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WORKING PAPER

Bureaucratisation and the growth of health care expenditures in Europe

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Bureaucratisation and the growth of health care expenditures in Europe

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Abstract

The public choice literature suggests that bureaucrats might join forces with specific pressure and industrial groups which advocate an expansion of health care activities. As a result, the ongoing process of bureaucratisation can be a driving force behind the overproduction of health care services. In addition, Michel Foucault was the first to depict medicalisation and normalisation as processes part of a broader institutional infrastructure set up to control individuals. Both processes require a strong bureaucracy, established by the ruling elites. For our empirical analysis, the share of government employment in total employment has been used as a proxy for bureaucracy. Our results show that the process of bureaucratisation has a very significant and positive influence on national health care expenditures per capita in 20 European countries. Together with the evolution of per capita income, we can conclude that the ongoing bureaucratisation is one of the driving forces behind the rise of health care expenditures in Europe. A similar conclusion holds for the research intensity of the country. However, the combination of a high level of bureaucratisation and a high research intensity results in lowering per capita health expenditures. Our results furthermore confirm that the ageing of the population is consistently not significant once bureaucratisation is included in the analysis.

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1. Introduction

Controlling the growth of health care expenditures is a political priority in most developed countries. Especially in the countries with the highest health care expenditures as a share of GDP[1], proposals for fundamental reforms of the health care system have been high on the budgetary agenda in the last two decades (Hacker, 2004). Cost containment attempts are needed because of the growing capacity of medicine and the enormous expansion of offered health care services (Braithwaite, 1997). Although a few countries managed to reduce the relative share of health care expenditures as a share of GDP between 1980 and 2000 – in Sweden and Denmark the relative share of health care expenditures has been reduced by respectively 4.5% and 8.8% (Hacker, 2004) –, recent figures clearly suggest upward trends. In OECD-countries, the annual growth rate of health care expenditures between 1997 and 2002 was 4.3%, a dramatic increase compared to the 2.5% growth rate between 1992 and 1997 (OECD, 2004). There is not a single explanation for the growing importance of health care services in our modern society. Cross-country differences in health care expenditures have been studied by many authors, with an emphasis on structural and technical determinants. Essential structural determinants are the income level and institutional characteristics of health care systems, while the ageing of the society, higher life expectancies and the increasing costs of new pharmaceuticals and medical technologies are frequently used technical determinants. In micro-economic models at the national level, wage evolutions for different categories of medical personnel are also included.

Although economic factors are of essential importance and dominate the debate on health policy reforms, the rise of the 'health project' incorporates much more than new equilibriums between supply and demand conditions. Beck and Beck-Gernsheim (2002) refer to the modern concept of health as a guiding value of the individualized society. They distinguish two driving forces behind the rise of the 'health project'. In the course of secularisation, health became a secular expectation of salvation. What can no longer be expected from an afterlife – freedom from cares, illness and suffering – is projected to life on earth. Furthermore, they stress the essential human condition to perform and produce in our individualised market

[1] In 2004, health care expenditures in the US amounted to 14.6% of GDP. Switzerland and Germany did spend respectively 11.2% and 10.9% of their GDP on health care (OECD, 2004).

society. From this perspective, the development of a public health care system ensures the appropriate quality or health status of the human resources in the economic system and is presented as a compensation for the suffering of the labouring population.

Illich (1976) argues that people in highly industrialized societies are conditioned just to receive goods and services instead of providing themselves even basic services. Self-care then becomes a disappearing attribute. This attitude created dependant consumers for whom an expansion of health care services can only be seen as highly desirable. Similar arguments have been developed by Kleinman (1980) with his typology of three health care sectors: the popular, the professional and the folk sector. Kleinman (1980) suggests that between 70 and 90% of illnesses are managed within the popular sector. Lay people only activate their professional and non-specialist health care by deciding to consult an outsider. In our consumer-culture, popular self-care practises are gradually replaced by a growing monopoly of professional health care providers. Apparently, our modern culture attaches high value on external opinions and control mechanisms.

But there are other, more endogenous factors involved in medicalisation of society. The latter concept can be defined as the ongoing tendency of public problems to be defined as medical problems (e.g. the medical perspective on the quality of the labour population). Scientific progress can impact existing boundaries and societal needs. Melzer and Zimmern (2002) argue that over time, the diagnostic and treatment boundaries have expanded to include people with milder manifestations of pathology and lower levels of risk in the 'disease' category. A new process of premature medicalisation seems to emerge with genetic tests for markers that may not result in symptoms for half a century or more (Melzer and Zimmern, 2002).

Since cultural attitudes and values towards the 'health project' clearly interact with supply and demand conditions, this paper aims to introduce into the analysis of health care expenditures several aspects of public choice theorizing concerning bureaucratisation and its consequences. In addition, we want to highlight the link between medicalisation and societal control mechanisms.

2. Bureaucratisation and the supply-centred coalition

The health care bureaucracy is growing with rising health care expenditures, but can the ongoing process of bureaucratisation trigger increasing health care expenditures?

The Niskanen (1971) model concludes that the discretionary and monopoly powers of bureaucrats lead to suboptimal health care overproduction in order to maximise the utility of bureaucrats. An overexpansion of the size of the public sector can also be explained by industrial and professional pressure group activities, especially when vote maximising politicians can 'buy off' demands by different societal groups (Buchanan and Tullock, 1962). Both perspectives suggest that the emergence of a coalition of bureaucrats and pressure groups is hardly avoidable. However, the utility of bureaucrats will not continue to increase linearly with larger budgets because of coordination costs and growing uncertainty with respect to future power balances among (new) departments. Furthermore, control rather than expansion can be the dominating goal of bureaucrats. From the resource dependence perspective (Pfeffer and Salancik, 1978), bureaucracies need resources to continue functioning. Health care cost containment efforts create uncertainties and therefore bureaucrats might join forces with specific pressure and industrial groups which advocate an expansion in the bureaucrat's activities. Given the specialised information available to bureaucrats, they make valuable allies for pressure groups (Jackson, 1982). The increase of screening campaigns is illustrative for this evolution. Health care bureaucrats and the suppliers of health care services stress increased levels of efficiency as a response to cost containment proposals by politicians. Increasing inpatient throughput becomes a target for hospitals that want to increase their level of efficiency. Hence, more patients need to be found and mass screening of the population can result in higher inflows. This interpretation of improved cost-effectiveness ratios – lower costs per patients to realize a specific level of effectiveness– is strongly criticized by authors stressing that not cost-effectiveness ratios but outcomes of medical interventions and the distribution of services based on needs are essential characteristics of a high quality public health care system (Braithwaite, 1997). However, the efficiency answer to cost containment efforts is supported by the medical profession because it does not preclude an absolute health care budget growth.

The medical profession constitutes a special interest group. Peterson (2001) explains how the medical profession could obtain a monopoly over its work and became over time so strong that it could preserve two core domains of autonomy: economic (the size and circumstances of physicians' incomes) and clinical (control over the nature of medical practice and treatment decisions). It is very likely that bureaucrats and the medical profession will form a coalition to reconcile increasing

cost concerns with their own interests. Furthermore, since medical professionals define illness, they can influence the demand for specific medical treatments and hence safeguard their own interests but also those of the related bureaucrats. In their analysis of the health care and welfare market, Illich (1976) and Achterhuis (1981) were among the first to confirm the validity of Say's Law with numerous examples of how the supply of health care services creates its own demand. With the arrival of genetic information, the future market opportunities for new categories of interventions and pharmaceuticals appear unbounded. The exploration of these opportunities requires enormous investments and hence the awareness of the social importance of the new research directions. Private industry therefore needs support from policymakers in terms of R&D-funding and market creation. By entering the enormous health care market, private industry enforces the existing supply-centred coalition of the medical profession and health care bureaucrats. This is an economic process that made it possible to create immeasurable health benefits for humanity in the recent decades. Some very critical authors however question recent new trends in the coalition of big pharma and big government. Moynikan, Heath and Henry (2002) even argue that some forms of 'medicalisation of the society' may now be better described as 'disease mongering' to expand markets for new products. They state rather straightforward that '*there's a lot of money to be made from telling healthy people they're sick* (Moynikan, Heath and Henry, 2002).' Their overview of inappropriate medicalisation, the marketing of fear and related communication strategies to shape medical opinion[2] – to establish a need for a new drug and create the desire among prescribers –, concludes that the medicalisation of human distress seems to have no limits. Although this rather extreme view can partly reflect reality, we should also be aware of the changing attitude of patients; several groups of patients (or their families) put enormous pressures on doctors to proceed with whatever possible treatment.

This broad coalition of bureaucrats, industrial pressure groups and medical professionals is not counterbalanced by vote maximising politicians when public opinion endorses the '*more is better'* credo with respect to the provision of health

[2] 'One in twenty Belgians suffers from obsessive-compulsive disorders (De Zondag, 2005)' was a leading article in De Zondag, a free newspaper distributed in Flemish bakeries on Sundays. The author mentions that only 16% of the patients receives some type of treatment. An obligatory section in articles like this learns the reader to recognise the problem or disease.

care. Bureaucrats know however that there are limits to health care expenditures as they are aware of the budgetary confinements within which they operate. Hence, they have to choose among the available medical technologies. This is especially the case as new medical technologies often do not replace 'old' technologies but allow more illnesses and people to be treated. These new technologies are therefore unlikely to be cost-saving (McGuire and Serra, 2005). From the point of view of the bureaucracy, this implies that they have to make a choice among the technologies that become available. One can assume that a powerful bureaucracy will be able to make better informed, rational choices and choose, among all available technologies, the ones that are the most efficient. The latter assumption will be tested by the empirical model in section 4.

3. Control and responsibility

The formation of a coalition of winners from an expanded health care system is still an incomplete explanation for the rise of the 'health project'. A crucial question relates to why and how people become patients. This transformation from healthy individual to patient is related to the medicalisation of society or the tendency of public problems to be defined as medical. By defining people who behave strange as 'sick', their status in society is changed and they become patients in the hands of professionals who will decide on appropriate treatments. Michel Foucault was the first to depict medicalisation as a process part of a broader institutional infrastructure set up to control individuals and to prescribe normalised behavior (Zwart, 1995). In *Surveiller et punir*, Foucault (1975) observes a panoptical[3] power in modern societies – biopower or *la biopolitique* –, that seek to control every single aspect of human life including the human body and soul. The resulting control mechanisms invaded our society and deny the identity-constructing ability of individuals. Humans experience the need to assume passive attitudes and become consumers, not producers. For Foucault, the modern welfare state pursues the utopian goal of organising people's life based on technocratic rationalities and the consent of normalized populations. In his writing, he stresses the close interconnectedness of control institutions, scientific

[3] In 1791, Jeremy Bentham introduced the panopticum in his writings. The panopticum is an architectural principle to control large groups of people by a minimal number of guards (Foucault, 1975).

developments and new technologies (Foucault, 1975). Our high-tech society enables unseen control and regulatory interventions that start before birth and now even already include the option of euthanasia in a few countries.

The ultimate phase of exertion of panoptical power is a situation of self-mastery in which humans start to control themselves. As such, they have internalized formerly external control systems. People suffer from the imposed control mechanisms but the rationalities of control and societal efficiency render opposition into unreasonable and unacceptable behaviour. With his theories on the normalisation of the population, Foucault suggests that power structures serve a twofold goal: they aim at maximizing the size and the adaptability of a healthy and hence productive labour force, and secondly prevent uncontrollable opposition against ruling elites (Achterhuis, 1981). This process of normalisation requires a strong bureaucracy, set up by the power elites. Apparently, the first goal has been realised. Beck and Beck-Gernsheim (2002) explain the rise of preventive care as an element of self-management imposed on modern individuals. Our society increasingly expects from people to act responsible with respect to one's own health. Beck and Beck-Gernsheim (2002) attach the terms 'voluntary compulsion' or 'preventive compulsion' to the requirements of societies in which claims on community resources in case of illness will be matched by the obligation to be healthy. As predicted by Heidegger in 1938, new technologies lead to compulsory self-management of the individual health and hence turns the individual into an economic resource, this time not mobilized for war purposes but for industrial-economic purposes (Heidegger, 1977). In the next section we elaborate an empirical model to assess the impact of processes of bureaucratisation and control on the evolution of public health care expenditures.

4. Empirical analysis

4.1 Data and hypotheses

Our empirical model tries to assess the impact of the bureaucratisation as an explanation for the differences in per capita health care expenditures between 20 European countries for the period 1980 to 2000. As dependent variable, we used the log of the average public health care expenditures per capita (which we will denote with 'Hecap'), at 1995 prices and adjusted for purchasing power parities (PPP). The data were averaged over periods of five years, i.e. 1980-1984, 1985-1989, 1990-1994

and 1995-1999. We used 5-year averages as our focus is on structural relationships between variables. It allows us to isolate the analysis from short-run influences. Furthermore, annual changes in some of our independent variables are extremely limited. Based on data availability, 20 European countries were included in our analysis: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland and United Kingdom.

In the preceding paragraphs, we introduced bureaucratisation and external as well as internal control factors in our modern society. Although bureaucratisation and control factors play a different theoretical role in explaining the evolution of the health project, they are closely intertwined as discussed in section 3. Bureaucratisation ('Bur') can be measured by the relative size of government or the scope of public policies. An alternative would be to assess the regulatory burden in different countries. However, limited data availability on the number of laws and regulation and their impact necessitated us to focus on the human resources of the bureaucracy. We measure bureaucratisation as the share of government employment in total employment. Since bureaucracies have been created to control modern societies and to guarantee stability (Jackson, 1982), we can measure bureaucratisation as well as control mechanisms in society by the relative share of government employment in total employment. A growing bureaucracy implies strategic behaviour to ensure the needed financial resources. Therefore, an ongoing expansion of activities in a coalition with various pressure groups is the best insurance against future reductions in the size of the bureaucracy. Our assumption with respect to the interaction with pressure groups is rather simplistic; more bureaucrats will make more coalitions likely for the simple reason that in highly regulated societies, bureaucrats have the monopoly to create new markets. At the same time, every bureaucrat is controlling a specific activity or condition of modern society. Hence, more bureaucrats enable a wider scope of controlling activities. There are of course many other sources of control in modern societies but these are not the essence of public policy. Furthermore, existing control mechanisms such as in marriages, religious, cultural and educational institutions do not disappear once governments regulate other aspects of daily life. As both functions of bureaucrats are impossible to distinguish, we opted to work with the share of government employment in total employment as the variable that captures the propensity of bureaucracies to support supply-centred

health coalitions as well as the imposition of control mechanisms on society. Vaccination campaigns are illustrative for the capacity of health bureaucrats to create new markets and control the health status of the population. For our empirical analysis, government employment was calculated based on ILO's (International Labour Office) employment statistics. We worked with 5-year averages and total government employment is the sum of the ISIC-3 categories L (Public administration and defence; compulsory social security), M (Education), N (Health and social work) and O (Other community, social and personal service activities)[4]. Hence, government employment data include all jobs that are publicly financed. As the N category includes health-related jobs as well as jobs in the social sector, a growth of health-related public jobs will directly impact expenditures. Since we measure bureaucratisation as the share of government employment in total employment, an increase in health-related jobs only leads to an increased bureaucratisation when private job creation is lower than total public job creation. The relationship between health-care jobs in the independent variable bureaucratisation and health care expenditures as dependent variable is therefore not an linear one. The share of category N in total government employment varies strongly among countries. For 2000, this share was 7.9% for Austria, 11.6% for Belgium, 6.1% for the Czech Republic, 17.4% for Denmark[5], 14.3% for Finland etc. However, these percentages also include the important category of 'social work'[6]. Annual government employment or bureaucratisation data are presented in *figure I* for a selection of countries.

Figure I shows that there are enormous differences for the subset of selected countries. For most countries, we observe an increase of the bureaucratisation – measured as government employment in total employment – between 1980 and 2000. However, once a high level of bureaucratisation is reached – close to 35% – further

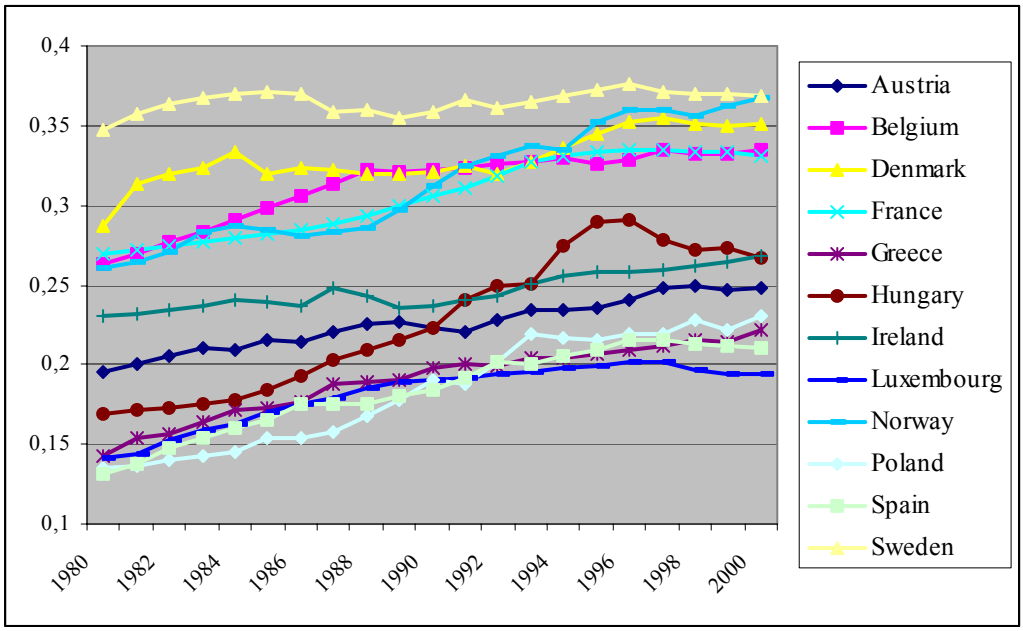
[4] On-line source: http://laborsta.ilo.org/

[5] Statistics Denmark provides series of employment in 'human health activities'. Between 1994 and 2000, employment in this category remained more or less stable (from 8 417 to 8432 jobs) while the share of government employment in total employment increased from 33.58% to 35.05%

[6] With the introduction of ISIC-3 specific data for category N are available for all countries. Before the introduction of ISIC-3, only aggregated government employment data can be used (L+M+N+O). Unfortunately, only a few countries implemented ISIC-3 before 1990 (Ireland in 1986, Sweden in 1987, the UK in 1988, Finland in 1989). Most other countries followed in the mid-1990s or later (Austria in 1994, Belgium in 2001, Germany in 1995, the Netherlands in 1995, Norway in 1996 etc). As a result, excluding category N from total employment data would create for each country at a different moment in time a significant downward shift in the series (in Ireland in 1986 but in Norway in 1996). To avoid this disturbance, we opted to include category N in our analysis.

growth becomes difficult. We observe a stabilization of the bureaucratisation in Sweden, Denmark, Belgium and Norway for the period 1995-2000. A similar stabilization but at a much lower level is found in Luxembourg, Spain, Austria and Ireland.

Figure I: Evolution of bureaucratisation in selected European countries



Source: based on ILO employment statistics (http://laborsta.ilo.org)

In our empirical work, two specific hypotheses with respect to bureaucratisation are tested. First of all, we want to know whether a higher degree of bureaucratisation resulted in higher per capita health expenditures. Furthermore, since administrators decide on the use of new technologies in health care, we can expect that their expertise should make it possible to select the most efficient and effective technologies and treatments. A strong bureaucracy should have the competences to select the most relevant health and other R&D priorities, to assess outcomes of R&D and to allocate the new technologies in order to create social benefits. Reliable data on the production or use of new medical products and technologies are not available for our sample of countries so we needed to use the number of researchers per thousand employees ('Res' in *table I*) as a proxy variable. We assume that in countries that strongly invest in technological innovation, a fast diffusion of new technologies is relatively easy. As research output in health care is 'slow' to reach the market, we

lagged this variable with five years. To test for the latter hypothesis on the selection of technologies, the interaction between bureaucratisation and the production of new technologies is explicitly integrated into the model (Bur x Res in *table II*).

The literature on health care expenditures suggests several other explanatory variables. First of all, a measure of health outcomes should be included. Health output can be measured by life expectancy ('Lifeexp' in *table I*) (Coory, 2004; Schieber, 1993). For this variable, 5-year averages were taken. In the popular debate, policymakers often claim that growing public health care expenditures are the result of the ageing of the population. This variable ('Pop65' in *table I*) was measured as the share of the population older than 65 year in total population (Barros, 1998; Roberts, 1999; Seshamani, 2004). This variable was also averaged over the same 5-year periods. Furthermore, PPP-adjusted income per capita ('GDPcap' in *table I*) was also included as an explanatory variable (Gerdtham, 2000, 2001; OECD, 2002; Roberts, 1999) and the log of the 5-year averages was taken. We used World Development Indicators by the World Bank (2002) for the data on public health care expenditures, population, life expectancy, numbers of researchers and per capita income. As noted by McGuire and Serra (2005) health care expenditures are likely driven by the availability and use of new technologies. Our proxy 'Res' will be used to control for the impact of new technologies on health care expenditures. *Table I* provides the mean and standard deviation of these variables.

Table I: mean and standard deviation of our variables

	LogHecap	Bur	Res(-5)	Lifeexp	Pop65	LogGDPcap
85-89	6.754[a] (0.474)[b]	0.244 (0.057)	3.171 (1.222)	74.759 (2.030)	13.597 (1.822)	9.481 (0.346)
90-94	6.932 (0.465)	0.263 (0.053)	3.774 (1.382)	75.547 (2.297)	14.323 (1.645)	9.688 (0.367)
95-99	7.041 (0.436)	0.279 (0.056)	4.580 (1.645)	76.559 (2.177)	14.875 (1.608)	9.880 (0.361)

a: mean
b: standard deviation

Finally, dummies were used to reflect institutional characteristics of national health care systems. The OECD characterizes national health systems in three categories: public reimbursement, public contract and public integrated. Under the public reimbursement system, providers receive retrospective payments for services supplied. A reimbursement system is often coupled to a fee-for-service payment arrangement and can be found in systems with multiple private and public insurers

and multiple suppliers. The public contract system aims at a higher degree of control over total funding and its distribution. This is obtained by agreements between third-party payers and health care providers. In integrated systems, one single agency controls both the funding and the provision of (public) health services (Gerdtham, 2001). Two dummies reflect the type of health system: public reimbursement (DumPR: Belgium, France, Luxembourg and Switzerland) and integrated system (DumINT: Denmark, Finland, Greece (from 1983), Hungary (up to 1994), Ireland, Italy, Norway, Poland, Portugal, Spain (from1984), Sweden and United Kingdom. The remaining countries (Austria, Czech Republic, Germany, Greece (up to 1982), Hungary (from 1995), the Netherlands and Spain (up to1983)) were classified as the baseline system, i.e. public contract (Barros, 1998; Gerdtham, 2001).[7]

A second institutional characteristic is whether or not the physicians/general practitioners act as gatekeepers in the health care system. With gatekeepers, the patient has to see the gatekeeping physician/general practitioner before gaining access to more specialised medical care. The following countries were classified as gatekeeping (DumGK): Austria, Denmark, Germany, Hungary (From 1993), Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Spain, and United Kingdom. In the remaining countries no gatekeeping is considered (Belgium, Czech Republic, Finland, France, Greece, Hungary (up to 1992), Luxembourg, Sweden and Switzerland) (Barros, 1998; footnote 5). If one of the institutional health system characteristics changed during the five year periods, the value of the dummy in the first year of that period was taken into account.

Finally, three from our 20 OECD countries could be entitled as economies in transition, i.e. Czech Republic, Hungary and Poland. These countries have made reforms to make a transition from a planned to a market economy. A dummy (DumEIT) was included for this specific characteristic.

4.2 Equations

Three equations were set up for respectively the time periods 1985-1989, 1990-1994 and 1995-1999.

[7] The country classifications for the Czech Republic, Hungary and Poland were based on the following sources: Czech Republic: World Health Organization, 1996; Hungary: Gaal, 2004; Poland: European Observatory on Health Care Systems, 1999.

$$\text{Hecap}_{\text{i, 85-89}} = \beta_0 + \beta_1 \times \text{Bur}_{\text{i, 85-89}} + \beta_2 \times \left(\text{Bur}_{\text{i, 85-89}} \times \text{Res}_{\text{i, 80-84}}\right) + \beta_3 \times \text{Res}_{\text{i, 80-84}} + \beta_x \times \mathbf{X}_{\text{i, 85-89}} + \varepsilon_{\text{i, 85-89}}$$

$$\text{Hecap}_{\text{i, 90-94}} = \beta_0 + \beta_1 \times \text{Bur}_{\text{i, 90-94}} + \beta_2 \times \left(\text{Bur}_{\text{i, 90-94}} \times \text{Res}_{\text{i, 85-89}}\right) + \beta_3 \times \text{Res}_{\text{i, 85-89}} + \beta_x \times \mathbf{X}_{\text{i, 90-94}} + \varepsilon_{\text{i, 90-94}}$$

$$\text{Hecap}_{\text{i, 95-99}} = \beta_0 + \beta_1 \times \text{Bur}_{\text{i, 95-99}} + \beta_2 \times \left(\text{Bur}_{\text{i, 95-99}} \times \text{Res}_{\text{i, 90-94}}\right) + \beta_3 \times \text{Res}_{\text{i, 90-94}} + \beta_x \times \mathbf{X}_{\text{i, 95-99}} + \varepsilon_{\text{i, 95-99}}$$

In these equations a subscript *i* indexes the countries in our sample, **X** contains the other explanatory variables (such as Lifeexp, Pop65 and GDPcap) as well as DumPR, DumINT, DumGK and DumEIT. e_i is the error term. As mentioned before, data were available for all countries during the period 1980-2000. Due to the lagged influence of our research variable, only three equations could be set up. The complete set of parameters of the equations were estimated simultaneously in a system. The parameters were estimated as a linear panel data model (Wooldridge, 2002). We have not used fixed effect panel as our dummy variables can not be estimated with country-specific fixed effects. A cross equation coefficient restriction was imposed by using the same coefficients in the three equations. Unfortunately, the limited amount of observations does not allow us to estimate various equations per period as we do not have sufficient degrees of freedom.

5. Results

Our results are presented in *table II*. In general, the fit of our equations is very good. Especially for the second equation (1990-1994), the explanatory power (adjusted R^2) of the models is excellent and the Jarque Bera-statistic suggests that residuals are normally distributed for each of the 3 equations. Before addressing the impact of bureaucratisation, it is useful to consider first the results in the columns (1) and (2) of *table II*, which mimic models previously estimated in the health care literature. The results clearly indicate that our data do not yield results that differ substantially from the ones obtained in literature. Both estimates show, as expected, that the average income level and research intensity have a positive and significant impact on per capita health care expenditures. Furthermore, the estimates on the average income level suggest that the income elasticity of public health care expenditures equals 1 (Barros, 1998). GDP per capita seems to be the most important single explanatory factor (Barros, 1998; OECD, 2002; Reinhardt, 2002). A higher life expectancy resulted in lower per capita health expenditures (significant at respectively 5 and 1%). In other words, a healthier population is an indication for lower per capita health care

expenditures. The share of the population over 65 has a positive impact on per capita health care expenditures only when the institutional dummies are included (model (2)). The inclusion of the institutional dummies also leads to a constant term with a positive sign.

Table II: Estimation results

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Constant	-1.721** (-2.598)	1.820* (1.704)	-2.838*** (-4.096)	0.605 (0.550)	-1.284 (-1.151)	-2.342*** (-3.164)
Bur			3.832*** (3.376)	3.540*** (3.517)	3.775*** (3.368)	3.611*** (3.396)
Bur x Res			-0.709*** (-2.679)	-0.602** (-2.606)	-0.708*** (-2.740)	-0.596** (-2.358)
Res	0.056*** (3.628)	0.068*** (4.523)	0.221*** (3.029)	0.201*** (3.023)	0.231*** (3.200)	0.179** (2.520)
Lifeexp	-0.030** (-2.518)	-0.050*** (-3.716)	-0.013 (-0.972)	-0.033** (-2.312)	-0.025* (-1.691)	-0.012 (-0.897)
Pop65	0.019 (1.478)	0.032** (2.537)	0.013 (0.945)	0.022 (1.651)	0.012 (0.881)	0.020 (1.451)
GDPcap	1.077*** (12.542)	0.858*** (9.553)	0.972*** (10.074)	0.783*** (7.865)	0.913*** (9.078)	0.922*** (9.381)
DumPR		-0.053 (-0.700)		-0.058 (-0.817)		-0.017 (-0.255)
DumINT		-0.163*** (-3.277)		-0.147*** (-3.205)		-0.093** (-2.197)
DumGK		-0.042 (-0.882)		-0.078* (-1.781)		-0.066 (-1.569)
DumEIT		-0.286*** (-3.006)		-0.272*** (-2.994)	-0.156 (-1.647)	
Adj. R^2 1985-1989	0.805	0.779	0.844	0.827	0.836	0.839
Adj. R^2 1990-1994	0.939	0.907	0.955	0.936	0.941	0.950
Adj. R^2 1995-1999	0.853	0.884	0.824	0.852	0.812	0.828

a: coefficient
b: t-statistic
*** Significant on 1% level
** Significant on 5% level
* Significant on 10% level

Starting with column (3), the results of the more complete models with bureaucratisation and the institutional dummies are presented. To check the robustness of our results for various institutional settings, we estimated various equations with and without the institutional dummies and the dummy for economies in transition.

We find that the process of bureaucratisation has a very significant (1%) and positive influence on national health care expenditures per capita. Together with the evolution of per capita income, the ongoing bureaucratisation is one of the driving forces behind the rise of health care expenditures in Europe. A similar conclusion holds for the research intensity of the country. However, the combination of a high level of bureaucratisation and a high research intensity lowers per capita health expenditures. Precisely a strong bureaucracy implies the ability to make rational use of technological innovations. We find a negative coefficient for this interaction term (significant at 1%-level, except at 5% in column (6)). The inclusion of the interaction term – with a negative coefficient- increases the coefficient of the research variable in columns (3)-(6) when compared to the first two columns. The results in column (3)-(6) for the bureaucratization index, research intensity and the interaction term are very robust for the institutional setting. This suggests that the impact of these variables on public health care expenditures is comparable across various institutional health care systems. Also for models (3), (5) and (6), the Wald coefficient test does not allow us to reject the hypothesis that the income elasticity of public health care expenditures differs from 1 at a 1% significance level.

Without the institutional dummies, the impact of both life expectancy and the share of the population older than 65 is not significant (column (3) and (5)). Life expectancy is only significant at the 5%-level in the model of column (4) when all the dummies are included. However, the ageing of the population is consistently not significant once bureaucratisation is included in the analysis. In contrast to popular opinion, ageing is not at all a driving force behind the rise of public health care expenditures per capita. This finding is in line with previous results (Barros, 1998; OECD, 2002). Apparently, per capita health care expenditures seem to depend on the remaining lifetime of the individual, i.e. the terminal phase of life is very expensive, independently of whether this phase starts at age 60 or 90. An increase in the older than 65 share in the population seems to shift the bulk of expenditures to higher age categories, leaving expenditures per capita more or less unchanged (Zweifel, 1999). As mentioned by Coory (2004), projections from models even show that an increase in expenditure due to population ageing would be small and manageable (see also McGuire and Serra, 2005).

We find that of the three health care system dummies, only the dummy for integrated systems has a highly significant and negative impact on per capita health

care expenditures in Europe (at the 1%-level in (2) and (4)). The two other health care system dummies also have a negative coefficient but are not significant. Compared to the system of public contract, an integrated system is almost 15% cheaper if we consider the results in column (4) of *table II*. It should be noted that the findings of previous studies on the influence of type of health system are not consistent. Barros (1998) and Gerdtham (1998) found that countries with a public reimbursement system were able to have a lower fraction of GDP devoted to health care expenditures. For the first study, this was only significant if level equations were used instead of growth rate equations. In contrast, an OECD study found that a public reimbursement system was more expensive when comparing with public contract or integrated systems (OECD, 1992). These differences may be due to the selection of countries and time periods. Our results with respect to gatekeeper systems are similar to the results of Barros (1998), i.e. they have no explanatory power of health care expenditures.

The dummy for the economies in transition is highly significant when added to the health care system dummies ((2) and (4)). Model (5) shows that without the health system dummies, the economies in transition dummy is not significant. Not surprisingly, economies in transition have significantly lower health care expenditures.

To test the economic significance of our results, we estimate what would happen in the presence of a 1 standard deviation shock to an explanatory variable. Assume for instance that the level of bureaucratization increases with 1 standard deviation. Based on our 95-99 data, from *table I* it can be seen that this means that the level of bureaucratization increases with 0.056. Compared with the average level of bureaucracy, a rise with 0.056 represents a 20% increase. Using our estimates in column (4) of *table II*, this means that the log of the hecap increases with 0.198 (=3.540*0.056), which respresents a 21.9% increase in per capita health care expenditures. However, evaluated at the cross section average level of research intensity (4.58 per thousand inhabitants), this increase in bureaucracy means that it is better equipped to deal with technology. This reduces the impact of a 1 standard deviation increase in the level of bureaucracy with 14.3% (= exp(-0.602*0.056*4.58)-1) on per capita heath care expenditures. Hence, the net effect of a 1 standard deviation increase of bur on hecap equals 7.6%. Likewise, a 1 standard deviation increase in research intensity increase per capita health care expenditures with 39.2%. However, as the bureaucracy now has a wider set of available options to choose from

this has a negative impact on expenditures. Evaluated at the average level of bureaucratization (27,90%) a 1 standard deviation increase in research intensity, through its impact on the available technologies, reduces per capita health care expenditures with 24,1% (= exp(-0.602*1.645*0.2790)-1). Hence, the net effect of a 1 standard deviation increase of research intensity on per capita health care expenditures equals 15%. *Table III* presents the results of this exercise for all variables in column (4) of *table II*.

Table III: impact of changing variables with one standard deviation

	St.dev.	Coefficient	Impact on loghecap	% impact on hecap
Bureaucratization	0.056	3.540	0.198	21.896
Interaction Bureaucratization and Research intensity	0.945	-0.602	-0.570	-43.447
Research intensity	1.645	0.201	0.331	39.236
Life expectancy	2.177	-0.033	-0.071	-6.854
Population 65+	1.608	0.022	0.035	3.562
GDP/capita	0.361	0.783	0.283	32.711

6. Conclusions

The rise of the 'health project' should be explained by assessing multiple driving forces. Cultural attitudes and values towards the 'health project' clearly interact with supply and demand conditions and we therefore introduced several aspects of public choice theorizing into the analysis of health care expenditures. The focus of our analysis deals with the bureaucratisation of society and its consequences. Our approach is motivated by two intertwined processes. First of all, the classic Niskanen (1971) suggests a suboptimal health care overproduction in order to maximise the utility of bureaucrats. The overexpansion of the size of the public sector can however also be explained by industrial and professional pressure group activities, especially when vote maximising politicians can 'buy off' demands by different societal groups. Hence, the emergence of a coalition of bureaucrats and pressure groups is hardly avoidable. Health care cost containment efforts create uncertainties and therefore bureaucrats might join forces with specific pressure and industrial groups which

advocate an expansion in the bureau's activities. Given the specialised information available to bureaucrats, they make valuable allies for pressure groups (Jackson, 1982). As a result, the ongoing process of bureaucratisation can be a driving force behind the overproduction of health care services. Secondly, our society appear to develop and diffuse more encompassing control mechanisms. Michel Foucault was the first to depict medicalisation and normalisation as processes part of a broader institutional infrastructure set up to control individuals and to prescribe normalised behaviour. This process of normalisation requires a strong bureaucracy, established by the ruling elites. For our empirical analysis, the share of government employment in total employment has been used as a proxy for bureaucracy. Our results show that the process of bureaucratisation has a very significant (at the 1%-level) and positive influence on national health care expenditures per capita. Together with the evolution of per capita income, we can conclude that the ongoing bureaucratisation is one of the driving forces behind the rise of health care expenditures in Europe. A similar conclusion holds for the research intensity of the country. However, the combination of a high level of bureaucratisation and a high research intensity results in lowering per capita health expenditures. Precisely a strong bureaucracy implies the ability to make rational use of technological innovations. Our results furthermore confirm that the ageing of the population is consistently not significant once bureaucratisation is included in the analysis. In contrast to popular opinion, ageing is not at all a driving force behind the rise of public health care expenditures per capita.

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