Public health expenditures in OECD countries: Does policy matter?

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Abstract

This paper examines how policy affects public health expenditures. Analyzing an OECD panel in the period from 1970 to 2004, four political variables are tested: Election years, the ideological party composition of governments, the number of coalition partners and if the ruling government has a majority in parliament. An electoral cycle is detected to be spurious and driven by endogenous election years. Interestingly, the impact of the governments' ideological orientation depends on the time interval considered. Left governments increased spending from 1970 to 1990, but decreased it from 1991 to 2004. Expenditures were smaller, the higher the number of coalition partners. Moreover, our empirical results indicate differences in health policy between single OECD countries and thereby confirm case studies. Overall, policy did not affect public health expenditures in a steady way and thus our results also confirm the special characteristics of the commodity health.

Keywords: public health expenditures, partisan politics, electoral cycles, panel data
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1. Introduction

In modern economies, the health sector plays a central role in social policy. Politicians have to decide on the design of health insurance, hospitals and the regulation of the pharmaceutical market etc. So far, papers that examine the political economy of health seem to be very rare. A potential reason is that health is a basic right and therefore no polarized political issue. This is apparent for some countries, also like the USA. But in contrast, DeVoe (2003), Laugesen (2005) and Tuohy et al. (2004) demonstrate in interesting case studies that left- and right governments did indeed pursue different health policies in Australia and New Zealand. Further case studies impressively point out the developments in other OECD countries (see section 2.3). These facts highly motivate us to analyze whether different governments did particular health policies and whether effects differ from country to country as well as between time periods. The current paper will make the contribution to extend well known tests of electoral cycles, the partisan approach and type of governments to this particular area of social policy. These phenomena – the meaning of the health sector in the welfare state in conjunction with the specialties of health as a commodity as well as the monetary dimension – strongly encourage us to investigate the role policy might have.

Researchers did not frequently examine econometrically how politicians affect particular fields in social policy – like health – but analyzed the impacts of different political variables on social expenditures in OECD countries (e.g. Iversen (2001), Kittel and Obinger (2003), Potrafke (2007) and also Vaubel (2000) and (2005) and Dreher (2006)). The empirical evidence is mixed. Overall, left governments increased social spending till the end of the eighties, while this effect seems to be mitigated in time elapsed. One might further conclude that social expenditures are a too general object of investigation, so that single political effects might not be detected as they could cancel out each other. Thus, the examination of particular fields of social policy seems to be very interesting.

Schmidt (1999) already asked if parties mattered for the rise of health care expenditures in OECD countries in a descriptive analysis. He concluded that the impact of government ideology on health is weaker than in other fields of social policy because health is a particular important and special commodity (see e. g. Breyer et al. (2005)). The peculiarity of health makes a respective analysis very attractive but also sophisticated. The demographic change and rising inequality has fuelled the fact that health became a more polarizing political issue during the last years and it is expected to be in the future. The question of inter- as well as intragenerational redistribution has become very crucial in developed countries. Parties have to (re)determine their positions,

platforms and policies. Of course, this is highly related to the interaction of the query to be re-elected (median voter) on the one hand side and party ideology and budget restrictions on the other. Health challenges politicians in particular.

As many times, the meaning of the health sector could be imposingly expressed in monetary terms. In fact, there is a rise of health care expenditures (HCE) and its examination became popular in the current scientific debate. Researchers ask for the main factors that drive this rise. Actually, it remains somewhat as a mystery.[2] First, researchers found a positive correlation between HCE and GDP in OECD data. They further found that GDP explains a high percentage of the variation of HCE compared to other variables (e. g. Newhouse (1977), Parkin et al. (1987), Gerdtham and Jönsson (1991), Gerdtham et al. (1992), Hitiris and Posnett (1992), also Leu (1986), Culyer (1989)). Second, time series econometricians discovered this field of literature as very fruitful – testing for panel unit roots, cointegration and structural breaks etc. (e. g. Hansen and King (1996) and (1998), McCoskey and Selden (1998), Gerdtham and Jönsson (2000), Carrion-i-Silvestre (2005), Jewell et al. (2003), Narayan (2006), Herwartz and Theilen (2003)). Introducing the third stage of this literature, Gerdtham and Jönsson (2000) encourage testing for "new" variables as regressors explaining HCE. Most recently, Hartwig (2007a) demonstrates that Baumol's (1967) growth model of 'unbalanced growth' offers a ready explanation for the rise in HCE in OECD countries. In a related paper, Hartwig (2007b) shows that also the relative price of medical care matters. Zweifel et al. (2005) detect a Sisyphus syndrome that describes a dynamic feedback effect between health care expenditure and life expectancy. However, we have to stress that this literature refers to total HCE and not public as in the current paper, but it is still somehow related.

The remainder of the paper is organized as follows: Section 2 carefully presents the theoretical and institutional background. First, the theories of the political business cycles and the partisan approach provide hypotheses on the impacts politicians might have on political outcome. Then we ask for the politicians' real room of manoeuvre in health policy and lastly introduce case studies on health politics in the OECD countries considered. Section 3 presents the data, their measurements and time series properties. In section 4 the empirical model is set up, the political variables are described and suitable estimation methods are briefly discussed. Section 5 reports the estimation results pointing out several characteristics while section 6 concludes the analysis.

[2] Gerdtham and Jönsson (2000) provide a comprehensive literature overview. See also Okunade et al. (2004) for more recent literature.

2. Theoretical and Institutional Background

2.1. Political business cycles, partisan approach and government types

The issue of this paper is to test for the effects of election years, the ideological party composition as well as the type of government on public HCE. The impacts of these variables on economic policy stem from a huge and model based literature of political economics. In this paper, our emphasis is not to find evidence for a single theoretical model. Instead we will very briefly repeat the main ideas of respective (well known) theoretical work establishing a basis for the following empirical analysis.

First, the political business cycle approaches and the partisan theory clarify how politicians try to influence economic outcome. One implication of the theories by Nordhaus (1975) and Rogoff and Sibert (1988) among others is that all politicians will implement the same policy. Ideology does not matter. Policies will converge. In addition, they imply a particular pattern between elections on the one hand and the impacts of economic policy on the other hand. Nordhaus (1975)' opportunistic school asserts that politicians fool the public just to win elections. They will boost the economic activity right before elections. The rational political business cycle theory by Rogoff and Sibert (1988) among others criticizes this modelling using adaptive expectations and introduces rational expectations instead. In this approach, information asymmetries play a role as a source of the electoral cycles. The political incumbent tries to exploit his information advantage by signalling his economic competence before elections. This scientific debate is still alive. Recently, Shi and Svensson (2006) show that politicians may behave opportunistically even if the voters know all the government programs, but some individuals are uninformed. Alt and Lassen (2006) point out that the higher the transparency of the political process, the lower the probability to behave opportunistically. Finally, we conclude from these approaches that election years will affect public HCE so that the preferences of the median voter are fulfilled. We expect higher public HCE before elections.

The partisan approach focuses on the strong impact of party ideology. As a result, platforms and policies will not converge. Instead, left and right[3] politicians will provide different policies by concentrating on the preferences of their partisans. The left party appeals more to the labor base and promotes expansionary policies, whereas the right party appeals more to capital owners and is therefore more concerned with keeping inflation down. This holds for both sub-approaches of the partisan theory - for the classical one installed by Hibbs (1977) as for the rational one

[3] We will use the terms "left" and "right" instead of the potential alternatives "left-wing" and "right-wing" for simplicity reasons.

developed by Alesina (1987). Therefore our prospect is that party composition and respective ideologies of the governments affect public HCE.[4] We expect higher public HCE under left than right governments.[5]

Another political determinant stems from the literature of fiscal policy. It arises from the "common pool problem" discussed e. g. by Weingast et al. (1981) and implies that decision costs increase with the number of decision makers. This also refers to the logic of logrolling. For example, the collective action literature implicates that the more dispersed the decision-making authority, the higher the budget deficit. Also the amount of government expenditures is expected to be higher the more parties form a government. Tsebelis (1995) is associated with this so called early veto player theory. He claims that the potential of a policy change decreases with the number of veto players, the lack of congruence (dissimilarity of policy positions among veto players) and the internal cohesion (similarity of policy positions among the constituent units of each veto player) of these players. However, this is just the one side of the coin. The second effect claimed by most recent applications points out that policy stability increases with the number of veto players (Tsebelis (2002)). There might be a lock-in effect: Countries with more veto players have consistently low, or, consistently high deficits. Stability might increase with the number of coalition partners. Overall, the final impact remains as an empirical question. As coalition partners also have to find agreements how they will spend their revenues, we expect that the type of government, namely the number of coalition partners as well as the fact if the ruling government has a majority in parliament (minority government) affect public HCE.

2.2 The role of government in health politics

The role of government in health politics might be doubtful: First, is there any motivation for politicians to do different health politics? And second, if so, are politicians really free to choose? What about the real room of manoeuvre? Immergut (1992) indeed gives good explanations for both of the questions in her book "Health Politics". First, she states: „National health insurance symbolizes the great divide between liberalism and socialism, between the free market and the planned economy….Political parties look to national health insurance programs as a vivid expression of their distinctive ideological profiles and as an effective means of getting

[4] This implies that there is divergence of policies and platforms. Theoretically, in a simple two party model, ideology must over compensate the vote maximizing effect in this case. In a multi party model, manifoldness and traditions of the parties are assumed to avert policy convergence. See e. g. Mueller (2003): Chapters 11-13 and Persson and Tabellini (2000): Chapters 3 and 5 for an overview of the respective fundamental literature on party competition. The current paper is not eligible to discuss the impact of ideology, what it means or where and it comes from.

[5] The literature on the partisan theory has become much more comprehensive during the last decades, of course. We just reminded the beginnings but still highly relevant papers of the debate.

votes…National health insurance, in sum, is a highly politicized issue." (Immergut (1992: 1)). She also provides a comprehensive scheme of the role of government in health politics. Thereby, she divides the role of government into that of a payer, regulator, owner and employer. The government might give subsidies to private organizations or levy payroll tax to pay for public insurance or even all HCE.[6] Government regulation might affect insurers, patients, doctors and hospitals. There might be public ownership of hospitals etc. and the public sector might also function as an employer. Of course, the design of the health system and respective programs will differ from country to country in empirical studies. Poterba (1995) distinguishes between three possible instruments in health policy: Price subsidies, government mandates and public provision. Comparing these instruments, mandates do not affect the government's budget. Public provision gives governments greater control over the nature of the services individuals consume, but also causes inefficiencies due to the monopoly. Lastly, the institutional setting strongly affects health policy. In particular, interest group activities influence political decisions. These veto players might mitigate politicians' room of manoeuvre. But we also stress to support our argument that governing parties and their respective networks will be able to conduct staffing policies influencing the veto players in favour of their own interests.

A further potential caveat against the analysis might be that in federal states, the counties have certain competences (for example regarding hospitals) and therefore the federal government is not alone responsible for all decisions driving public HCE. In fact, county governments also have an impact and room of manoeuvre in respective states. But first, the federal governments will have the power to influence this room of manoeuvre and even affect decisions in the counties. They might negotiate or determine global budgets for hospitals as well as general subsidy levels etc. (e. g. Vrangbæk and Christiansen (2005) for the case of Denmark and Lægreid et al. (2005) for the case of Norway). Second, important competences like designing health insurance remain with the federal governments.

Overall, we remark that the theoretical background on the political economy of health is somewhat sparse. Current theoretical work mostly refers to the optimal design of health insurance and their financing (see e.g. Breyer (1995), Breyer and Haufler (2000) and Kifmann (2005)). However, there seems to be no model that explains the interaction of political decision makers, their party ideologies, elections etc. and health.

[6] Note that Immergut (1992: 42 ff.) distinguishes between three kinds of programs: mutual fund subsidies, national health insurance and national health service.

2.3 Case Studies

This sub section will present some case studies of OECD countries. It will motivate in which respect health has been a political and polarizing issue or if the rise of HCE just has been a result of path dependency.[7] We refer to a very fruitful debate in the "Journal of Health Policy, Politics and Law" on potential reforms of the health system and the respective developments of the health systems in the single countries. Path dependency is a dominant explanation for the development in health policy, but there are differences between the single countries and time periods.[8] That is why we will present and point out particular policy differences between left and right governments.

DeVoe's (2003) case study of the 1973 Australian Community Health Program (CHP) illustrates that health has been indeed a very political issue in Australia. She states that "in the 1969 and 1972 federal elections, a revitalized Australia Labor Party (ALP), led by Gough Whitlam and focused on social and political change, began to talk seriously about health care reform…Soon after the ALP victory in 1972, community health advocates outlined the CHP as a way to "expand and co-ordinate community health services" and to give grants in support of "alternative methods of delivering health care"" (DeVoe (2003: 78 f.)). Considering the last decades in general, "the center of gravity has shifted back and forth between the public and private sectors as control of the commonwealth (federal) government has alternated between Labour and Coalition (right-of-center) parties" (Tuohy et al. (2004: 368)). Furthermore, we will not only stress the different preferences and policies of left and right parties, but also point out that health might also be an important issue in election campaigns. DeVoe (2003: 93 f.): "By October 1969, an Australian Gallup poll reported that 54 percent of Australians polled preferred the Labor Party proposal for a "free" system of basic medical and hospital care with a compulsory levy, compared with only 37.6 percent who preferred the Liberal Party's voluntary health insurance schemes."
Also in New Zealand health emerges as a highly political issue (Laugesen (2005)). Health care reforms in 1986 to 1988, which used a corporatization model, failed. The labor government lost the elections in 1990, and the newly elected National Party announced reductions to social welfare benefits and promised to reform the health care system. The election in 1996 affected the National Party's health policies because it had to build a coalition with the conservative New Zealand First Party. Competition between hospitals was abandoned. After the election in 1999,

[7] "Path dependency argues that once a particular path has been chosen, in this case the delegation of the state authority to sickness fund and provider organizations, it is difficult to leave that path. However, path dependency also suggests that timing and historical sequences may be crucial to any political process" (Altenstetter and Busse (2005: 128)).
[8] The related literature on HCE also points out the heterogeneity across the countries regarding the provision of health.

the new left coalition wanted to establish a health service based on "co-operation and collaboration" to replace "the current commercial and competitive model" (Laugesen (2005: 1078)).

Things seem to be different in the US because voters consider health different from other social welfare policies (Schlesinger and Lee (1993)). "Health care in the United States is associated with support for equal opportunity, whereas more overtly redistributive policies are associated with the characteristics of the recipients of the services. People are less tolerant when it comes to redistributive public programs for the poor and more tolerant of health care programs" Laugesen (2005: 1080). This is interesting because these preferences will affect real health policy and we generally expect significant differences between Democrats and Republicans in economic and social policy. In general, the health system in the US is somewhat different, as, for example, there is no national health insurance (e.g. Blake and Adolino (2001), Comanor et al. (2006)).

In Sweden, health care is characterized by continuity and certain core values like equality of all citizens and security. This is closely related to politics: "The step-by-step construction of health security has been one of the most important achievements of both health and welfare-state policy during the seventy years of Social Democratic political hegemony in Swedish national politics" (Saltman and Bergman (2005: 260 f.)).

Lægreid et al.'s (2005) paper indeed supports the query of the current paper examining the Norwegian hospital reform at the beginning of this millennium. In general, Norway has a history of a relatively decentralized and welfare-oriented health care system like Sweden and Denmark. But then a reform process started in the mid-nineties. Lægreid et al.'s (2005: 1032) claim: "The introduction of the enterprise model is thus part of a larger shift in the Norwegian public administration system. It can partly be seen as an ideological change toward neoliberalism and private sector models in Norwegian political parties in general, including the Labor Party. In contrast to the centralized planning state of the past, marked competition and management became the order of the day."

There are further case studies on other OECD countries (e. g. Altenstetter and Busse (2005) for Germany, Vrangbæk and Christiansen (2005) for Denmark, Bevan and Robinson (2005) for England, Rico and Costa-Font (2005) for Spain)) that make clear in which sense health was a polarizing political issue or not. Overall, the given case studies should have demonstrated that

asking for the impact of political determinants on health is an interesting and not even trivial issue.

3. Data

3.1 Data set and descriptive statistics

The data set contains yearly data for public HCE of 18 OECD countries. It is provided by the OECD Health Data Base (2007). The countries included are Australia, Austria, Canada, Denmark, Finland, Germany, Iceland, Ireland, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, the United Kingdom and the USA. The panel is mostly balanced from 1970 to 2004. We will examine public HCE as a share of GDP. Therefore real terms are analyzed and our examination is similar to the studies concerning social expenditures. Figure 1 illustrates the respective development in time elapsed. On average[9], the expenditure share increased from 3.6 per cent in 1971 to 6.8 per cent in 2004. We further stress the development in Australia, New Zealand, Sweden and the USA as illustrative examples (case studies). The USA spent much less than the average for a long time, but they measured up with the average in 2004. In contrast, the share of public HCE on GDP was much higher in Sweden than on average. Further, Figure 1 indeed illustrates the expansionary policies in Australia in the beginnings of the seventies and also the volatility in New Zealand.

For completeness, Figure 2 shows the shares of the public on total health care expenditures. Only 40 percent of the total health care expenditures were public in the USA, while the share was about 70 percent on average. In contrast, Sweden had a very high share between 80 and 90 percent. The share of public expenditures in New Zealand was high in the eighties. In Australia, there was always somewhat less spent by the public sector than on OECD average. In conclusion, most of the health care expenditures were public, so that their examination emerges as important.

Figures 1 and 2 about here

3.2 Time series properties

The time series properties of the single variables emerge as very crucial for the econometric specifications. The literature on HCE pointed out that previous results might fundamentally change due to the inclusion of non-stationary variables in the model. It might cause spurious

[9] Note that there are not always data available for all the 18 countries from 1971 to 2004. We adjust the average respectively.

regression that we have to avoid. Testing for stationarity of the time series, we apply a battery of panel unit root tests as well as separate unit root tests on the single country series. The advantage of the panel unit root tests compared to the univariate counterparts is to gain statistical power. However, the tests to a panel also relate to asymptotic theory and therefore loose power in small samples. Breitung and Pesaran's (2005) overview on unit roots and cointegration in panels points out, that the respective tests refer to samples where the time dimension (T) and the cross section dimension (N) are relatively large. However, as it is common in the literature on HCE, we will carefully apply the battery of respective tests, but will also stress that the results should be handled somewhat carefully due to the small sample sizes. Most recently, Hartwig (2007a) also discussed the use and interpretation of the panel unit root tests in his application on total health care expenditures. The appendix provides our several test results in detail and comments on the chosen procedures. In conclusion, we highly recommend to estimate the model in first differences.

4. The empirical model

4.1 Model set up

The basic (static) econometric panel data model is set up as follows:

$$\Delta \log \text{Public HCE}_{it} = \Sigma_j \alpha_j \text{ Political Variable}_{ijt} + \Sigma_k \beta_k \Delta \log X_{ikt} + u_t$$

$i = 1,\ldots,18; j = 1,\ldots,4; k = 1,\ldots,7; t = 1,\ldots,35$

where the dependent variable $\Delta \log \text{Public HCE}_{it}$ denotes the first differences of the change in public health care expenditures as a share of GDP. Political Variable$_{ijt}$ introduces the political variables, on which this study focuses. The next paragraph describes its coding in some more detail. $\Sigma_k \Delta \log X_{ikt}$ contains the exogenous control variables (as well as a constant dependent on the estimation method). The inclusion of particular explanatory variables emerges as very fundamental because there is no consensus. That is why we apply the following procedure for a sophisticated analysis. At first we will consider public HCE as a share of social expenditures. As there is a line of literature on social expenditures we follow the related studies including the three accepted control variables: The lagged first differences of the change in GDP per capita ($\Delta \log GDP_{t-1}$), the change in the unemployment rate (Δlog Unemployment) and the change of the dependency ratio measured as the share of the citizens aged above 64 and below 14 (Δlog Dependency Ratio). For this reason, the general economic situation, the situation of the labor market and demographic development are taken into account. Note that GDP in period t forms the denominator of the dependent variable. Thus the model uses the GDP growth (per capita) in

period t-1 as explanatory variable to avoid endogeneity problems. It also enters the regression in real terms. We follow the recommendation of the OECD not to convert variables into PPPs in international comparisons.[10] Further the dependent variable is expressed in shares, so that deflating is not an issue there.

But moreover, the literature explaining the rise of total HCE is highly alive and researchers still figure out what really drives this development. In the last years, GDP was the only overall accepted explanatory variable. Recently, Hartwig (2007a) has shown that total HCE are driven by wage increases in excess of productivity growth. This application requires nominal data. However, we do not examine total but public HCE in the current paper. Of course, they are highly related and therefore we might refer to the respective literature including further explanatory variables that might be sensible in the current framework. We try to avoid omitted variable bias using alternative specifications. It will never be reasonable to test all explanatory variables that were suggested for total (not public!) HCE during the last years. Gassebner et al. (2007) figure out the determinants of health care expenditures using Extreme Bounds Analysis (EBA) and Bayesian Averaging of Classical Estimates (BACE). In particular, we first refer to Hartwig (2007a) and include the compensation of employees (per capita and in real terms). In addition, controlling for the interaction with the private sector we include the sum of private HCE (per capita and in real terms). We do not include private HCE as a share of GDP to avoid endogeneity problems.

Furthermore, (public) HCE are a component of the government expenditures by function (COFOG). Dreher et al. (2007) as well as Shelton (2007) examine the composition of government expenditure and we follow this literature to include further explanatory variables. First, we control for the total population in the single countries, complementing the dependency ratio. Second, public expenditures and respective changes in health policy might be affected by globalization. Therefore, we follow Dreher et al. (2007) and include the KOF index of globalization (see Dreher (2006a) and Dreher et al. (2008)). Alternatively, one could use trade-openness as measure of globalization. We comment on the respective regressions in section 5.3. In total, we will present our basic specifications referring to the literature of social expenditures as well as the alternative with the further control variables.

[10] See Ahmad et al. (2003)

4.2 Political variables

Political Variable$_{ijt}$ is in the centre of our analysis. We distinguish between a variable controlling for the effect of election years, the ideological party composition of the governments, the number of coalition partners as well as the fact if the respective governments had a majority in parliament or not (minority government).

The variable Election$_{it}$ takes the exact timing of the elections into account. Following Franzese (2000), it is calculated as

$$\text{Election}_{it} = [(M-1) + d/D]/12$$

where M is the month of the election, d is the day of the election and D is the number of days in that month. In all other years, its values are set to zero. Therefore, we directly control for fluctuations and the fact that the election dates differ between as well as in the single countries. We follow recent studies like Huber et al. (2003) who focus on electoral budget cycles and argue that if at all, these cycles should be observed only occasionally and should not be very large. Therefore, we will only use this electoral variable first (compare section 5.1.2).

An important challenge for the partisan test in an OECD panel is the heterogeneity of the parties and parliamentary systems in the single states. Hence the question comes up what kind of government could be labelled left or right – especially when there are more than two parties in government with different ideological roots. Bjørnskov (2005a: 4) concludes on this issue: "Political ideology is a potentially complex feature yet operationalizing it as a unidimensional construct measurable in a left-to-right scheme hence need not necessarily entail any sizeable loss of information or sophistication when connected to real political outcomes." Researchers often use the index by Budge et al. (1993) and updated by Woldendorp et al. (1998) and (2000) as a measure of the governments' ideological positions.[11] It locates the cabinet on a left-right scale with values between 1 and 5. It takes the value 1 if the share of right parties in terms of seats in government and their supporting parties in parliament is larger than 2/3, 2 if it is between 1/3 and 2/3. The index is 3 in a balanced situation if the share of centre parties is 50 per cent, or if the left- and right parties form a government together not dominated by one or the other side. Corresponding to the first two cases it takes the values 4 and 5 by a dominance of the left parties

[11] Note that Bjørnskov (2005b) recently introduced a further cross-country indicator of political ideology for the period from 1976 to 2000. It refers to the data base by Beck et al. (2001) and places the parties on a discrete left-to-right scale where left parties are assigned the value -1, center parties 0 and right parties 1. Lastly the value of the government ideology g_t is the weighted sum of the respective ideologies of the three largest parties in government.

likewise defined. Following this procedure, Potrafke (2007) applied an ideological index for a group of OECD countries in the period from 1980 to 2003. It is extended for the current analysis. Consequently, we get a uniform quantitative measure. Finally, we label years in which the government changed corresponding to the one that was in office for the longer period, e. g. when a right government followed a left one in August, we label this year as left. Note that the coding of the ideology variable implies a positive impact on public HCE due to the discussion in section 2.

Finally, the type of government is tested by two variables whereas previous studies used just one variable. Roubini and Sachs (1989) constructed an index of power dispersion which distinguishes between the number of coalition partners as well as if the government was a minority government. Unfortunately, this procedure mixes the quantitative feature of the number of parties in the coalition with a qualitative feature, namely if this government has a majority in parliament or not (Edin and Ohlsson (1991)). Therefore, we first install a variable controlling for the number of parties in government. It ranges from 0 (no coalition) to 2 (huge coalition):

0 one-party majority parliamentary government;
1 coalition parliamentary government with two-to-three coalition partners;
2 coalition parliamentary government with four or more coalition partners;

Further we use a simple dummy variable to control for the impact of minority governments. It takes on the value "1" when the government does not have a majority in parliament and zero otherwise.

4.3 Suitable panel data methods

The potential panel data estimation methods suitable in the current framework must be briefly discussed. Taking first differences due to stationarity reasons of the single series eliminates time-invariant fixed effects. Hence, the common least squares dummy variable estimator (fixed-effects) could be useless. But there could also be time trends in each country, so that first differencing just eliminates the time-invariant country effects, but not the individual time components. Thus, it might also be sensible to apply fixed-effects on the first differences. Random effects could be present, too, because we do not examine all OECD countries.

Alternatively, the model could be estimated using a dynamic panel data framework. However, in the context of dynamic estimation, the common fixed-effect estimator is biased. As Behr (2003)

states, the estimators taking into account the resulting bias can be grouped broadly into the class of instrumental estimators and the class of direct bias corrected estimators. In accordance with large sample properties of the GMM methods, e. g. the estimator proposed by Arellano and Bond (1991) will be biased in the current framework with N = 18. That is why bias corrected estimators might be a good choice. Bruno (2005) presents a bias corrected least squares dummy variable estimator for dynamic panel data models with small N. This paper wants to test for the impact of the political variables in a robust econometric framework. That is why the following section will present results of different estimation methods and thereby clarify the sturdiness of the results.

5. Results

5.1 The period from 1970 to 2004

5.1.1 Basic Scenario

Table 1 shows the regression results and reports three econometric specifications, respectively. Referring to the static scenario, the F-Tests do not reject the hypothesis that fixed effects are zero. However, we further tested if estimating with a common constant might be more efficient than estimating random effects or rather OLS is biased compared to random effects. We conclude that estimating random effects is most appropriate, but however, note that the results referring to OLS and random effects are very similar or even identical. Furthermore, we detected autocorrelation of first order in the residuals and correct for it using panel corrected standard errors (Beck and Katz (1996)). Moreover, Table 1 reports the coefficients and t-ratios in absolute terms for every single equation. By interpreting the coefficients, one has to be careful. First, we took logarithms of the levels so that the coefficients of the control variables would reflect elasticities. In addition, we applied first differences because of stationarity reasons. Thus, the estimated coefficients report the relative changes of the growth rates of the public HCE. We will comment on the interpretation of the political variables below.

Table 1 about here

The results show that there were indeed political effects on public HCE from 1970 to 2004. The first three specifications report a statistical significant positive effect of the election year variable. The effect is somewhat weaker using the further control variables. Hence the results in Table 1 provide evidence for an electoral cycle: Politicians seemed to increase spending in election years in the time period from 1970 to 2004. Overall, we would conclude that they affected the preferences of the median voter and behaved opportunistically. Furthermore, we expected left

governments to increase public HCE relative to right governments. The results do not fulfil our prospects. There are no statistically significant effects. In contrast, the type of government variables mattered. There was a negative effect of the coalition size on public HCE (static models). Regarding the first specification, minority governments are also reported to decrease public HCE. Hence theses findings support the theoretical hypothesis, that stability increased, the higher the number of coalition partners. We interpret this effect in the sense that bigger coalitions are expected to have broader majorities in parliament and therefore could even decrease public HCE (see also section 5.2). In comparison to very thin majorities they are not that dependent on all the votes of their members of parliament. Minority governments do not have anything to loose and therefore also could slightly decrease expenditures.

5.1.2 Pre-determined election dates and endogeneity

The impact of the electoral effects might depend on the fact if the election dates are predetermined; that is if the particular elections were part of the regular electoral cycle or if they were irregular. Shi and Svensson (2006) examine political budget cycles and point out that the election timing might be endogenous. They argue that both timing of elections and fiscal policies could be influenced by a number of variables, which are not included in the regression. This might cause omitted variable bias. Mitigating this potential problem Shi and Svensson (2006) provide a sensitivity analysis focusing on elections whose timing is predetermined relative to current fiscal policies. Their results do not change for the whole sample but for developed countries. Brender and Drazen (2005) argue that there are two conceptual problems with Shi and Svensson's (2006) presumption. First, it may not be that obvious to distinguish between systems in which electoral dates are fixed and systems where early elections may be called. In the same manner, early elections seem to be the rule rather than the exception. Furthermore, there are countries where the government may call early elections, but rarely does. Second, "there is no clear theoretical presumption about whether fiscal manipulation will be stronger or weaker when election dates are effectively predetermined" (Brender and Drazen (2005: 1282)). However, Brender and Drazen (2005) also control for predetermined elections and find that results are not much affected. In conclusion, distinguishing between regular and irregular elections seems very reasonable from the contents. Thus, we will also consider it in the current paper. We applied Shi and Svensson's (2006) data on the predetermined and endogenous election years from 1975 to 1995.[12] Furthermore we extend the respective data from 1970 to 1974[13] and from 1996 to 2004

[12] We thank Min Shi and Jakob Svensson for providing their data.

[13] Note that even the Political Handbook from 1976 does not exactly identify the general elections in Finland and Japan 1972 as well as the election in Canada in 1974 as endogenous. They are highly expected to be endogenous, but

using the Political Handbooks, following Shi and Svensson's (2006: 1374) rules. An election is classified to be predetermined if either (i) the election is held on the fixed date (year) specified by the constitution; or (ii) the election occurs in the last year of a constitutionally fixed term for the legislature; or (iii) the election is announced at least a year in advance. Overall, we detect 63.6 percent of the elections as pre-determined.

Table 2 about here

Table 2 points out that the conclusion on the electoral cycle was spurious. In fact, the positive effect of election years on public HCE was driven by endogenous elections. The pre-determined election year variables turned to be insignificant at convenient significance levels. It is implausible that politicians could exploit the endogeneous elections for short-dated health policy. Thus, we cannot conclude that there is evidence for an opportunistic behaviour of politicians.

5.2 Different policy periods: Expansionary policies till the nineties and responsibility afterwards?

Previous research examining social policy has shown empirically that there were differences between the seventies and eighties compared to the nineties (e.g Garrett (1998)[14], Kittel and Obinger (2003), Potrafke (2007)). This is highly motivated by the historical events in the time period from 1970 to 2004. In 1990, there was the fall of the "Iron Curtain"; the end of the "Cold War" arose in these years. Garret (1998: 1) states that "…one should be recitent to conclude differently about the 1990s because of the highly idiosyncratic nature of the decade in Europe". In addition, the nineties were also claimed as the end of the welfare states. Hence, the historical background provides good reasons to examine respective sub-periods. Thus, we will test for potential differences and distinguish between the two sub periods: From 1970 to 1990 and from 1991 to 2004. Interestingly, we indeed detect the beginning of the nineties as a turning point. The following results also hold when we distinguish between the period from 1970 to 1989 and from 1990 to 2004. But effects vanish by e.g. extending the first sub period to 1993.

Tables 3 and 4 about here

Tables 3 and 4 point out that the ideological orientation of the government mattered: Left governments increased public HCE in the period from 1970 to 1990, but decreased it from 1991

theoretically, they could have been announced one year in advance. Then we would have to label them as predetermined. However, this would not affect our inferences.

[14] Garrett (1998) devotes a whole chapter to the situation after 1990.

to 2004. Further regressions on smaller sub periods demonstrate that especially the seventies were the decade with very expansionary expenditure policies. Moreover, the spurious electoral cycle is detected to be driven by the nineties. Regarding the type of government variables, the results demonstrate that bigger coalitions did not significantly decrease spending in the times of the "golden age" till 1990. This was different in the nineties, as the negative impact turned to be significant. We might interpret this effect in favour of more responsibility, although minority governments did not significantly decrease spending. We will comment on the numerical meaning of the ideology and size of coalition effects and determine the marginal effects. They will tell us, by how much percent the growth rate of the public HCE has changed when the respective policy variable changed by one point. For example, the ideology variable might increase from 3 (left- and right parties in government) to 4 (left government). Considering an average ideology variable coefficient of (-) 0.006, this means that the growth rate of the public HCE has changed by (-) 0.6 percent.

Overall, our results indeed provide evidence for a policy change. In this respect, they match the evidence of the related literature on social expenditures: Left governments expanded the welfare state in the times of the "golden age". However, regarding the regression results it would be imprecise to conclude that they became responsible in the nineties because there are indeed statistical significant negative effects which resemble the positive ones in absolute values. Interpreting this finding, we first have to concede that our analysis does not control for party changes in time elapsed. In particular, parties might simply have changed their preferences. Potrafke (2007b) develops a procedure for the construction of a dynamic ideology index and applies it to German data. It exactly controls for this shortcoming. However, dynamic indices would also not justify negative impacts of left governments on HCE to be in line with the partisan approach. The next section provides interesting explanations for the negative impacts in the nineties in the current analysis. Overall, the results seem to be in accordance with the claim that health is a special commodity and politicians – left- as well as right – take care on respective issues.

5.3 Sensitivity to single countries

Following the anecdotal evidence from the case studies, the results might be sensitive to particular countries. That is why we were running regressions excluding one single country by another. This common test emerges as very crucial in the current framework and therefore also refers to the claim of the related literature on HCE that the provision of health is somewhat heterogeneous across the countries (see e. g. Gerdtham and Jönsson (2000)). In particular, this

analysis impressively confirms the descriptions from the case studies: Health is a polarizing issue in Australia and New Zealand, but less in the USA. Table 5 reports the regression results for the period from 1970 to 1990 when the USA are excluded. In this case the impact of the ideology variable becomes stronger – numerically as well as regarding the statistical significance. Hence left governments increased public HCE more intensely. In other words, the Democrats in the USA did not spend significantly more (or even less) than the Republicans. Then Table 6 refers to the period from 1991 to 2004 when the USA are excluded. The negative impact of the ideology variable turns less significant. Hence the USA somewhat caused the extreme policy change effect, that left governments spent significantly less than right governments in the nineties.

Tables 5 to 8 about here

Things are totally different when New Zealand is excluded from the panel (Tables 7 and 8). We focus on this case because we get remarkably effects in both sub periods. The ideology variable became insignificant from 1970 to 1990. Thus, health was indeed a strong polarizing issue in New Zealand in the times of the "golden age": Left governments spent more for public health than right governments did (Table 7). Interestingly, our results in Table 8 demonstrate that there was no policy shift in New Zealand in the period from 1991 to 2004. When New Zealand is excluded in this period, the negative impact of the ideology variable turns much stronger numerically and statistical significance increases. Thus, left governments also spent more for public health compared to right governments in the nineties.

Excluding Australia from the sample from 1970 to 1990 also turns down the impact of the ideology variable to be insignificant as in Table 7. Hence our findings indicate that left governments increased spending for public health compared to right governments in this period. However, in contrast to New Zealand, policy changed in the nineties. Left governments did not still spend more.

The statistical significance of the negative impacts of left governments in the nineties in the overall sample is indeed surprising. Thus, we will detect which countries drove this effect. Moreover this finding somewhat contradicts the results of the previous literature on social expenditures. For example, Potrafke (2007a) also detects a policy change in the nineties, but the effects are not that strong. The reason is the composition of the OECD panel. In the current analysis, Iceland and Norway are highly responsible for the effects shown. Both countries are not included in Potrafke's (2007a) analysis of social expenditures in 20 OECD countries. In Iceland,

the share of public expenditures on GDP increased from 7.1 percent in 1991 to 8.5 percent in 2004 under a right government. The conservative government in Norway also strongly increased spending when they came in office in the second half of 1997. These developments contradict the spending preferences according to the partisan approach. They further explain our findings in more detail and again demonstrate the peculiarity of health.

Running regressions without Sweden resulted in much smaller t-statistics of the minority variable from 1991 to 2004. This fits the fact that minority governments frequently arose in Sweden. The general impact of the size of coalition variable is not fundamentally mitigated by a single country. Lastly, results on the whole sample are not sensitive to single countries.

Overall, our results from the regressions excluding single countries are highly in line with the case studies. We can indeed detect that health was a polarizing issue in some countries, whereas left and right politicians seemed to do the same policy in other countries.

We also checked specifications when the ideology variable was interacted with the minority government variable. A possible prospect might be that left and right governments might enforce their ideology, when their parties have a majority in parliament and vice versa. The results could not confirm this expectation. Lastly, using time dummies for the eighties and nineties could affect the results on the whole sample. We checked dummies for the periods till 1989, 1990 and after 1989 as well as 1990. They are insignificant and do not all affect our inferences.

The previous sections were already a kind of robustness check for our results. However, we finally comment on further robustness due to the control variables. First our two different model specifications have shown that the policy impacts even become more significant in the second specifications using more explanatory variables. The results therefore refuse the general caveat that the reported effects are only due to the lack of potential explanatory variables.

Moreover, in line with the related studies the dependency ratio did not turn out to be very significant.[15] However, a variable that controls for the group of transfer receivers is sensible in the current regression. In further specifications, we used the share of the citizens aged 65 and above (old age population) as well as citizens aged 15 and below of the whole population instead

[15] Note that this might be due to the fact that the demographic change just started in the considered period from 1980 to 2003. Hence the regression result does not necessarily falsify that the increasing share of old age people might cause higher social expenditures.

of the dependency ratio (Shelton (2007)). Both variables were highly insignificant and do not change our inferences. Alternatively, we included the old age population in thousands, not as a share. The latter turned out to be weakly significant at the conventional levels. It affects the results only marginally and fortifies our conclusions. We further replaced the KOF index of globalization by trade. It also affected public HCE negatively and this replacement does not change our conclusions regarding the ideology and type of government variables. Interestingly, including trade instead of the KOF index of globalization causes the pre-determined election year variables to be significant at a 10 per cent level in some specifications for the period from 1970 to 1990. Using the economic, social and political KOF sub indices of globalization instead of the overall index does not change our inferences. The KOF index of economic globalization drives the negative impact of globalization on public HCE.

The measurement of GDP is not self-determining and its inclusion in respective regressions might be sloppy sometimes. It has to be in constant prices, of course. Following the related literature, we included GDP per capita (in local currencies). Results are nearly not at all affected, when we use GDP per capita in US Dollars instead. Moreover, GDP in absolute terms somewhat changes the point estimates, only very slightly affect the other variables, but does not change the inferences.

Moreover, we were running regressions using levels instead of first differences (several combinations: between levels of the dependent variables as well as the independent ones). This procedure will prevent any caveats against the regression in first differences and refers to the respective literature on HCE. We indeed get indications for spurious regression: E. g. the R^2 reached one and the t-statistics of the control variables become extremely high. This confirms our chosen specification in first differences.

6. Conclusion

This paper examined policy effects on public HCE in OECD countries from 1970 to 2004. Two impulses highly encouraged this analysis. First, social policy only slightly functions as object of investigation in empirical political economics. In particular, the impact of political determinants was mostly discovered in a general sense, focusing on social policy or rather expenditures in general. We claimed that it might be of importance to investigate specific fields in more detail. Case studies on OECD countries encouraged our examination of health policy. Health emerged as very interesting due to its special characteristics, respective challenges due to the demographic change etc., but also because of its monetary meaning. The latter also motivated the second

impulse: Researchers still search for explanations of the rise in HCE (recently e. g. Hartwig (2007a) and Hartwig (2007b)).

Our results illustrated that policy affected public HCE. However, the electoral cycle with higher expenditures in election years emerged as spurious. In line with previous literature on the impact of government ideology on the welfare state activities, our findings reported that left governments increased spending for health till 1990. After the "golden age" they turned to be more responsible and even decreased public HCE. The findings also point out that public HCE decreased, the higher the number of coalition partners (and minority governments). Interestingly, this effect was mainly driven by the nineties. Hence bigger coalitions seemed to have used their comfortable majorities in parliament for somewhat unpopular retrenchments. Moreover, health was detected to be a polarizing political issue in countries like Australia and New Zealand. In contrast, our results show that left and right politicians in the USA did not differ in their respective health policies. Our results strongly fit the anecdotal evidence given by single case studies. Overall, the findings indicate no steady political driving factor on the rise of public HCE in the period from 1970 to 2004. They further seem to confirm the special characteristics of the commodity health.

Appendix: Unit root tests

We apply a battery of panel unit root as well as tests on the single country series. The following tables report the results of the panel unit root tests on the public HCE as a share of GDP as well as the tests on the respective series of GDP per capita, unemployment, the dependency ratio, compensation of employees, private health care expenditures per capita, the KOF index of globalization as well as total population. They refer to the test on the first differences. We applied the Levin et al. (2002), Im et al. (2003) and the Fisher tests referring to Maddala and Wu (1999) and Choi (2001). In contrast, the Hadri (2000) test uses the null hypothesis that there is no unit root. Breitung and Pesaran (2005) provide a detailed description of the recent panel unit root tests. Further, see also Hartwig (2007a) for a brief description. The results were obtained using Eviews 5.1. In comparison to STATA 9.1, Eviews 5.1. allows to apply the respective tests on unbalanced panels, it considers an automatic lag length selection by the use of Information Criteria and also contains the Breitung (2000) test. Regarding the first three tests listed in the table, maximum lag lengths are automatically selected based on the Schwarz Information Criterion. The remaining two tests use the Bartlett kernel for the Newey-West bandwidth selection. The probabilities for the Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality (See Hartwig (2007: Appendix)).

Table 9: Results of the panel unit root tests. Public HCE, GDP and unemployment

	log(public HCE)			log(GDP)			Log(unemployment)		
H0: Unit root in first diff.	Stat.	Prob.	Obs.	Stat.	Prob.	Obs.	Stat.	Prob.	Obs.
Levin, Lin & Chu t*	-13.032	0.000	591	-12.634	0.000	626	-11.664	0.000	601
Im, Pesaran & Shin W-stat	-12.675	0.000	591	-12.900	0.000	626	-14.281	0.000	601
ADF-Fisher Chi-square	228.332	0.000	591	226.319	0.000	626	256.242	0.000	601
PP-Fisher Chi-square	276.803	0.000	600	238.900	0.000	627	232.198	0.000	607
H0: No unit root in first diff.									
Hadri Z-stat	1.443	0.075	607	2.257	0.0120	628	2.752	0.030	611

log(public HCE) = log of public HCE as a share of GDP, log(GDP) = log of GDP per capita,
log(unemployment) = log of unemployment rate

Table 10: Results of the panel unit root tests. Dependency ratio, compensation of employees, private HCE

	log(dependency_ratio)			log(comp_employees)			log(private HCE)		
H0: Unit root in first diff.	Stat.	Prob.	Obs.	Stat.	Prob.	Obs.	Stat.	Prob.	Obs.
Levin, Lin & Chu t*	-1.491	0.068	616	-11.180	0.000	595	-14.304	0.000	593
Im, Pesaran & Shin W-stat	-1.610	0.054	616	-11.428	0.000	595	-15.698	0.000	593
ADF-Fisher Chi-square	41.305	0.250	616	196.266	0.000	595	288.938	0.000	593
PP-Fisher Chi-square	37.856	0.387	616	187.375	0.000	598	330.776	0.000	601
H0: No unit root in first diff.									
Hadri Z-stat	4.752	0.000	617	1.463	0.072	614	3.981	0.000	610

log(dependency_ratio) = log of the dependency ratio, log(comp_employees) = log of compensation of employees, log(private HCE) = log of private HCE per capita

Table 11: Results of the panel unit root tests. Population and KOF index of globalization

	log(population)			log(IOG)		
H0: Unit root in first diff.	Stat.	Prob.	Obs.	Stat.	Prob.	Obs.
Levin, Lin & Chu t*	-3.764	0.001	628	-19.369	0.000	593
Im, Pesaran & Shin W-stat	-6.715	0.000	628	-18.897	0.000	593
ADF-Fisher Chi-square	123.386	0.000	628	340.025	0.000	593
PP-Fisher Chi-square	113.297	0.000	628	350.362	0.000	593
H0: No unit root in first diff.						
Hadri Z-stat	-0.391	0.652	628	-0.733	0.7682	611

log(population) = log of (total) population, log(IOG) = log of the KOF index of globalization

Tables 9 to 11 report the results of different unit root tests and demonstrate that we can always reject the null hypotheses of a unit root in first differences except for the dependency ratio (see below). However, the Hadri tests indicate that regarding public HCE, GDP, the unemployment rate, compensation of employees and private HCE, there are still unit roots in first differences. Overall, we conclude from these tests that the time series in first differences are stationary. Furthermore, we applied ADF- and KPSS-Tests on the single series. They also confirm the results above.

The current tests show that the first differences are mostly detected to be stationary. However, at first, we applied the respective tests on the level series, of course. At this stage, the inclusion of a deterministic trend in the test regression emerges as crucial. There are pros and cons to include linear time trends testing for unit roots in time series in levels. Statistically, the plots of the series demonstrate their rise in time elapsed. Furthermore including a trend is necessary so that the process can mirror the data under the alternative hypothesis. This definitely demands the inclusion of linear time trends. From the contents, one might argue that linear time trends must be excluded because the respective variables cannot steadily increase, e. g. the rise of public HCE could not be infinite. As a result, we believe in the inclusion of a linear trend in the test regression

in levels. Moreover, taking first differences eliminates linear time trends so that we did not include them in the test regressions in first differences. Note that the dependency ratio is an exception. There is no strong trending behavior and hence we do not include a linear trend in the test regression in levels. The series were (mostly) reported to be I(0). However, we will include it in first differences for consistency reasons, running the risk of overdifferentiation.

Finally, the applied battery of panel unit root tests is standard and fits the ones in the existing literature. More sophisticated tests (as described in Breitung and Pesaran (2005)) do not seem necessary in the current paper. In particular, so called second generation panel unit root tests might be applied, that take into account the fact that the time series might not be independent across i, but contemporaneously correlated. However, Breitung and Pesaran (2005: 19) claim that "the literature on modelling of cross section dependence in large panels is still developing". The named tests suggest that estimating in first differences will be the best specification. In addition, ADF and KPSS-Tests on the single country series identified most of the series as I(1). Thus, we are indeed confident estimating the model in first differences due to the results of the statistical tests named above. Moreover, one might put doubt on the inference of any unit root test due to the relatively small number of observations in the sample. In this case, researchers might refer to their empirical intuition specifying the model. We indeed strongly believe that using first differences is the most appropriate way in the current framework.

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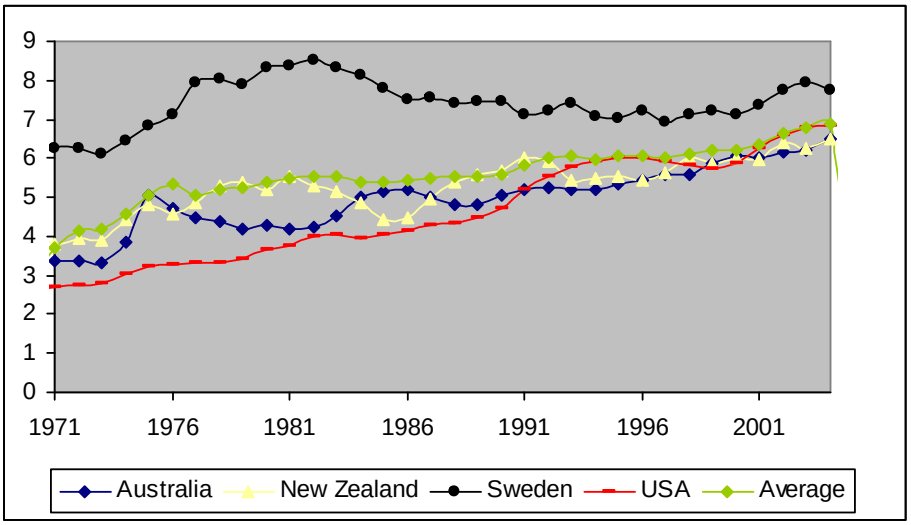
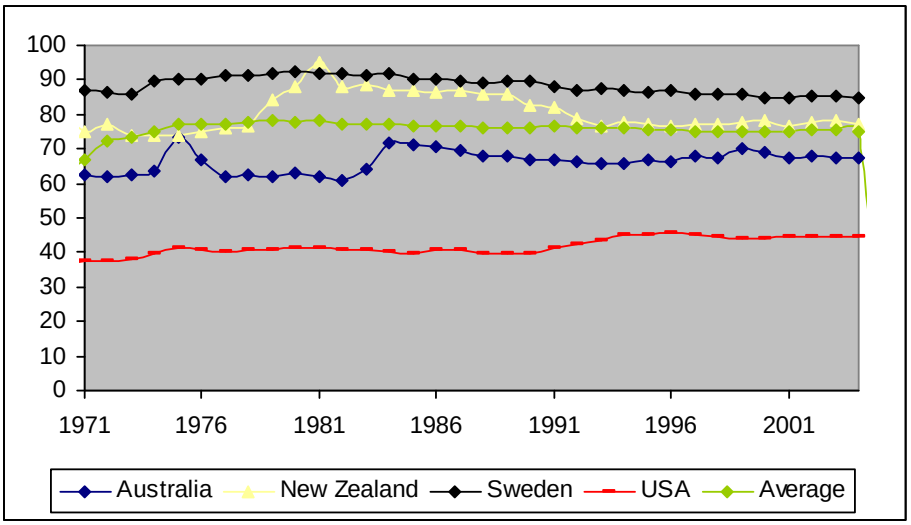
Figure 1: Public HCE in relation to GDP. 1971-2004.
(average of the 18 countries, Australia, New Zealand, Sweden and the USA)



Source: OECD Health Data Base (2007)

Figure 2: Public in relation to total HCE.1971-2004.
(average of the 18 countries, Australia, New Zealand, Sweden and the USA)



Source: OECD Health Data Base (2007)

Table 1. Regression Results. 1970-2004. Dependent Variable: Δlog Public HCE (as a share of GDP)

	(1) RE	(2) PCSE	(3) DYN	(4) RE	(5) PCSE	(6) DYN
Election	0.0149**	0.0139**	0.0166**	0.0110*	0.0101	0.0121*
	[2.15]	[2.15]	[2.41]	[1.66]	[1.60]	[1.67]
Ideology	0.0011	0.0007	0.0014	0.0016	0.0015	0.0012
	[0.46]	[0.25]	[0.48]	[0.72]	[0.59]	[0.50]
Size of Coalition	-0.0077**	-0.0077**	-0.0047	-0.0068**	-0.0071**	-0.0019
	[2.30]	[2.14]	[0.85]	[2.08]	[2.08]	[0.35]
Minority Government	-0.0093*	-0.0087	-0.0099	-0.0063	-0.0059	-0.0037
	[1.81]	[1.55]	[1.14]	[1.24]	[1.13]	[0.47]
Δlog GDP_{t-1}	0.5679***	0.5989***	0.6363***	0.2603**	0.3411***	0.3327***
	[5.80]	[5.85]	[5.86]	[2.42]	[3.08]	[2.83]
Δlog Dependency Ratio	0.3221*	0.3245	0.4069*	0.248	0.2628	0.3218
	[1.68]	[1.40]	[1.89]	[1.34]	[1.22]	[1.54]
Δlog Unemployment	0.0728***	0.0733***	0.0769***	0.0902***	0.0896***	0.0978***
	[6.98]	[6.91]	[7.04]	[8.49]	[8.35]	[8.18]
Lagged Dependent Variable			0.1244***			0.1221***
			[2.85]			[2.99]
Δlog Comp. of Employees				0.4722***	0.4273***	0.4990***
				[5.97]	[4.94]	[6.38]
Δlog Private HCE				-0.0481***	-0.0452***	-0.0457***
				[3.37]	[3.24]	[3.19]
Δlog Population				0.7540*	0.7111	0.9027*
				[1.94]	[1.48]	[1.78]
Δlog Index of Globalization				-0.1021	-0.1157	-0.1291*
				[1.38]	[1.50]	[1.69]
Constant	0.005	0.0055		-0.0033	-0.0031	
	[0.62]	[0.62]		[0.38]	[0.32]	
Observations	587	587	572	577	577	571
R-squared	0.11	0.11		0.18	0.18	
Number of n	18	18	18	18	18	18

Notes: Absolute value of t statistics in brackets (absolute values); * significant at 10%; ** significant at 5%; *** significant at 1%

Table 2. Regression Results. 1970-2004. Dependent Variable: Δlog Public HCE (as a share of GDP). Predetermined and endogenous elections.

	(1) RE	(2) PCSE	(3) DYN	(4) RE	(5) PCSE	(6) DYN
Election (predetermined)	0.0117	0.009	0.0126	0.0071	0.0052	0.0067
	[1.40]	[1.18]	[1.57]	[0.89]	[0.70]	[0.71]
Election (endogenous)	0.0217**	0.0234**	0.0245**	0.0206**	0.0212**	0.0239**
	[2.09]	[2.25]	[2.22]	[2.08]	[2.12]	[2.21]
Ideology	0.0012	0.0007	0.0014	0.0018	0.0016	0.0012
	[0.50]	[0.28]	[0.47]	[0.78]	[0.64]	[0.48]
Size of Coalition	-0.0076**	-0.0076**	-0.0047	-0.0068**	-0.0070**	-0.002
	[2.28]	[2.12]	[0.86]	[2.07]	[2.07]	[0.36]
Minority Government	-0.0098*	-0.0093	-0.0108	-0.0068	-0.0065	-0.0048
	[1.89]	[1.64]	[1.25]	[1.34]	[1.24]	[0.60]
Δlog GDP_{t-1}	0.5644***	0.5953***	0.6349***	0.2560**	0.3384***	0.3297***
	[5.77]	[5.81]	[5.85]	[2.39]	[3.05]	[2.80]
Δlog Dependency Ratio	0.3206*	0.3232	0.4044*	0.2496	0.2648	0.3209
	[1.67]	[1.40]	[1.88]	[1.35]	[1.22]	[1.54]
Δlog Unemployment	0.0729***	0.0737***	0.0768***	0.0904***	0.0900***	0.0979***
	[6.99]	[6.95]	[7.04]	[8.52]	[8.40]	[8.19]
Lagged Dependent Variable			0.1267***			0.1253***
			[2.91]			[3.06]
Δlog Comp. of Employees				0.4732***	0.4273***	0.5018***
				[5.99]	[4.94]	[6.39]
Δlog Private HCE				-0.0481***	-0.0454***	-0.0461***
				[3.37]	[3.28]	[3.21]
Δlog Population				0.7704**	0.7261	0.9321*
				[1.98]	[1.51]	[1.84]
Δlog Index of Globalization				-0.1039	-0.1179	-0.1310*
				[1.41]	[1.53]	[1.72]
Constant	0.0048	0.0054		-0.0038	-0.0034	
	[0.59]	[0.60]		[0.44]	[0.36]	
Observations	587	587	572	577	577	571
R-squared	0.11	0.12		0.19	0.18	
Number of n	18	18	18	18	18	18

Notes: Absolute value of t statistics in brackets (absolute values); * significant at 10%; ** significant at 5%; *** significant at 1%

Table 3. Regression Results. 1970-1990. Dependent Variable: Δlog Public HCE (as a share of GDP). Predetermined and endogenous elections.

	(1) RE	(2) PCSE	(3) DYN	(4) RE	(5) PCSE	(6) DYN
Election (predetermined)	0.0163	0.0148	0.018	0.0094	0.0085	0.0079
	[1.37]	[1.40]	[1.51]	[0.84]	[0.84]	[0.69]
Election (endogenous)	0.017	0.0176	0.021	0.0162	0.0163	0.0224*
	[1.23]	[1.22]	[1.47]	[1.25]	[1.20]	[1.65]
Ideology	0.0057*	0.0057	0.0058	0.0070**	0.0071**	0.0063
	[1.71]	[1.53]	[1.40]	[2.20]	[2.06]	[1.57]
Size of Coalition	-0.0059	-0.0064	-0.0081	-0.005	-0.0058	-0.0054
	[1.28]	[1.43]	[0.97]	[1.12]	[1.36]	[0.66]
Minority Government	-0.0103	-0.0098	-0.0097	-0.0051	-0.0048	0.0037
	[1.32]	[1.19]	[0.90]	[0.67]	[0.65]	[0.36]
Δlog GDP_{t-1}	0.6610***	0.6805***	0.6911***	0.3790***	0.4461***	0.4156***
	[4.89]	[4.85]	[4.74]	[2.65]	[3.02]	[2.87]
Δlog Dependency Ratio	0.2698	0.2359	0.3394	0.0239	0.018	0.0763
	[0.94]	[0.76]	[1.00]	[0.09]	[0.06]	[0.23]
Δlog Unemployment	0.0722***	0.0727***	0.0767***	0.0901***	0.0897***	0.1008***
	[5.58]	[5.65]	[5.70]	[6.94]	[6.97]	[7.41]
Lagged Dependent Variable			0.1186*			0.1236**
			[1.95]			[2.19]
Δlog Comp. of Employees				0.4916***	0.4485***	0.5456***
				[4.99]	[4.03]	[5.36]
Δlog Private HCE				-0.0455***	-0.0431***	-0.0418**
				[2.81]	[2.84]	[2.33]
Δlog Population				0.9642*	0.8675	0.966
				[1.77]	[1.29]	[1.15]
Δlog Index of Globalization				-0.1636	-0.1965*	-0.1997**
				[1.58]	[1.81]	[1.99]
Constant	-0.0139	-0.0142		-0.0285**	-0.0279**	
	[1.22]	[1.16]		[2.39]	[2.17]	
Observations	339	339	325	330	330	325
R-squared	0.14	0.14		0.24	0.23	
Number of n	18	18	18	18	18	18

Notes: Absolute value of t statistics in brackets (absolute values); * significant at 10%; ** significant at 5%; *** significant at 1%

Table 4. Regression Results. 1991-2004. Dependent Variable: Δlog Public HCE (as a share of GDP). Predetermined and endogenous elections.

	(1) RE	(2) PCSE	(3) DYN	(4) RE	(5) PCSE	(6) DYN
Election (predetermined)	0.0023	0.0003	0.0013	0.0017	-0.0013	-0.0007
	[0.21]	[0.03]	[0.10]	[0.15]	[0.13]	[0.06]
Election (endogenous)	0.0397**	0.0404***	0.0361**	0.0400**	0.0406***	0.0349*
	[2.52]	[2.73]	[1.99]	[2.53]	[2.62]	[1.85]
Ideology	-0.0061*	-0.0073**	-0.0055	-0.0063**	-0.0069**	-0.0062*
	[1.90]	[2.24]	[1.36]	[1.98]	[2.23]	[1.72]
Size of Coalition	-0.0129***	-0.0123**	-0.0004	-0.0133***	-0.0130**	0.0000
	[2.67]	[2.19]	[0.04]	[2.76]	[2.48]	[0.00]
Minority Government	-0.0075	-0.0071	-0.0037	-0.0072	-0.007	-0.0074
	[1.15]	[1.00]	[0.30]	[1.09]	[1.04]	[0.54]
Δlog GDP_{t-1}	0.4391***	0.4562***	0.5491***	0.1727	0.2013	0.2469
	[2.88]	[2.80]	[2.74]	[1.01]	[1.13]	[1.42]
Δlog Dependency Ratio	0.1944	0.2724	0.3265	0.2502	0.3226	0.3393
	[0.66]	[0.81]	[0.76]	[0.86]	[0.99]	[0.75]
Δlog Unemployment	0.0760***	0.0729***	0.0760***	0.1051***	0.1041***	0.1063***
	[3.66]	[3.34]	[2.73]	[4.67]	[4.40]	[3.67]
Lagged Dependent Variable			0.1757**			0.1564**
			[2.52]			[2.34]
Δlog Comp. of Employees				0.5030***	0.4981***	0.5357***
				[3.43]	[3.22]	[3.35]
Δlog Private HCE				-0.0787*	-0.0732	-0.0626
				[1.78]	[1.64]	[1.32]
Δlog Population				0.4266	0.4693	0.6897
				[0.79]	[0.80]	[0.77]
Δlog Index of Globalization				-0.0179	0.0361	-0.0258
				[0.17]	[0.35]	[0.20]
Constant	0.0338***	0.0367***		0.0312**	0.0316***	
	[3.03]	[3.27]		[2.50]	[2.59]	
Observations	248	248	230	247	247	229
R-squared	0.11	0.11		0.16	0.16	
Number of n	18	18	18	18	18	18

Notes: Absolute value of t statistics in brackets (absolute values); * significant at 10%; ** significant at 5%; *** significant at 1%

Table 5. Regression Results. 1970-1990. USA excldluded. Dependent Variable: Δlog Public HCE (as a share of GDP). Predetermined and endogenous elections.

	(1) RE	(2) PCSE	(3) DYN	(4) RE	(5) PCSE	(6) DYN
Election (predetermined)	0.0186	0.0173	0.0225	0.011	0.0114	0.0129
	[1.43]	[1.46]	[1.59]	[0.85]	[1.01]	[0.94]
Election (endogenous)	0.0194	0.0192	0.0212	0.0197	0.0183	0.0228*
	[1.37]	[1.33]	[1.49]	[1.42]	[1.33]	[1.68]
Ideology	0.0073**	0.0073*	0.0068*	0.0095**	0.0087**	0.0074*
	[2.06]	[1.86]	[1.67]	[2.40]	[2.45]	[1.89]
Size of Coalition	-0.004	-0.0046	-0.0073	-0.0058	-0.0038	-0.0044
	[0.84]	[0.98]	[0.92]	[0.73]	[0.87]	[0.59]
Minority Government	-0.0092	-0.0087	-0.0098	0.0047	-0.0037	0.0036
	[1.15]	[1.05]	[0.84]	[0.40]	[0.51]	[0.33]
Δlog GDP_{t-1}	0.7015***	0.7190***	0.7187***	0.3709**	0.4569***	0.4166**
	[4.93]	[4.87]	[4.39]	[2.33]	[2.93]	[2.38]
Δlog Dependency Ratio	0.2708	0.2316	0.3501	0.1333	-0.0207	0.0411
	[0.89]	[0.72]	[0.89]	[0.38]	[0.07]	[0.11]
Δlog Unemployment	0.0710***	0.0713***	0.0742***	0.0933***	0.0884***	0.0975***
	[5.28]	[5.43]	[5.27]	[6.68]	[6.81]	[7.04]
Lagged Dependent Variable			0.1176**			0.1235**
			[2.07]			[2.29]
Δlog Comp. of Employees				0.5413***	0.4775***	0.5662***
				[5.17]	[4.23]	[5.25]
Δlog Private HCE				-0.0431**	-0.0429***	-0.0410**
				[2.56]	[2.84]	[2.16]
Δlog Population				0.7437	0.7759	0.921
				[0.89]	[1.15]	[1.07]
Δlog Index of Globalization				-0.1733	-0.1838*	-0.1910*
				[1.58]	[1.67]	[1.83]
Constant	-0.0222*	-0.0224*		-0.0376**	-0.0365***	
	[1.78]	[1.67]		[2.37]	[2.69]	
Observations	318	318	305	310	310	305
R-squared	0.14	0.14		0.26	0.24	
Number of n	17	17	17	17	17	17

Notes: Absolute value of t statistics in brackets (absolute values); * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6. Regression Results. 1991-2004. USA exclduded. Dependent Variable: Δlog Public HCE (as a share of GDP). Predetermined and endogenous elections.

	(1) RE	(2) PCSE	(3) DYN	(4) RE	(5) PCSE	(6) DYN
Election (predetermined)	0.0029	0.0011	0.0027	0.0031	0.0006	0.0012
	[0.24]	[0.09]	[0.20]	[0.25]	[0.05]	[0.09]
Election (endogenous)	0.0401**	0.0407***	0.0355**	0.0397**	0.0405***	0.0339*
	[2.50]	[2.74]	[2.14]	[2.47]	[2.60]	[1.76]
Ideology	-0.005	-0.0060*	-0.0043	-0.005	-0.0055*	-0.0047
	[1.48]	[1.79]	[0.89]	[1.48]	[1.69]	[1.07]
Size of Coalition	-0.0116**	-0.0110*	0.0004	-0.0123**	-0.0121**	0.0009
	[2.26]	[1.89]	[0.04]	[2.37]	[2.24]	[0.10]
Minority Government	-0.0075	-0.007	-0.0044	-0.0077	-0.0075	-0.0081
	[1.10]	[0.98]	[0.30]	[1.11]	[1.11]	[0.59]
Δlog GDP_{t-1}	0.4422***	0.4563***	0.5331***	0.1491	0.1761	0.1991
	[2.82]	[2.77]	[2.67]	[0.85]	[0.97]	[0.94]
Δlog Dependency Ratio	0.1297	0.1938	0.2175	0.1784	0.2359	0.2106
	[0.43]	[0.57]	[0.50]	[0.59]	[0.72]	[0.52]
Δlog Unemployment	0.0733***	0.0707***	0.0736**	0.1049***	0.1037***	0.1070***
	[3.44]	[3.21]	[2.54]	[4.54]	[4.35]	[3.40]
Lagged Dependent Variable			0.1560**			0.1328*
			[2.26]			[1.78]
Δlog Comp. of Employees				0.5452***	0.5361***	0.5865***
				[3.61]	[3.40]	[3.15]
Δlog Private HCE				-0.0783*	-0.0744	-0.0616
				[1.73]	[1.64]	[1.27]
Δlog Population				0.4285	0.4432	0.8047
				[0.76]	[0.74]	[0.80]
Δlog Index of Globalization				-0.0141	0.0307	-0.0188
				[0.13]	[0.30]	[0.16]
Constant	0.0294**	0.0316***		0.0262**	0.0264**	
	[2.50]	[2.72]		[1.99]	[2.12]	
Observations	234	234	217	233	233	216
R-squared	0.10	0.10		0.16	0.15	
Number of n	17	17	17	17	17	17

Notes: Absolute value of t statistics in brackets (absolute values); * significant at 10%; ** significant at 5%; *** significant at 1%

Table 7. Regression Results. 1970-1990. New Zealand excldluded. Dependent Variable: Δlog Public HCE (as a share of GDP). Predetermined and endogenous elections.

	(1) RE	(2) PCSE	(3) DYN	(4) RE	(5) PCSE	(6) DYN
Election (predetermined)	0.0155	0.0138	0.0172	0.0113	0.0104	0.0108
	[1.21]	[1.22]	[1.25]	[0.95]	[0.97]	[0.82]
Election (endogenous)	0.0188	0.0192	0.0243*	0.0175	0.0176	0.0253*
	[1.36]	[1.32]	[1.67]	[1.36]	[1.28]	[1.85]
Ideology	0.0034	0.0034	0.0031	0.0038	0.004	0.0027
	[0.98]	[0.88]	[0.72]	[1.14]	[1.15]	[0.68]
Size of Coalition	-0.007	-0.0074	-0.0095	-0.0063	-0.0068	-0.0067
	[1.49]	[1.64]	[1.12]	[1.41]	[1.62]	[0.81]
Minority Government	-0.011	-0.0104	-0.0104	-0.0057	-0.0054	0.0024
	[1.40]	[1.26]	[0.93]	[0.76]	[0.75]	[0.23]
Δlog GDP_{t-1}	0.6641***	0.6674***	0.7154***	0.3634**	0.4119***	0.4383**
	[4.77]	[4.61]	[4.23]	[2.49]	[2.71]	[2.51]
Δlog Dependency Ratio	0.2313	0.2082	0.2789	-0.0522	-0.0502	-0.014
	[0.80]	[0.67]	[0.80]	[0.19]	[0.18]	[0.04]
Δlog Unemployment	0.0854***	0.0864***	0.0882***	0.1107***	0.1104***	0.1203***
	[5.81]	[5.79]	[5.24]	[7.47]	[7.66]	[6.84]
Lagged Dependent Variable			0.1148*			0.1106**
			[1.93]			[2.09]
Δlog Comp. of Employees				0.5574***	0.5190***	0.5969***
				[5.41]	[4.40]	[5.18]
Δlog Private HCE				-0.0530***	-0.0489***	-0.0512***
				[2.91]	[2.88]	[2.78]
Δlog Population				0.9853*	0.9271	0.8365
				[1.75]	[1.35]	[0.99]
Δlog Index of Globalization				-0.1652	-0.1864*	-0.1962*
				[1.58]	[1.68]	[1.70]
Constant	-0.0071	-0.0068		-0.0209*	-0.0208	
	[0.60]	[0.55]		[1.69]	[1.60]	
Observations	319	319	306	310	310	306
R-squared	0.14	0.14		0.26	0.25	
Number of n	17	17	17	17	17	17

Notes: Absolute value of t statistics in brackets (absolute values); * significant at 10%; ** significant at 5%; *** significant at 1%

Table 8. Regression Results. 1991-2004. New Zealand excldluded. Dependent Variable: Δlog Public HCE (as a share of GDP). Predetermined and endogenous elections.

	(1) RE	(2) PCSE	(3) DYN	(4) RE	(5) PCSE	(6) DYN
Election (predetermined)	0.0096	0.0072	0.0085	0.01	0.0067	0.0078
	[0.81]	[0.66]	[0.64]	[0.84]	[0.62]	[0.59]
Election (endogenous)	0.0370**	0.0376**	0.0343**	0.0393**	0.0402**	0.0355*
	[2.29]	[2.44]	[2.03]	[2.40]	[2.51]	[1.89]
Ideology	-0.0094***	-0.0105***	-0.0088*	-0.0094***	-0.0100***	-0.0094**
	[2.71]	[3.02]	[1.81]	[2.72]	[3.02]	[2.09]
Size of Coalition	-0.0164***	-0.0158***	-0.0095	-0.0164***	-0.0163***	-0.0087
	[3.23]	[2.71]	[0.79]	[3.18]	[2.99]	[0.78]
Minority Government	-0.0069	-0.0064	-0.0024	-0.0067	-0.0065	-0.0066
	[1.04]	[0.90]	[0.18]	[0.97]	[0.96]	[0.48]
Δlog GDP_{t-1}	0.4383***	0.4564***	0.5367***	0.1801	0.2149	0.2473
	[2.78]	[2.73]	[2.70]	[1.02]	[1.17]	[1.28]
Δlog Dependency Ratio	0.3493	0.4222	0.4802	0.3932	0.4635	0.4769
	[1.16]	[1.26]	[1.20]	[1.31]	[1.42]	[1.21]
Δlog Unemployment	0.0693***	0.0670***	0.0706**	0.1013***	0.1006***	0.1047***
	[3.24]	[3.00]	[2.45]	[4.34]	[4.14]	[3.45]
Lagged Dependent Variable			0.1731**			0.1540**
			[2.54]			[2.07]
Δlog Comp. of Employees				0.5132***	0.5047***	0.5508***
				[3.42]	[3.22]	[3.03]
Δlog Private HCE				-0.0858*	-0.0826*	-0.0752
				[1.86]	[1.77]	[1.47]
Δlog Population				0.4132	0.4285	0.5849
				[0.66]	[0.62]	[0.51]
Δlog Index of Globalization				0.0153	0.0678	0.0034
				[0.14]	[0.66]	[0.03]
Constant	0.0455***	0.0481***		0.0412***	0.0420***	
	[3.69]	[3.89]		[3.07]	[3.26]	
Observations	234	234	217	233	233	216
R-squared	0.12	0.12		0.18	0.17	
Number of n	17	17	17	17	17	17

Notes: Absolute value of t statistics in brackets (absolute values); * significant at 10%; ** significant at 5%; *** significant at 1%

Data description and sources

I. Dependent variables and control variables

Variable	Description	Source
Public health care expenditures	Public expenditure on health Public current expenditure on health Public investment on medical facilities Public expenditure on • personal health care • medical services • curative and rehabilitative care • long-term nursing care • ancillary services • services not allocated by function • in-patient care • curative and rehabilitative in-patient care • long-term nursing in-patient care • day care • curative and rehabilitative day care • long-term nursing day care • out-patient care • physician services • dental services • (all other public expenditure on out-patient care) • home health care • curative and rehabilitative home care • long-term nursing home care • ancillary services • clinical laboratory • diagnostic imaging • patient transport and emergency rescue • (All other public miscellaneous ancillary services) • medical goods • pharmaceuticals and other medical non-durables • prescription medicines • over-the-counter medicines • other public medical non-durables • therapeutic appliances and other medical durables • collective health care • prevention and public health • health administration and insurance • preventive-curative health care • health R&D • long term care • current health and LTC expenditure • social services of LTC • hospitals' services • services of nursing and residential care facilities • services of ambulatory health care providers • (for) retail sale and other providers of medical goods • services of public health organisations • services of public health administration • health services of other industries as a share of GDP	OECD Health Data Base (2007)

Gross domestic product (per capita)	GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant local currency.	Worldbank (2007)
Unemployment Rate	Total unemployment, % of labor force	OECD Health Data Base (2007)
Dependency Ratio	Population ages 15 to 64 is the percentage of the total population that is in the age group 15 to 64.	OECD Health Data Base (2007)
Compensation of Employees	The total remuneration in cash, or in kind, payable by enterprises to employees in return for work done by the latter during the accounting period (this includes contributions, paid or imputed, in respect of their employees to social security schemes and to private pension, family allowance, casualty insurance, life insurance and similar schemes). per capita, NCU at 2000 GDP price level	OECD Health Data Base (2007)
Private health care expenditures	Private expenditure on health Private current expenditure on health Private investment on medical facilities Private expenditure on • personal health care • medical services • curative and rehabilitative care • long-term nursing care • ancillary services • services not allocated by function • in-patient care • curative and rehabilitative in-patient care • long-term nursing in-patient care • day care • curative and rehabilitative day care • long-term nursing day care • out-patient care • physician services • dental services • (all other Private expenditure on out-patient care) • home health care • curative and rehabilitative home care • long-term nursing home care • ancillary services • medical goods • pharmaceuticals and other medical non-durables • prescription medicines • over-the-counter medicines • other Private medical non-durables • therapeutic appliances and other medical durables • collective health care • prevention and public health • health administration and insurance • preventive-curative health care • long term care • current health and LTC expenditure • social services of LTC • hospitals' services • services of nursing and residential care facilites • services of ambulatory health care providers	OECD Health Data Base (2007)

	• (for) retail sale and other providers of medical goods • services of Private health organisations • services of Private health administration • health services of other industries per capita, constant prices, national currencies	
Population	Total population	OECD Health Data Base (2007)
KOF Index of Globalization	The KOF Index of Globalization was introduced in 2002 (see Dreher, 2006a). The overall index covers the economic, social and political dimensions of globalization. It defines globalization to be the process of creating networks of connections among actors at multi-continental distances, mediated through a variety of flows including people, information and ideas, capital and goods. Globalization is conceptualized as a process that erodes national boundaries, integrates national economies, cultures, technologies and governance and produces complex relations of mutual interdependence. More specifically, the three dimensions of the KOF index are defined as: ♦ *economic globalization*, characterized as long distance flows of goods, capital and services as well as information and perceptions that accompany market exchanges; ♦ *political globalization*, characterized by a diffusion of government policies; and ♦ *social globalization*, expressed as the spread of ideas, information, images and people.	Dreher, Axel (2006a): Does Globalization Affect Growth? Evidence from a new Index of Globalization, *Applied Economics 38*, 10: 1091-1110. Updated in Dreher, Axel, Noel Gaston and Pim Martens (2008), Measuring Globalization, forhtcoming