenditures and income have been declining since 1970. Where the first decade still shows a per-capita growth rate of around 10 per cent, this rate fell to approximately 6 per cent in the subsequent decade. In all decades per-capita GDP growth rate has been lagging behind quite substantively. In fact, the period from 2000 to 2005 shows that the health care expenditures have morphed into a higher rate again while the income level is declining towards a lower growth rate. France already has one of the highest ratios of healthcare spending in the OECD region, and despite some reforms in recent years to curtail the growth trend, the share of GDP spent on healthcare is estimated to increase quite significantly in the next two decades.

**FIGURE 4: FRANCE – ANNUAL AVERAGE GROWTH RATE PER CAPITA HEALTH EXPENDITURE & PER CAPITA GDP FOR FRANCE**



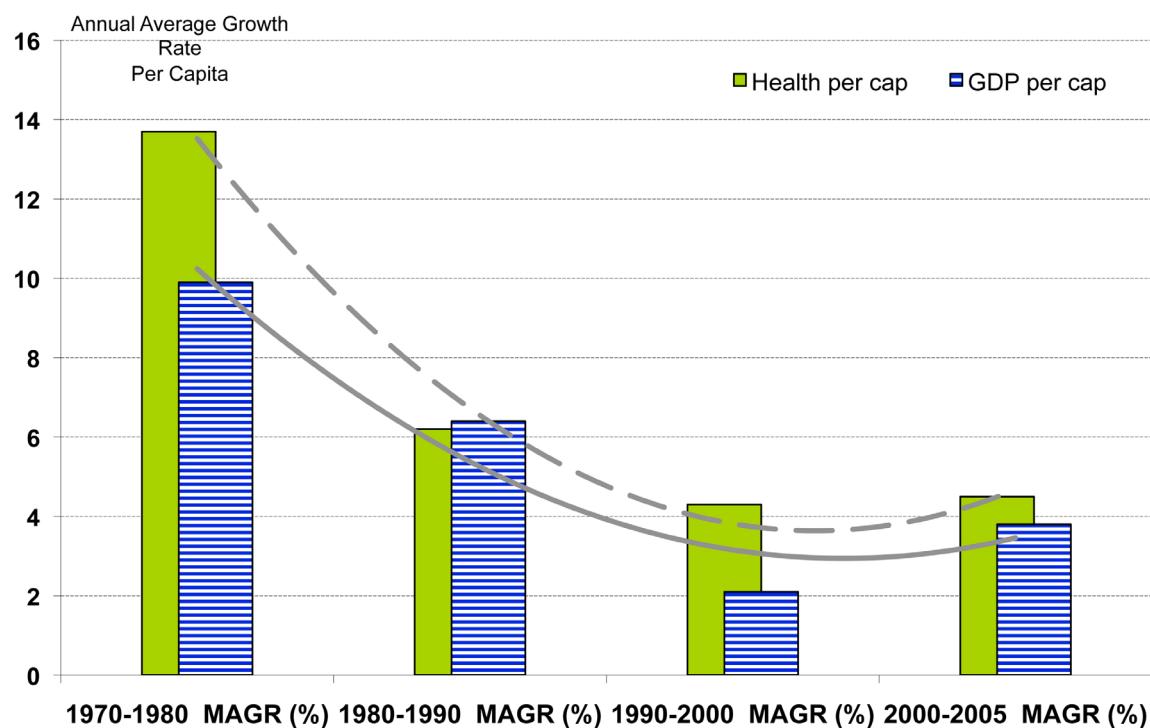
Source: OECD Health Data 2008, own calculations.

### *Germany*

GERMANY SHOWS A less worrying historic trend (a trend, however, which is likely to change in future as Germany faces strong pressures on healthcare expenditures due to its ageing population). In the first decade of the analysis below (Figure 5), Germany's per-capita healthcare expenditures growth was quite substantive while its per-capita GDP growth rate was much lower. From 1980 onwards Germany's growth rate for health expenditures decreased significantly, allowing expansion to largely be financed by the general rise in income levels. However, the growth rate in Germany's healthcare expenditures has been increasing since the 2000s, although not to the same extent as in France. GDP per-capita growth has been declining in the long term, but increased in the period up to the financial crisis in 2007-09, enabling Germany to again finance a greater part of its expansion of healthcare expenditures by economic growth.

**FIGURE 5: GERMANY – ANNUAL AVERAGE GROWTH IN GDP AND HEALTH EXPENDITURES**

Source: OECD Health Data 2008, own calculations.

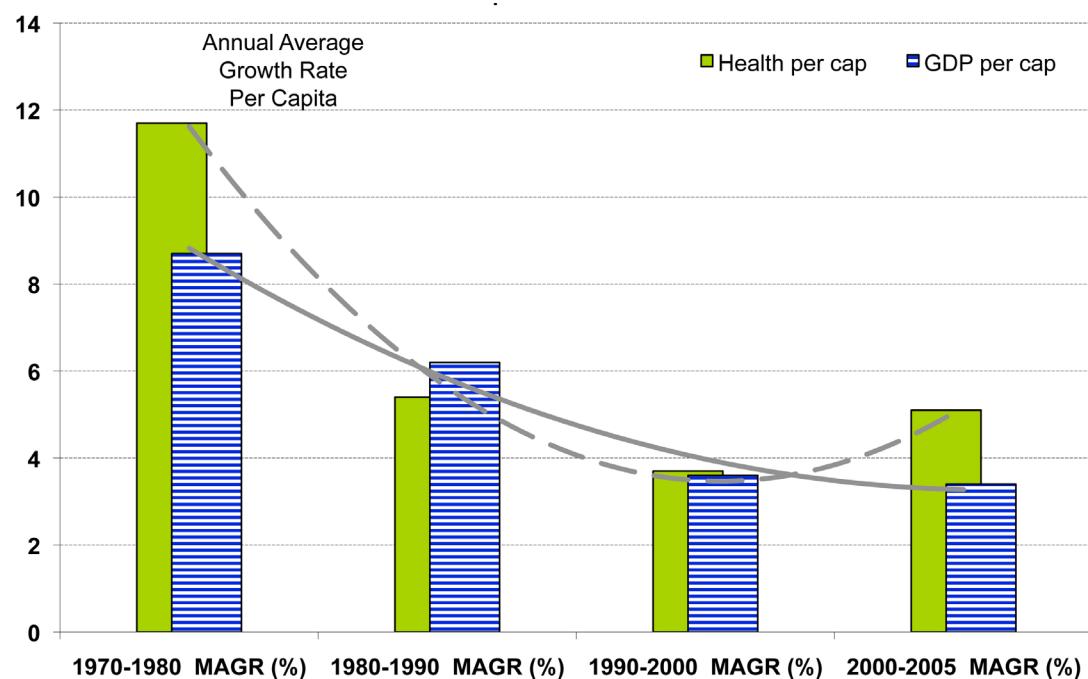


### Sweden

SWEDEN SHOWS A somewhat different development than France and Germany. Its growth rate for per-capita healthcare expenditure was largely greater than the growth rate for per capita income in the first period in the analysis. In the two following decades, however, Sweden's annual economic growth rate exceeded or was equivalent to its growth rates in health care expenditures. Nonetheless, Sweden's policy could obviously not reverse this positive trend as its healthcare expenditures growth rate is increasing again at the same time as its growth rate in GDP remains constant – a difference of approximately almost 2 percentage units. Sweden, hence, has not had as strong pressures over time on increasing the share of healthcare expenditures in GDP as other countries. No doubt that share has increased. It will also continue to increase in the next few decades. Yet also future pressures are likely to remain less expansionary than in France and Germany.

FIGURE 6: SWEDEN – ANNUAL AVERAGE GROWTH IN GDP AND HEALTH EXPENDITURES

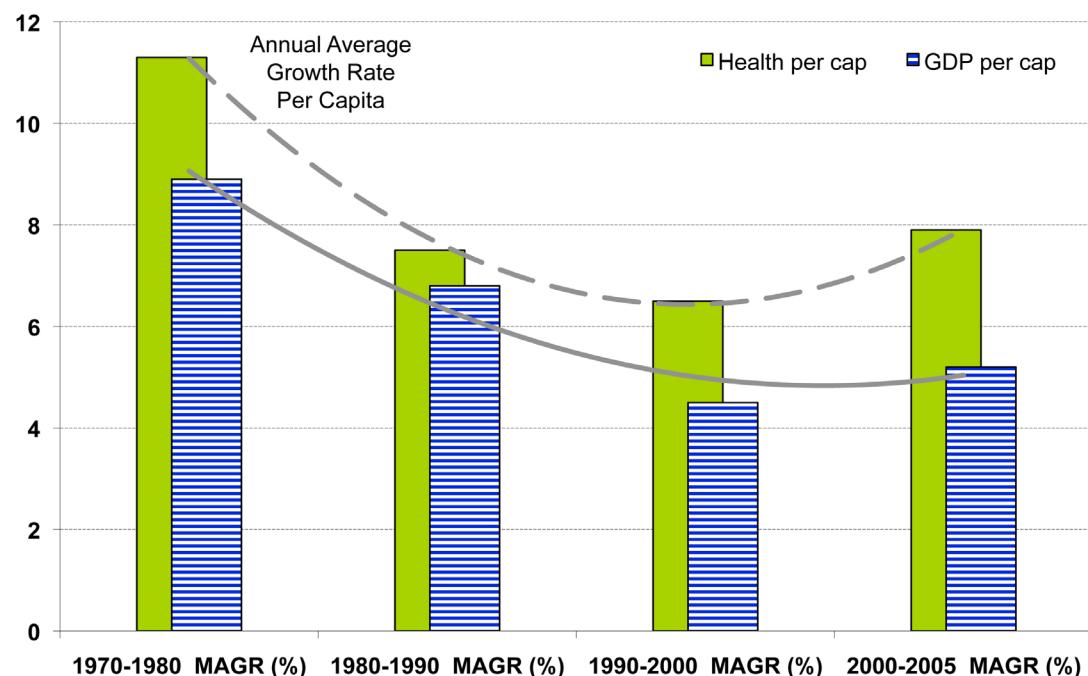
Source: OECD Health Data 2008, own calculations.



### United Kingdom

The United Kingdom largely follows the trend of all other countries, especially France. In all examined periods, the growth rate of per-capita GDP has been lower than the growth rate of per-capita health expenditures. On the other hand, the UK's GDP growth increased again in the first half of the 2000s, but its healthcare expenditures exceeded GDP growth. Moreover, the gap between the two growth rates has been increasing substantially since the early 1990s. In the years leading up to the financial crisis, UK growth in per-capita healthcare expenditures was 2.5 percentage points higher than the equivalent rate of economic growth. Furthermore, the UK's *level* of health expenditures growth is the highest among the other three countries. Consequently, the UK is facing a steep rise in future healthcare spending if expenditure growth is maintained.

FIGURE 7: UNITED KINGDOM – ANNUAL AVERAGE GROWTH IN GDP AND HEALTH EXPENDITURES



Source: OECD Health Data 2008, own calculations.

In sum, all countries show a decreasing trend of growth for health expenditures since the 1970 up to 2000. In the new millennium, the growth rates of health expenditures have again been increasing, a trend that is in line with the overall development in healthcare expenditure throughout Europe (see Annex 1). The UK has the highest rate of growth of around 8 per cent whilst Germany shows the lowest growth rate for health expenditure, just below 5 per cent. In contrast to this pattern, mean average GDP growth rates largely follow the same pattern but at a much lower rate. The most worrisome signals come from Sweden, France and the UK where the gap between the two growth rates have been further increasing in recent years. Long-term forecasts, however, suggest Germany to have the fastest rise in healthcare expenditures, especially after 2025.

### 3. DECOMPOSING HEALTHCARE EXPENDITURES

THE AGGREGATED TRENDS presented in the previous chapter are not surprising. Nor do they give all necessary information to understand cost drivers in healthcare expenditures. Let us now turn to disaggregated data and examine if the general trends of healthcare inflation are to be found in selective areas of healthcare production.

So the question is: what expenditures are behind the general rise in healthcare expenditures in the past decades? Does the rise predominantly accrue to specific parts of healthcare production – or is the increase largely equal in all or most parts of the healthcare production chain? The response to this question is an important guide for policymakers wishing to control expenditures and expenditure growth by increasing resource efficiency. In other words: is cost inflation a specific or general problem in the healthcare sector?

If the political debate in the past years is an indicator, there is already an answer. The debate has focused almost exclusively on new and additional spending, with spending on new pharmaceuticals often seen as the main culprit. Consequently, measures to contain costs have been focused at new and additional spending: spending that requires a new positive policy decision rather than spending that just continues from one year to another unless there is a negative decision to disrupt spending.

Yet it is highly improbable that pharmaceuticals would be a significant driver of cost in healthcare for the simple reason that its share of total spending is not significant enough to spur big expansion in aggregate spending. In fact, expenditures on pharmaceuticals do not show an extraordinary expansion that would suggest a disproportionate increase in demand for medicines to the overall increase in healthcare expenditure. Since 1970 pharmaceuticals take up a 15-percent share of healthcare expenditure and growth is in line with the overall growth of healthcare sector outlay. In other words, that share has not changed much in the past decades (see Annex for data). Clearly, medicines do not constitute a major part of health care expenditure and broadly follows the overall trend of rising healthcare costs.

A more adequate question is: what explains cost increases in the other 85 percent of the general health care expenditures? The greatest share of expenditures in healthcare is represented by the organisation of its service delivery. The organisation of healthcare service delivery is a strong denominator not only for costs in general, but probably also for expenditure growth. Personal healthcare expenditures, which are composed of medical services, medical goods, pharmaceuticals, medical durables and non-durables, takes up the lion's share of total health care expenditures – around 90 per cent. The remaining 10 percent is represented by collective healthcare and total healthcare investment.<sup>12</sup> In other words, the costs for the organization of healthcare *service delivery*, stripped of expenditures for pharmaceuticals, represent approximately 72 percent of total health-

care expenditures within EU-15.<sup>13</sup> To illustrate the structure of expenditures in healthcare, tables 1 and 2 provide a historical composition of healthcare expenditures for Germany and France since 1970. Naturally, a part of healthcare that takes up more than two thirds of total expenditure is also likely to be one of the significant cost drivers.

**TABLES 1 AND 2: SUBCATEGORIES OF PERSONAL HEALTHCARE EXPENDITURES AS PERCENTAGE OF TOTAL HEALTHCARE EXPENDITURE**

Germany	1970	1980	1990	2000	2005
Tot.exp. medical services - % total exp. on health	63,2	67,5	66,2	69,2	67,9
Tot. exp. in-patient care - % total exp. on health	30,8	33,2	34,7	35,5	34,8
Total exp. on day care - % total exp. on health	-	-	-	0,6	0,8
Tot.exp. out-patient care - % total exp. on health	31,9	33,4	30,4	22,7	22
Tot. exp. home health care - % total exp. on health	0	0,1	0,3	6,1	5,9
Tot. exp. ancillary serv. - % total exp. on health	0,4	0,8	0,7	4,4	4,5
Total exp. medical goods - % total exp. on health	18,3	17,9	19,4	18,4	19,4
Tot. exp. pharm. & other - % total exp. on health	16,2	13,4	14,3	13,6	15,2
Tot. exp. on thera. appl. - % total exp. on health	2,2	4,5	5,2	4,8	4,3
France					
	1970	1980	1990	2000	2005
Tot.exp. medical services - % total exp. on health	66,4	74,5	73,4	65,3	67,1
Tot. exp. in-patient care - % total exp. on health	40,2	49,4	44,3	35,7	42,4
Total exp. on day care - % total exp. on health	0,4	0,9	1,4	4,5	-
Tot.exp. out-patient care - % total exp. on health	23,1	21,1	23,7	21,4	20
Tot. exp. home hlth care - % total exp. on health	0,1	0,2	0,3	0,4	1,2
Tot. exp. ancillary serv. - % total exp. on health	2,6	3	3,8	3,4	3,5
Total exp. medical goods - % total exp. on health	26,7	18,5	20,1	21,2	20,9
Tot. exp. pharm. & other - % total exp. on health	23,8	16	16,9	18,2	16,4
Tot. exp. on thera. appl. - % total exp. on health	2,8	2,5	3,2	3	4,5

Source: OECD Health Data 2007, own calculations.

One should be careful not to draw any far-reaching conclusions on the basis of these tables. Yet the tables show that neither Germany nor France has experienced a disproportionate increase of expenditures for total medical services as a share of total health expenditure. Germany's expenditure on total medical services increased modestly in the 1970s but has remained stable since 1980. France's expenditures on total medical services has been somewhat decreasing, but over the entire period these expenditures have stabilized since the 1970s.

Expenditures on in-patient services largely show a similar pattern. These expenditures, as part of total healthcare expenditures, have increased only moderately for Germany and remained relatively constant since 1990. Moreover, from 2000 to 2005 the share of in-patient service expenditures in Germany has been decreasing from 35.5 percent to 34.8 percent. In-patient expenditures in France have decreased from 44.3 per cent in 1990 to 35.7 percent in 2000, although this figure has gone up lately up to 42.4 percent in 2005.

However, this data on total medical and in-patient expenditures for Germany and France has not

significantly increased. It rather shows that both types of expenditures have followed the overall trend of a total healthcare-expenditures increase.

Data from the OECD allows us also to examine health expenditures by selected providers on an aggregate level. It would be useful to see whether the trend of expenditures by hospitals is consistent with our analysis of expenditures on in-patient services. The data for both France and Germany since 1990 substantiates our earlier analysis that costs of healthcare services provision are rising gradually in line with the overall increase health expenditures. Germany shows a stable share of 29 per cent and France has a comparable rate of 33.3 per cent, as shown in Annex 3.

Analyzing other parts of personal health expenditures gives rather mixed result. Out-patient services as part of total expenditures show a declining rate for both Germany and France. Other services, such as day care and ancillary services, show a diverse outcome among the two countries. Whereas in Germany both home care and ancillary care have been increasing since 2000, home care in France has remained stable and ancillary care was already high in the 1970s. However, day care in France has been rising fast since 2000. These differences presumably reflect different measurements and categorizations of expenditures and must be considered in relation to an ageing society in both countries. But these parts of health expenditures form two sub-categories of total medical services expenditures that have shown a stable increasing pattern over time and cannot be held responsible for any big increase. Nor does total medical service expenditure take up an ever increasing portion of the total health budget.

Decomposing total healthcare expenditures, therefore, does not give us a clear point of direction on what caused their steady increase. In fact, no particular component can be blamed for a sharp increase of total healthcare costs and no specific subcategory of expenditures. Over the last 35 years, the bulk of the expenditures on healthcare is represented by services provision and it occupies a stable share of total health expenditure. This steadily rising trend is in line with the ever increasing level of the government outlay on healthcare. Focusing on expenditures, therefore, does not provide the principle source of why healthcare has become so expensive and rather seems to be an unfruitful way to gauge the determinants of health expenditures. Studies that have focused on the rise of healthcare expenditures as such do not give a conclusive answer and therefore do not tell much. In our view these studies overlook the structural problem inherent in current healthcare systems. This is where we turn next.

#### 4. HEALTHCARE AS A SERVICE

THE LITERATURE ON health economics rarely examines the most elementary part of healthcare: the fact that healthcare is a service with its own accompanying economic characteristics. These characteristics can eventually have major macro-economic impacts. The fact that healthcare is a service, and a service which operates under very specific conditions, could arguably explain the growing level of healthcare expenditures. The link is subtle and not always visible, but it is central in order to understand why expenditures are rising.

Health economists analyzing the determinants of increasing healthcare expenditure often aim to uncover the link between the healthcare expenditure growth rates with the level of GDP. Although no causal relationship can be deducted from this connection, it is true that a correlation between these two variables exists. As economies get richer their consumption pattern tend to move disproportionately more to services, including healthcare services. It is thus rather natural that richer countries spend relatively more money on health, and if financed by the state, it would give an obvious explanation why health expenditures are rising.

Other explanations that have been studied are, for example, population shares above certain age thresholds, or differently put: ‘proximity to death’.<sup>14</sup> These explanations search for cost-driving factors on the demand-side of the healthcare sector. However, the results are mixed and many economists in that bracket have been frustrated by the absence of compelling evidence to support that thesis as explanation to the rising healthcare costs at an aggregated level.<sup>15</sup> Demand is undoubtedly rising and creates therefore additional healthcare costs, but demand cannot alone explain the large share of medical services expenditure. Other forces that lie outside the health demand and supply framework, and deal with the services component of health, must be further explored to understand the determinants of rising healthcare expenditures.

### Productive and Less Productive Services

SERVICES ARE DIFFERENT from goods in several ways: they are often intangible, invisible and non-storable, requiring production and consumption at the same time.<sup>16</sup> Services are also very heterogeneous and do not always share similar features. These unique features cause services to have different levels of productivity during their unique production process. This is also reflected in the price of a service.

This notion of different productivity patterns had already been discovered by Baumol when he developed a theory in which the economy is divided into two sectors: a progressive sector that show high rates of labor productivity and a stagnant sector that suffers from a productivity lag showing lower levels of labor productivity.<sup>17</sup> Generally, manufacturing and agriculture are areas that belong to the productive sectors of the economy whereas some services, because of their nature, show lagging or negative productivity rates, causing them to suffer from a so-called “cost-disease structure”.<sup>18</sup>

This is a simplified view of the services sector. Yet Baumol’s paradigm serves as a good starting point for an analysis of different markets and sectors. In Baumol’s model the manufacturing sector shows high productivity levels thanks to investments in equipment that can improve the production process. Technology substitutes labour-intensive processes and will reduce the real costs of a good or service. However, this technology progression is not applicable for some services as their labour-intensive nature shields the service from deep technology penetration, partly as a strategy to preserve quality. As a result these service sectors show relative productivity rates that are lower compared to other sectors in the economy – a direct consequence of their labour intensiveness.

Services such as healthcare and education are still very labour intensive and are difficult, let alone impossible, to standardize. When, for instance, labour in the healthcare sector is replaced it could become detrimental to the quality of the service, i.e. to the patient who is in need of specific treatment. Direct personal contact during the production and consumption of a healthcare service is often key. Healthcare is therefore often referred to as a personal service which will always require a constant amount of labour time.

Even if Baumol’s approach is crude it points to the central role of productivity. Our own calculations on labour productivity levels confirm Baumol’s distinction of productive (progressive) and unproductive (stagnant) sectors. Table 3 presents ten years of productivity growth in three different sectors. In addition to the healthcare sector we have also included other sectors where higher productivity rates would be expected.<sup>19</sup> Data is taken from the Eurostat database on economic indicators and employment. The Eurostat database provides employment data broken down in 31 sectors from agriculture and fisheries to typical manufacturing and services sectors. The Eurostat database does, however, not give detailed numbers for medical care, which prevents us from calculating sub-categories of the healthcare sector, such as the hospital sector. The data in

table 3 gives, however, a good indication on the healthcare sector's productivity rates compared to other and more productive sectors in many European countries. The annual average labour productivity growth rates are calculated for a period of 5 years, each using gross added value (or gross product) divided by the sector's total hours worked. Not all countries are included as data for the missing countries was not available.

**TABLE 3: GROWTH RATE LABOUR PRODUCTIVITY PER HOUR (INCLUDED GROSS ADDED VALUE OR GROSS PRODUCT)**

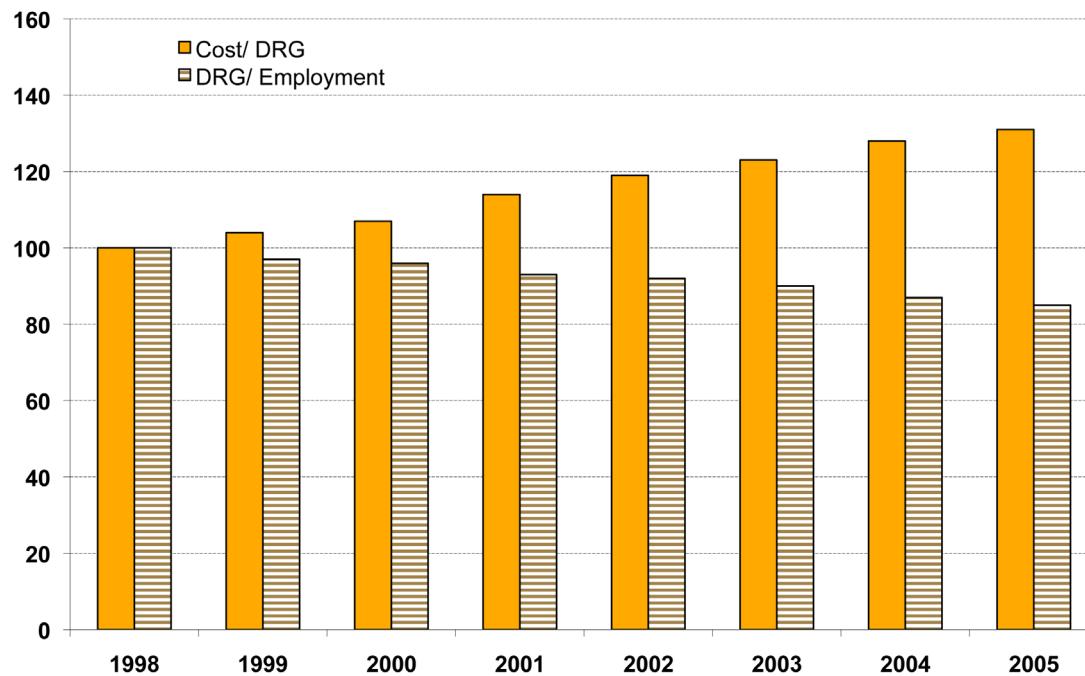
Period	Manufacturing		Transport & Comm'cation		Health services	
	95-00	00-05	95-00	00-05	95-00	00-05
Bulgaria	-	-	3,7	1,7	1,3	0,1
Czech Repu-blic	1,3	2,0	-0,2	1,7	-1,9	0,5
Denmark	1,5	8,9	4,5	7,2	0,8	0,0
Germany	5,8	5,5	6,2	5,5	2,9	1,8
Estonia	3,9	1,9	6,8	3,1	3,0	-0,6
Greece	-	3,5	-	10,4	-	2,9
Spain	1,0	1,8	-	0,6	-	-0,4
France	7,4	6,8	-	5,1	-	1,3
Italy	1,7	-0,1	3,6	3,0	1,1	1,0
Cyprus	1,8	1,0	3,8	5,6	-0,2	0,3
Lithuania	1,4	2,3	1,4	3,8	0,8	0,1
Hungary	5,5	2,1	5,5	1,9	3,9	0,4
Netherlands	5,4	5,9	-	-	-	-
Austria	8,9	4,8	2,5	3,0	0,1	-0,1
Poland	6,0	2,6	-	-	-	-
Slovakia	1,4	3,9	0,4	1,7	0,5	0,7
Finland	10,7	12,4	8,9	6,8	-0,5	-2,1
Sweden	10,5	13,7	6,1	6,5	-0,4	0,6
Norway	2,5	9,5	5,8	6,4	0,9	0,8

Source: authors own calculations based on data from Eurostat

A few things stand out in this table. First, productivity growth rates for manufacturing are in both periods higher than those for the transport and communication sector. In contrast, the transport and communication service sector shows in turn higher labour productivity growth rates than the healthcare sector. Indeed, some countries even show a negative productivity growth rate for their healthcare sector. Second, productivity growth rates for both transport and communication and health services seem to be higher or as high in countries with a lower level of economic development. This is, however, not surprising and confirms the theory that services in countries with a lower level of GDP have a relative price structure that is more competitive due to lower wages.<sup>20</sup>

Data of sub-categories of healthcare are hard to obtain. Yet, healthcare contains sub-sectors that are more sensitive to labour substitution than others. Intuitively, one would think that capital investments and new technologies in the hospital sector opens for labour substitution to a greater degree than in, for example, elderly care. Data from Sweden, a typically developed country, rejects this suggestion and shows in fact that its hospital sector's productivity is declining since 1980, whereas its real costs (adjusted by an indexed CPI deflator) are increasing. Although technological improvements are certainly present in the hospital sector, they do not necessarily contribute to direct labor substitution.

FIGURE 8: LABOR PRODUCTIVITY AND COSTS FOR HOSPITAL SERVICES IN SWEDEN.



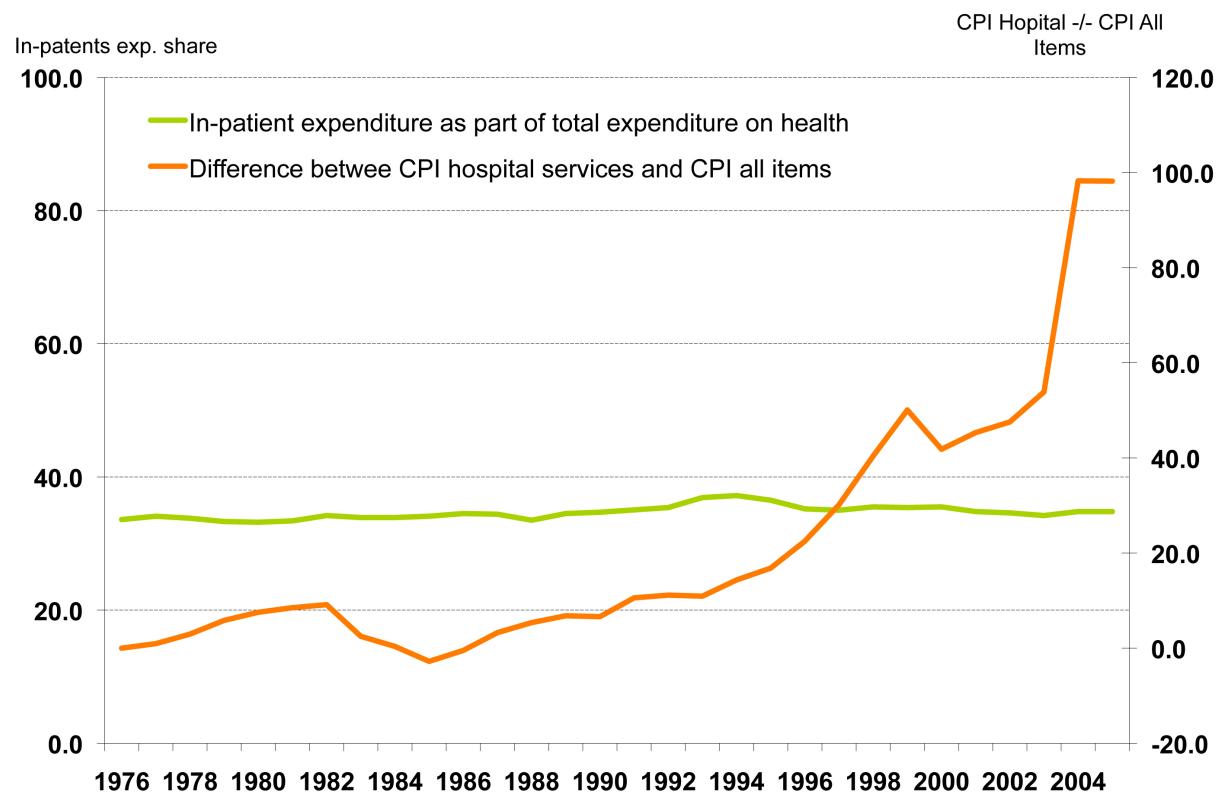
Source: Own calculations based on data from Swedish Association of Local Authorities and Regions.

### The Real Cost of a Healthcare Service

LAGGING RELATIVE PRODUCTIVITY in personal services is reflected in the cost of those services. In other words, production of a personal service generates a higher unit cost compared to other services and goods. However, what matters here is that growth rates of these unit costs of a personal service are persistently higher relative to the growth rate of the overall cost increase of all sectors in an economy, i.e. the average inflation rate. This process of higher inflation rate for stagnant sectors creates ever increasing *real* costs for the service as such. It appears, as Baumol pointed out, that most government services suffer from these accumulating real costs. A practical consequence of this observation is that expenditure for these services has to go up every year in order to maintain the level of production in the previous year.

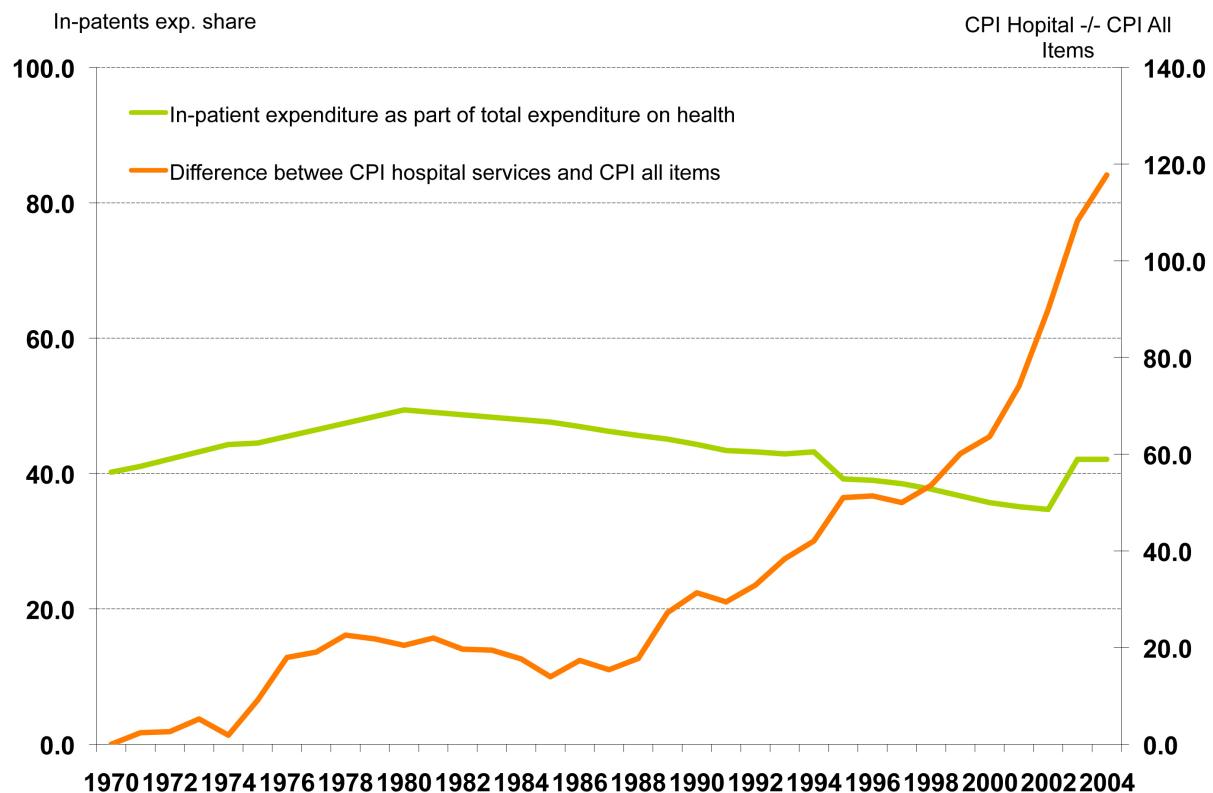
Data on healthcare services prices in Germany and France confirms this pattern of increasing real cost by showing a price growth that is much higher than the consumer price index for both countries (see figures 6 and 7). The lines in each of the graphs, which are measured on the right-hand side, show the real price increase of the overall hospital services sectors. The second line in each graph, which is measured on the left-hand side, illustrates once again the constant share of expenditures of in-patient health services. Our calculations go back to 1970 where the index has been neutralized to zero. The result clearly shows that the growth rate of hospital service have increased faster than the average annual inflation rate resulting in a constant growth of real cost for German and French hospital services.

FIGURE 9: REAL HOSPITAL PRICE INCREASE IN GERMANY



Source: OECD Health Data 2007 and national statistical offices, own calculations.

FIGURE 10: REAL HOSPITAL PRICE INCREASE IN FRANCE



Source: OECD Health Data 2007 and national statistical offices, own calculations.

Other graphs, using different variables, for France, Germany, Sweden and the UK substantiate our findings of considerably increasing real prices, as shown in Annex 4. All figures show that sub-categories of the healthcare sector also suffer from a price growth that is far higher than the growth level of the average inflation rate.

In France the average inflation rate is far behind the price increase of a general physician. However, when compared to prices of a typical French hospital bed the increase of physician prices is actually relatively modest. This pattern of increasing real costs for hospital beds and physicians is in line with the growth rate of real prices for French hospital services.

Germany shows a similar pattern of increasing real health services costs. While data is more recent for Germany (see Annex 4), it nevertheless shows growing rates of growth for health service prices that are far higher than the German consumer price index. Medical staff prices in Germany or the price of a German hospital bed also exhibit growth rates that have been increasing much faster than the overall German inflation rate.

Similar developments are found in other European countries examined for this paper. Both Sweden and the UK have had substantially higher growth rates of healthcare services prices than the growth rate of inflation. In the UK, the growth of prices for hospital services takes up an increase that is even much higher than other sub-categories of healthcare. The results for Sweden show a somewhat mixed result.

In sum, most data on medical services prices shows a trend in healthcare inflation which is far above standard consumer price indexes. These higher growth rates of prices, however, should not be confused with higher price levels. One can clearly observe that healthcare prices persistently grow much more rapidly every year than other goods and services.<sup>21</sup> These higher prices reflect the accumulation of real costs of a healthcare service, which in turn is an indirect consequence of lower productivity growth compared to other and progressive sectors.

Hence, we are now starting to zoom in on an oft-neglected cost driver in healthcare. The service delivery of healthcare has shown persistently high inflation rates. In a healthcare sector where the healthcare service itself represents the bulk of healthcare expenditures, such inflation is likely to be of central importance for the understanding of why healthcare costs are increasing as much as they do.

### Explanations of Higher Health Prices and the Cost-Structure of Health

WHY IS HEALTHCARE inflation so much higher than general inflation? Higher healthcare inflation has often provoked people to blame pharmaceuticals and the earnings of physicians. Although it sounds reasonable to think that the high wage increases in a labour-intensive sector is ultimately to be blamed for at least a substantial share of high health expenditure, this accusation has proven false. Earnings of physicians have in reality not increased remarkably in the past decades, at least not in Europe. And if they have increased somewhat higher than the average inflation rate, they would still not be a significant component in healthcare inflation. Let us look at France to exemplify why. The real growth rate (adjusted for inflation) of French specialists' wages have only increased 1.6 percent on average per year between 1990 and 2005. Comparing this increase with the equivalent rise in US earnings, for instance, French wage increases seem modest. The real wage for specialists in the US increased by 2.8 percent.<sup>22</sup> Moreover, the 1.6 percentage annual increase in that time period could impossibly cover for the steady rise of total personal healthcare expenditure that in real terms has increased with a 4.8 percent annual average over the same period.

Demand-side pressures on expenditures are growing, too, and as countries get richer demand for health is proportionately growing faster than demand for other goods and services.<sup>23</sup> This rationale is often validated with arguments of an ageing population. Other forces of demand also play a role. Patients today act more as consumers and demand access to healthcare that strains budgets in traditionally rationed healthcare models. Yet these demand-side arguments do not seem convincing from an economic point of view. It is a common fact that a higher level of economic development creates increased demand for particular services. Healthcare is not an exception. When demand rises, prices, as with all goods and services in an economy, go up. If demand is maintained at higher levels, supply tends to increase too. Yet such market dynamics do not seem to at play in the healthcare sector.

The link between higher healthcare service prices and increasing health expenditures is more subtle. As discussed above, stagnant services sectors experience lower productivity growth compared to other progressive sectors, which eventually drives up the price of such a service caused by an increase of their *real* costs. Other sectors have labour-substituting alternatives that can augment their productivity rates, creating eventually higher real wages. However, stagnant sectors are not susceptible to such a development. Unintentionally, a personal service cannot experience an increase in output per labour unit as the labor intensiveness of the service will always be more or less constant. This stagnation of productivity causes the sector to have downward pressures on wages, but in response to rising real salaries in the more progressive sectors nominal wages in the stagnant health sector tend to rise, too. If not it would be unattractive to work be employed in the healthcare sector.

Baumol exemplified his problem with the performance of a Beethoven string quartet. An orchestra performance of Beethoven 100 years ago required as much time and labour as if it would be played today. Therefore, its output per worker in labour time remains constant over time. In monetary terms, labour productivity will shrink. Output per worker in other and progressive sectors in the economy has increased. It requires less labour input to produce a car today than 20 years ago. While increased output per worker in a progressive automobile sector occurs thanks to technology investments, the string quartet cannot substitute the actual performance with technology: a better violin will not speed up the performance. Still, the wages of that string quartet will have to follow the more productive sectors in order to attract talented people.

Again, this is a crude version of reality. Importantly, it is also in several respects a false portrait of economic limits in personal services. A string quartet, for instance, can expand output per worker by e.g. increasing the audience, recording the performance, or use other alternatives to increase revenues per performance. However, Baumol points to a real problem in the healthcare sector.

Generally, the real wages for the progressive sectors increase, but those of the stagnant sectors remain constant, or decrease, as a consequence of their different productivity growth. If increased wages are matched by an increase in productivity, the unit cost of labor remains unchanged.<sup>24</sup> Stagnant sectors do not experience the same productivity growth, yet their nominal wages are being matched with the overall inflation rate of an economy, just as in other sectors. As a result, the unit cost of labor for the stagnant sector rises, which creates a real cost relative to progressive sectors. Arguably, these explanations of the Baumol's cost disease structure for stagnant sectors explain, to a large extent, the underlying causes of higher costs for healthcare.<sup>25</sup>

## Productivity at Work: Is Healthcare Completely Immune?

AN EARLY ASSUMPTION in Baumol's work on cost disease was the complete impossibility of pro-

ductivity enhancements due to technological improvements. As Baumol later explained, such an assumption is evidently false. Hardly any good or service today is entirely immune to the overwhelming technological improvements that have been taking place in the past century. Just as manufacturing and agriculture have undergone huge technological improvements, impersonal services such as transport, telecommunications and other business services have become much more productive over the years.<sup>26</sup> These services are often used as inputs in final goods or services. Healthcare as such is an input for the development of an economy overall, but remains a final good when consumed. The consumption of healthcare can, in most cases, not be homogenized like other personal services. Yet improvements in the production process of a health service can nonetheless be obtained. It means that even one of the most stagnant sectors can experience technology-induced productivity gains.

There are also a few other complicating factors which aggravate the Baumol disease problem in the healthcare sector and increase the difficulty of creating increased productivity through investments in technology. One of these factors is that the healthcare sector shows problems of so-called x-inefficiency – an inefficiency created in the overall organisation of healthcare production and financing. It has been known for a long time that the structure of healthcare financing – public and private – is associated with information problems as patients generally cannot make judgments about the decisions favoured by professional medical staff. Furthermore, the involvement of third parties in financing healthcare adds an extra layer of information problems and generally incentivizes a development towards a greater degree of centralization in the healthcare sector.

It is also not far-fetched to think that public organisation of healthcare service production has structural inefficiency problems. Admittedly, it is difficult to draw any firm conclusions about the efficiency of various healthcare providers. Many of the private actors in European healthcare are foundations or universities that do not run hospitals with a profit motive. They tend to suffer from some of the structural problems that are found in public healthcare entities. Yet recent experiences with organizational reforms of hospitals and primary healthcare centres, including privatization, have shown some encouraging results on the productivity of healthcare. Sweden is one of the countries where the results are the strongest. Improvements have largely come through increased utilization of capital (increased use of expensive medical-technology equipment) and general management and organizational reforms that have improved work process and work satisfaction. Similar results have been found in e.g. the United Kingdom and Spain.

Another structural problem is the barriers built up between local and global prices in the healthcare sectors. To put it in different terms, the healthcare service sector is remarkably autarkic in its organisation and there are few attempts to integrate healthcare services markets in the world in order to gain from the international division of labour and specialization. This area is where we turn next.

### Services Trade: An Option for Healthcare?

MOST TRADABLE SECTORS have experienced in the last few decades an enormous increase in productivity rates thanks to technological progress in combination with the creation of global supply chains in which massive imports and exports of inputs have created competitive prices for many final products. In addition, world market integration through reduced cross-border barriers has also fostered much stiffer competition between final products. The possibility of cross-border trade opens new ways to invest or import technology, products and services elsewhere, creating increased living standards by improving productivity. Progressive sectors such as manufacturing and some impersonal services have experienced tremendous productivity increases in the past decades.

Sectors with low productivity growth tend to be sectors with smaller world-market integration. This is especially of so-called non-tradable sectors – that is, sectors or products that hardly feature any cross-border trade at all. There can be several explanations to why a sector is non-tradable. Many non-tradable service sectors often do not have the possibility of cross-border exchange because they are by nature locally biased. Hairdresser, restaurant servers and other non-tradable services are unlikely to be exchanged across borders and are rather bound to be produced and consumed locally.

How do healthcare services fit in this larger context? The answer is that healthcare services operate as non-tradable services but that a big part can benefit quite substantially from using the possibilities of increased trade and cross-border integration.<sup>27</sup> These benefits can be generated both on the import and the export side. Import gains are obvious: using labour from countries with lower labour costs. This is already true for production of many inputs to the healthcare sector, e.g. medical technology. It is also increasingly often that parts of the healthcare service are subject to import gains: x-rays or lab tests performed abroad. Countries that do not compete with low labour costs could also generate export gains, predominantly through specialization in healthcare services production requiring high technology-intensity and specialised skills. The increasing mobility in society more generally are also opening up for gains for trade in healthcare. Patients can get fairly simple treatments abroad by travelling to another healthcare entity. For routine treatments such as dental care, general healthcare check-ups, or cosmetic surgery cross-border integration is already expanding. Another vector is immigration and temporary movement of labour. Healthcare in Sweden and the United Kingdom, for instance, already have a high degree of foreign-born labour in their staff. An expansion of these patterns will reduce x-inefficiency and generally increased resource efficiency in the healthcare sector.

Yet there is also a stronger link to the specific problem discussed in this paper: the cost-disease problem aggravated by low technology-induced productivity growth. Expanding trade in healthcare will enable healthcare units to increase capital efficiency. It will also incentivize healthcare operators to increase the capital-investment ratio more generally, partly because it is necessary for some trade, partly because the yields on investments can increase by expanding patient target groups and by lowering the operational costs for investments.

However, to enable greater trade there will have to be reforms of the way that healthcare systems operate. Traditionally, European healthcare systems are organized along national lines and have as a result become locked inside their own borders. National regulation and insurance schemes, for instance, prevent people from importing healthcare services on a larger scale. Hence, healthcare services currently imported are typically paid out-of-pocket or made possible by special arrangements between the national health insurances and their contracted foreign suppliers. This hinders an efficient allocation of resources – of healthcare expenditures. It also aggravates the cost-disease structure in healthcare.

Such regulation on imported health services is politically understandable. Like other sectors, the healthcare sector would not initially welcome increasing competition. In addition, increasing competition is often seen as difficult to marry with the ambition to maintain healthcare as part of the welfare state. That may or may not be true; we believe the latter. Export, however, is likely to be favourably viewed by the healthcare sector. The benefits from exporting is, politically, often more straightforward. Developed countries with access to sophisticated medical technology will find it attractive to export advanced medical services.<sup>28</sup> Almost all European countries today have a highly developed health care sector that once it will open for trade will likely to meet higher international demand.

Yet the important point now is related to how an expansion of healthcare should be made possible. It is hence a growing market – indeed a rapidly growing market – that is at the centre of this discussion. And it is unlikely that a rapidly growing market would have a depressing effect on the existing structures and volumes of healthcare. Furthermore, it is inevitable that one casualty in future healthcare expansion will be labour costs unless there are ways to increase labour productivity. Cross-border integration that increases productivity could hence contribute positively to wages in the healthcare sector. That is the trend in progressive sectors, and there is no particular reason to why positive productivity developments in healthcare should not be reflected in wages.

## 5. CONCLUDING REMARKS

MOST INDUSTRIALIZED COUNTRIES are facing increasing fiscal problems with the steady rise of healthcare expenditures. Not only nominal healthcare expenditures are rising; healthcare also takes an ever increasing share of GDP and government outlays.<sup>29</sup> If policies are not changed, countries like Germany can expect healthcare expenditures to represent more than 20 percent of GDP 15 or 20 years from now. Even if other countries are not facing such a stark increase, problems are big enough to warrant close examination of why healthcare costs are increasing and how healthcare can use resources more efficiently in future. That, however, is not what policymakers are interested in doing. In the past years, the big strategy has been to contain healthcare expenditure increases in order to make healthcare affordable for governments. Policy makers with a so-called cost-containment outlook are rather enthused by the idea of curtailing expenditure growth by rationing models that do not sacrifice the quality of healthcare service delivery.<sup>30</sup>

That strategy will not be sustainable. Cost-containment can only achieve marginal effects, especially if such policies continue along current lines by addressing new and additional healthcare spending rather than the bulk of total spending represented by delivery of healthcare services. What government rather should do is to address inefficiencies in the healthcare sector. That would not only help to contain cost increases; it would also enable the healthcare sector to improve its competitiveness and to sustain its growth.

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## ENDNOTES

1. European Commission (2009).
2. See e.g. OECD (2010) for estimates on future growth of healthcare expenditures.
3. Kotlikoff & Hagist (2007).
4. Barros (1998).
5. Newhouse (1992).
6. See e.g. Koechlin, Lorenzoni & Schreyer (2010).
7. Other studies have reached similar conclusions, e.g. Hartwig (2006).
8. Herman (2008).
9. We are using pre-crisis data in this paper to avoid any crisis-related effects in the data.
10. Gerdtham & Jönsson (2000).
11. This figure is excluding the Netherlands. It includes as well the investment or gross capital formation in the health sector. When only taking the current health expenditure for 2005, this figure constitutes 14.5 per cent of the general government's total outlays. Total expenditure on personal health and total expenditure on collective health form together the total current expenditure. Current health expenditure and investment in health together form the total health expenditure. Investments excludes education and training of health personnel, research and development, food, hygiene and drinking water control, environmental health, administration and provision of social services in kind to assist living disease and impairment and administration and provision of health related cash-benefits.
12. Collective healthcare is services such as prevention and public health services and health administration and health insurance whilst total health investment makes up the total gross capital formation in healthcare.
13. Total medical services are the sum of in-patient services, day care, out-patient services, home care and ancillary care. Generally, in-patient care reflects hospital care where a patient's visit lasts longer than one day whereas out-patient care is usually care that is provided by clinics where patients pay a one-day visit.
14. See Hartwig (2006) for an extensive literature overview on what variables might cause increasing health expenditures.
15. Roberts (1999) and Gerdtham and Jönsson (2000).
16. Copeland and Mattoo (2005)
17. See Baumol (1967). These two sectors, in fact, are framed within a neo-classical economy where the progressive sector roughly covers manufacturing or other productive services sectors such as telecommunication whereas stagnant sectors are those sectors that deliver a personal service.
18. Note that not all services show lagging productivity figures. See Triplett and Bosworth (2007) for further analysis on this point. They show with American data that quite some services now show higher labour productivity rates and greater total factor productivity. However, a specific reference to health is excluded from their research as the authors only calculate data for a broad definition of personal services.
19. However, data for healthcare should be interpreted with care as it represents the healthcare sector as a whole, which is true also for other sectors in table 3.
20. See, for example, Krevis, Heston and Summers (1982) and Bhagwati (1984)
21. The provision of healthcare by national governments cause healthcare prices to have grown at a lower pace than for instance in the United States where the health sector is less centralised. Furthermore, some authors such as Triplett, Bosworth and Brant state that another price index should be taken that better reflects health output today in terms of unbudgetary outcomes in health, i.e. quality, subjective feelings of the patient etc. However, Baumol (2007) rejects such an assumption stating that what economically counts in his theory is financial cost patterns of health service delivery.
22. Data only permits us to analyze France and the United States. Other countries show no data or only have data for several years which prevents us to draw any general conclusions for on this point.
23. This implies that health care is a superior (or a luxury) good: its income elasticity of demand for health

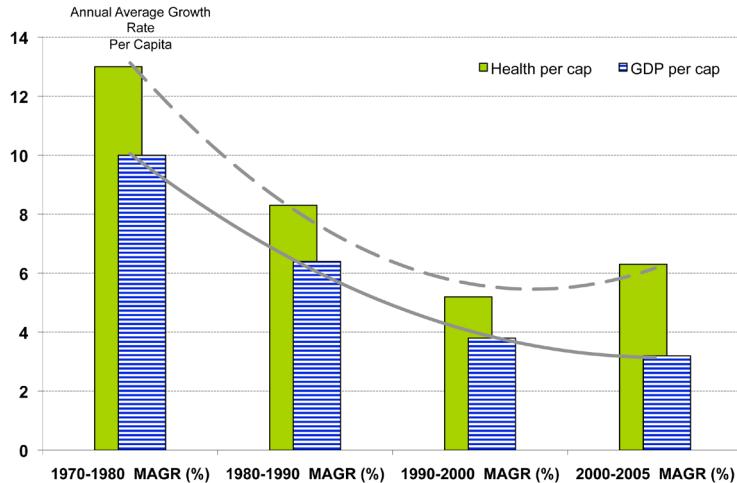
services is greater than 1. Moreover, as Baumol (2007) states, this natural tendency of consuming more services in an economy would even aggravate the cost disease structure as more employees will be necessary to meet growing demand in the health sector.

24. Baumol (1996)
25. See Hartwig (2006) and (2007) for empirical studies on the link between higher expenditure and the Baumol disease.
26. These are the so-called input services which Oulton (1996) refers to. The author states that these input services have become a sector on its own, pushing up productivity rates, which seem to falsify Baumol's theory. However, and in the longer term, if productivity rates in final demand services are still lower than productivity rates in manufacturing, Baumol's argument will still prove to be valid (Hoekman and Mattoo, 2008). See also Triplett and Bosworth (2003).
27. Herman (2008) and Bhagwati (2008).
28. Copeland and Mattoo (2008)
29. See Busse (2001) for further analysis of rising healthcare expenditure as part of GDP.
30. Erixon and Davis (2008)

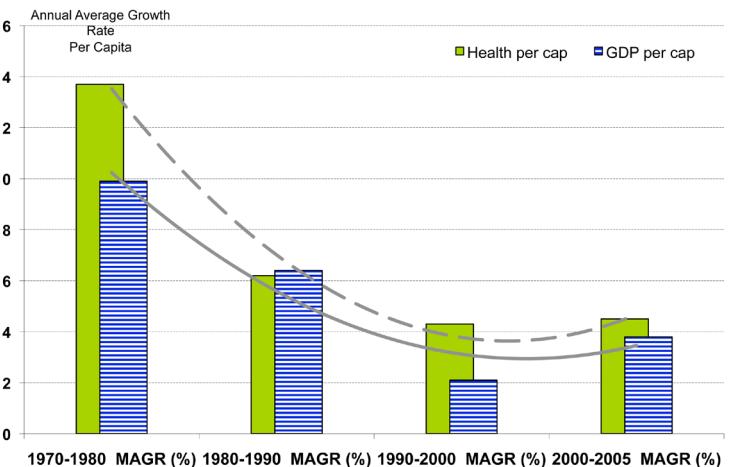
## FIGURES ANNEX

### Annex 1:

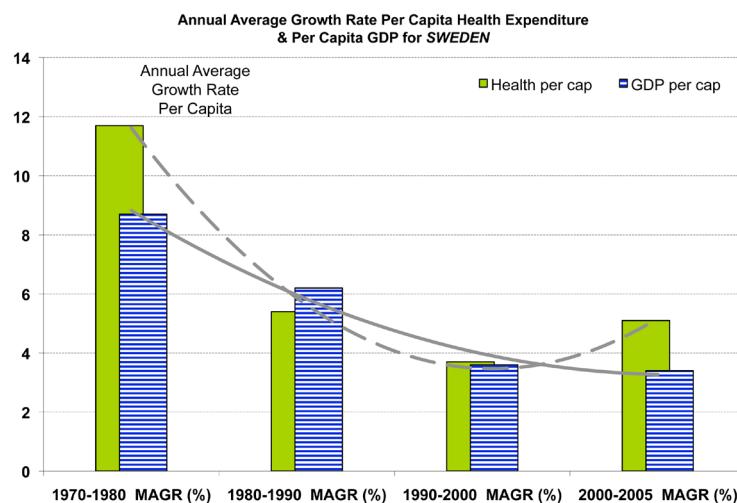
#### FRANCE – ANNUAL AVERAGE GROWTH RATE PER CAPITA HEALTH EXPENDITURE & PER CAPITA GDP FOR FRANCE



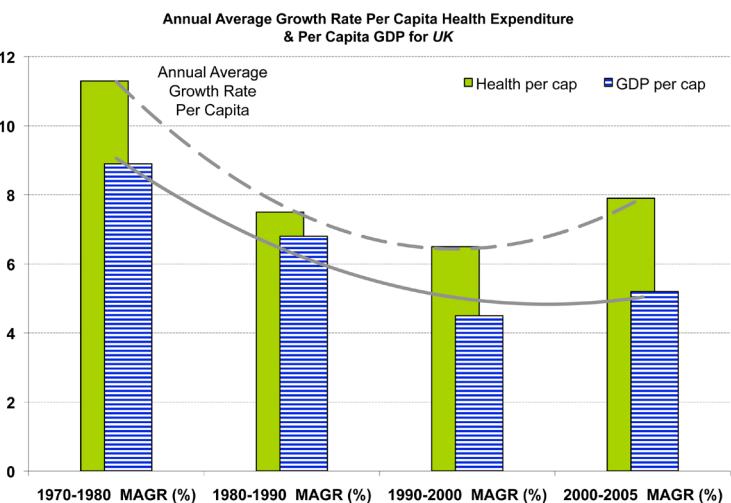
#### GERMANY – ANNUAL AVERAGE GROWTH IN GDP AND HEALTH EXPENDITURES



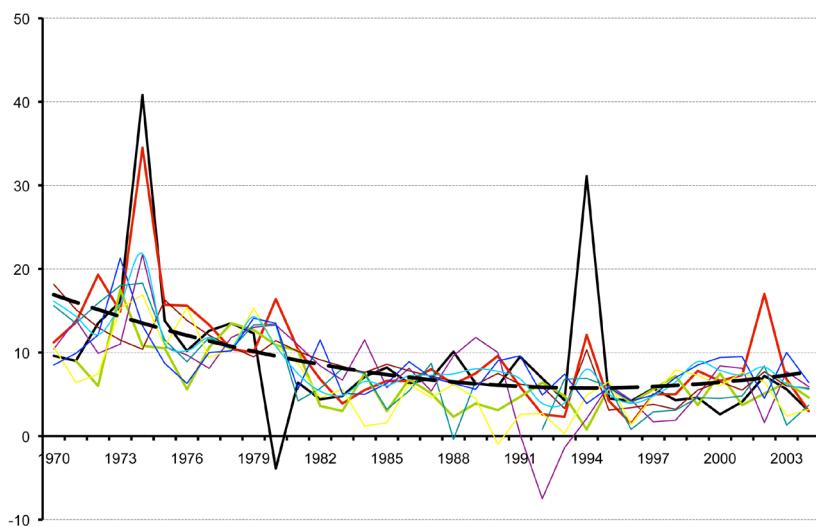
#### SWEDEN – ANNUAL AVERAGE GROWTH IN GDP AND HEALTH EXPENDITURES



#### UNITED KINGDOM – ANNUAL AVERAGE GROWTH IN GDP AND HEALTH EXPENDITURES

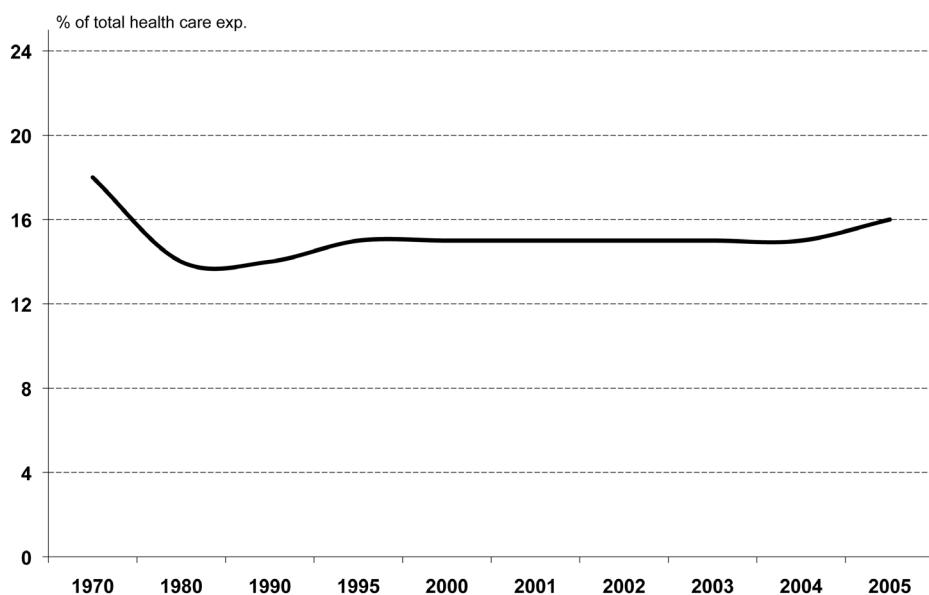


#### ANNUAL AVERAGE GROWTH OF PER CAPITA HEALTH-CARE EXPENDITURES



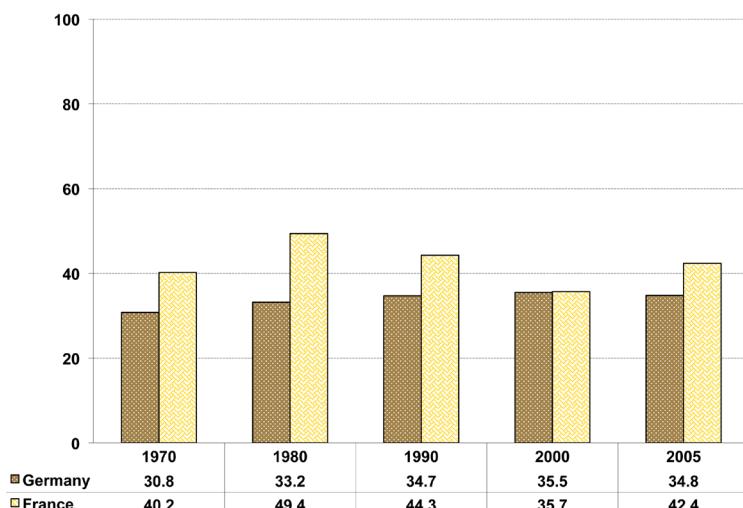
## Annex 2

TOTAL PHARMACEUTICAL EXPENDITURE OF TOTAL EXPENDITURE ON HEALTH CARE (1970-2005)

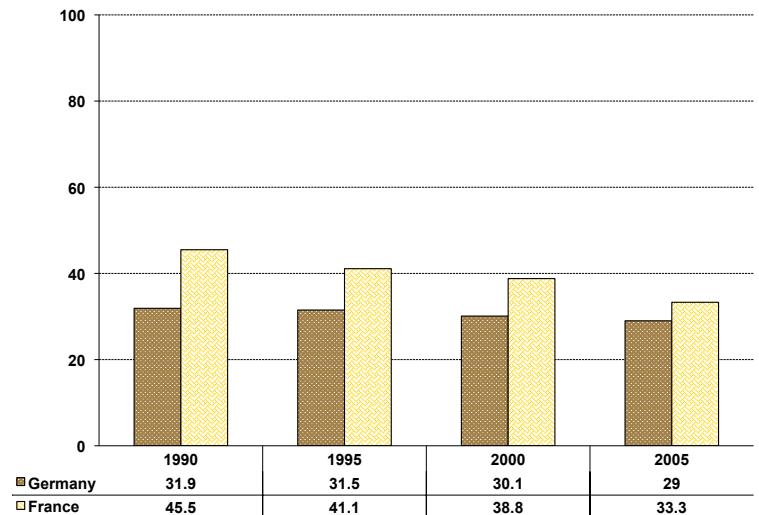


## Annex 3:

HEALTH CARE EXPENDITURE FOR INPATIENTS SERVICES AS SHARE OF TOTAL EXPENDITURE

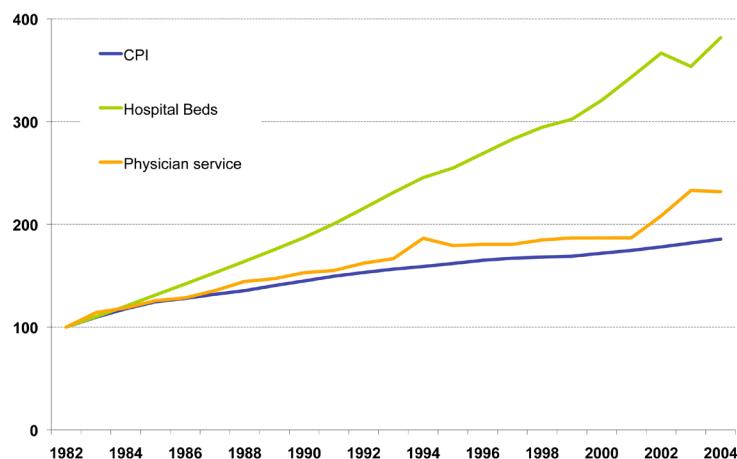
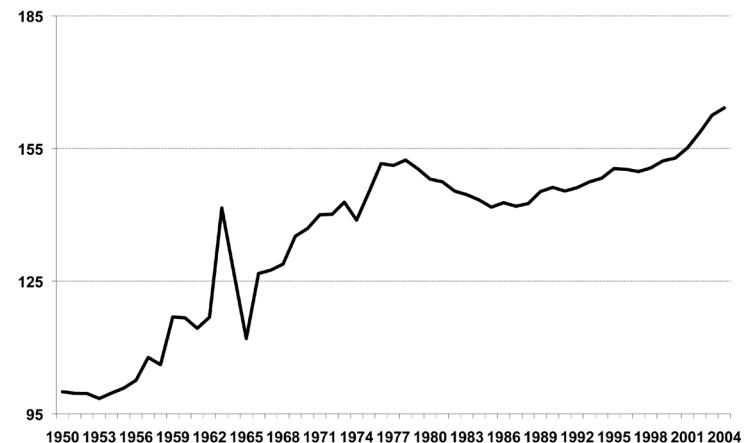


HEALTH CARE EXPENDITURE ON HOSPITAL SERVICES AS SHARE OF TOTAL EXPENDITURE

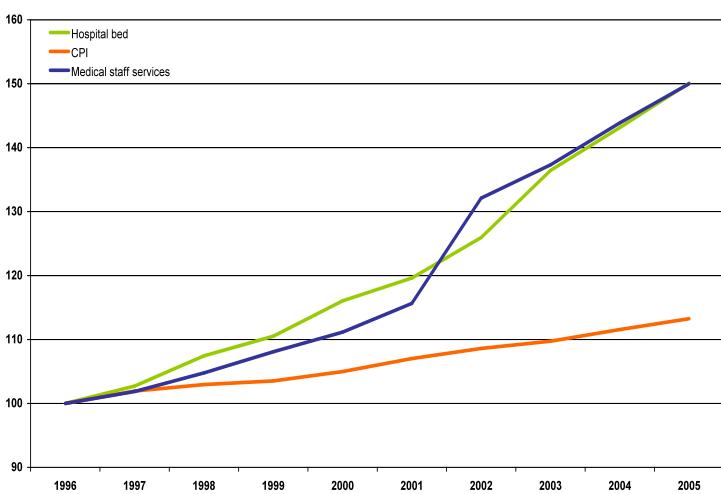
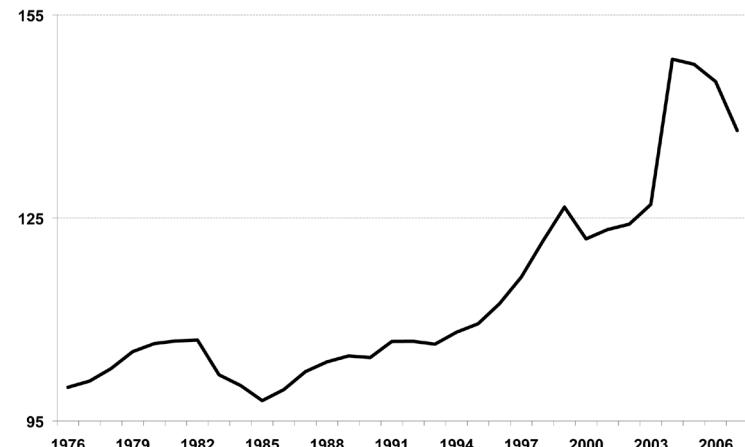


## Annex 4:

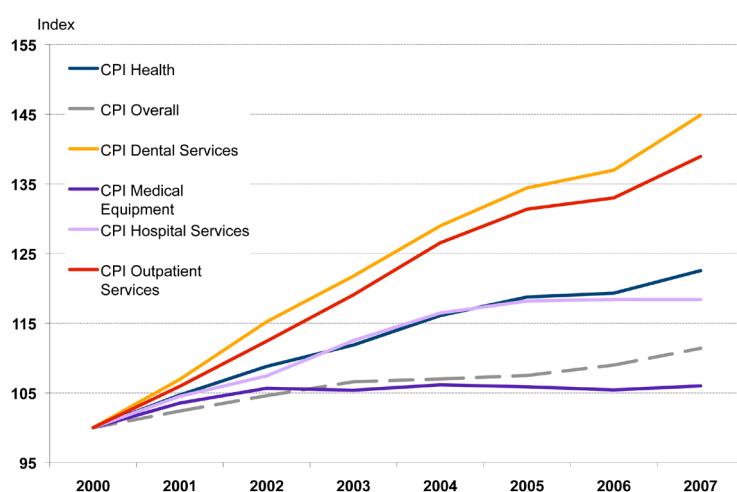
CPI, PHYSICIAN'S SERVICES AND HOSPITAL BEDS (1982-2004) FRANCE

REAL PRICE INDEX FOR HOSPITAL SERVICES  
(HOSPITAL PRICE INDEX CORRECTED FOR INFLATION) (1950-2004) FRANCE

Price Indices for Health Care (1996-2005) GERMANY

REAL PRICE INDEX FOR HOSPITAL SERVICES  
(HOSPITAL PRICE INDEX CORRECTED FOR INFLATION) (1950-2004) GERMANY

CPI FOR HEALTH AND ITS SUBSECTORS SWEDEN (1980-2007)



CPI FOR HEALTH AND ITS SUBSECTORS UNITED KINGDOM (2001-2007)

