The Size and Composition of Government Spending in Europe and its Impact on Well-being

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Abstract

This paper empirically analyzes whether the growth of public sector size in Europe over the past few decades reflects efficient responses to a changing economic and social environment or whether it indicates an increase in wasteful spending. In order to resolve this important issue, the effect of government involvement on subjective well-being is estimated in a panel of 15 European countries. Life satisfaction data is used as a proxy for well-being and is based on the answers given by 299,823 respondents in the Eurobarometer Survey from 1997 till 2004. The investigation reveals that the answer to the question above depends on institutional factors such as government effectiveness, government ideology and the extent to which democratic rights exist and are used by the public. A second question that arises is whether the government's ability to create well-being differs across several areas of intervention. Social protection expenditure appears to have no significant relationship with well-being, while health expenditure has a significantly negative impact on life satisfaction even when controlling for health status. Moreover, there is evidence for multi-peaked preferences with respect to public provision of education since a low or a high amount of education expenditure maximizes well-being.

JEL Classification: H11, H40, H50, I00, I31

Keywords: Life satisfaction, government expenditure, government size

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1 Introduction

The fact that European governments have grown dramatically since World War II cannot be questioned. In 1960, government expenditure on average amounted to 27 percent of output, while in recent years it has reached almost half of the GDP (Mueller, 2003; Persson, 2002). In light of the heavy tax burden that a representative European citizen is consequently facing it needs to be established why the government can raise and enforce a claim to a considerable part of people's incomes. The benefit principle of taxation provides an answer to this question by stating that tax collection by a public entity is justified if society at large receives an adequate reimbursement in the form of publicly provided goods and services in return for the taxes paid (Lindahl, 1919). Following this argumentation, it is important to test whether people do benefit from the state sector in terms of higher well-being. As an extension to this, one may wonder in which fields of intervention the government possesses the biggest capability to satisfy the desires and needs of its citizens.

Yet, the question whether representatives of the public sector exclusively seek to maximize social welfare is subject to debate. The traditional welfare economic view, assumes the existence of a benevolent and omniscient social planner who ensures the achievement of a first-best allocation of resources (Pareto, 1906). However, this view has been challenged by the public choice school, which emphasizes agency problems as the source of inefficient outcomes. One of the main ideas of this school of thought is that politicians and/or bureaucrats have personal interests that give rise to a deviation from the optimal size of the state sector (Mueller, 2003). Thus, by testing the impact of government size on life satisfaction one is indirectly testing whether this kind of selfish and irresponsible behavior is actually observed in reality.

In order to analyze the general societal impact of the size and functional composition of public spending, life satisfaction is regarded as a proxy for subjective well-being. This is in line with the field of Happiness Research that has gained ever more attention and acceptance over the past few decades (Di Tella and MacCulloch, 2006; Frey and Stutzer, 2002). More specifically, the empirical analysis in this paper draws on a panel of European countries (a list of these countries is included in the appendix) running from 1997 to 2004.

To date, only few researchers have investigated the relationship between public spending and well-being. Bjørnskov et al. (2007) conduct a worldwide cross-country study and find that life satisfaction decreases with government consumption, whereas government capital formation and social spending appear to have no effect. Hence, their article suggests that the aforementioned benefit principle of taxation is violated with respect to government consumption. This is contradicted by Di Tella and MacCulloch (2005)[1] who find a positive but insignificant effect of government consumption on life satisfaction in a panel dataset covering 10 OECD countries. With regard to aggregate public spending in the analysis by Bjørnskov et al. (2007) it might however be that marginal costs and benefits are approximately equal and that the benefit principle of taxation is therefore fulfilled[2]. The investigation at hand employs total public spending divided by GDP as a proxy for government size and regards a homogeneous set of European countries similar to Di Tella and MacCulloch (2005).

There are also a number of papers that analyze the impact of specific types of government expenditure on well-being in isolation. Veenhoven (2000) investigates the relationship between social security expenditure and well-being for a worldwide set of countries and finds no significant correlation between the two, whereas Kotakorpi and Laamanen (2007) exclusively focus on health expenditure in Finland and find a positive effect on well-being. Consequently, it seems that not only the total level of public spending but also the magnitudes

[1] Di Tella and MacCulloch (2005) use government consumption as a control variable when investigating the impact of inflation and unemployment on the well-being of left- and right-wingers.

[2] The authors do not investigate the relationship between total government spending and well-being. Yet, given the results that they do report, it is unlikely that an aggregated measure yields a positive effect.

of its individual components matter. In order to further investigate the individual effects, these two types of expenditure and a number of additional spending categories are included in the regression analysis. The disaggregation of public spending by Bjørnskov et al. (2007) into government consumption, investment and social spending is vague since the diving lines between these categories are somewhat blurred. For instance, education expenditure can both be seen as an investment into human capital and as a means of redistribution. Consequently, the paper at hand uses an alternative disaggregation of public spending.

This paper suggests that the effect of public sector size on well-being depends crucially on the extent of government effectiveness and participatory democracy and the ideology of the strongest political parties. Furthermore, interesting insights are gained by considering components of public spending that are characterized by strong redistributive effects: education, health and social protection expenditure (Blomquist and Christiansen, 1995; Boadway and Marchand, 1995[3]). The latter has no impact on well-being, while there is a U-shaped relationship between spending on education and well-being. This may be interpreted as evidence for multi-peaked preferences. Health expenditure has a negative effect on well-being even when controlling for health status. Summarizing, this paper makes a contribution to the existing literature by providing a comprehensive analysis on the impact of both the size and the composition of public expenditure on life satisfaction.

The analysis is structured as follows: Section 2 gives an overview of theoretical considerations and states several hypotheses. Section 3 describes the dataset and presents the empirical strategy, while section 4 reports the results. In addition, several robustness checks are carried out. Finally, section 5 concludes the analysis.

2 Theoretical considerations

According to the welfare economic view a benevolent social planner representing the government ensures a first-best allocation of resources. For instance, Pigou (1947) describes how the government would levy an optimal corrective tax in the presence of externalities, whereas Samuelson (1954) states the condition that determines which quantity of a public good is optimal. If the government truly acts in this way, one may come to the conclusion that the marginal impact of government size on well-being is positive. On the other hand, it may be that the marginal cost and the marginal benefit of government size are equal when an equilibrium point is achieved. These considerations can be summarized as follows:

H_{1a}**:** Well-being is either positively or not at all affected by government size.

The underlying assumptions of perfect information and an absence of personal motives that characterize the welfare economic view are both discarded by proponents of the public choice school. Instead, they highlight inefficiencies and suboptimal outcomes caused by the propensity of politicians and bureaucrats to maximize their personal utility and not that of society. As a result, the public choice school suggests that the state sector will be too large and that resources will be misallocated. The literature describes many causes for these inefficiencies. An important one are specific interest groups and the ways in which they succeed in pushing through their interests. Firstly, Tullock (1959) draws the attention to the logrolling phenomenon which may lead to the implementation of public projects which benefit specific interest groups, but not society at large. In addition, Persson and Tabellini (2000) discuss models focusing on legislative bargaining, lobbying and elec-

[3] Based on a theoretical model Boadway and Marchand (1995) argue that governments achieve a great share of their redistributive goals through public expenditures on education, health care and pensions.

toral competition that illustrate additional mechanisms for an inefficient and asymmetric allocation of publicly provided goods and services.

The behavior of bureaucrats and politicians provides another cause for excessive and inefficient public spending. Firstly, Niskanen (1971) puts forward a theoretical model illustrating that bureaucrats have an incentive to expand their budgets beyond the social optimum. It appears that non-pecuniary goals of bureaucrats such as prestige and power are positively correlated with larger budgets for the provision of a public good. Hence, the bureaucrat demands the largest budget - given the information asymmetry concerning the cost function of the public good - which the politician would approve of. Brennan and Buchanan (1980) depict the government as a Leviathan that maximizes its revenue by exploiting the tax base to the full extent. Eventually, this leads to excessively large budgets. Nordhaus (1975) delivers an additional reason for excessive public spending and discusses the existence of political business cycles where politicians - presented as selfish maximizers of re-election probabilities - tend to increase expenditure before elections. It follows that:

H_{1b}**:** Well-being is negatively affected by government size.

The next hypothesis provides an extension to the first one and relates to subcategories of government expenditure. With respect to education expenditure the effect on well-being seems to be quite clear. Public expenditure on education represents an investment in human capital from which people benefit through higher self-confidence (Hvide, 2003)[4] and better prospects on the job market (Coelli et al., 2007)[5]. Therefore, a positive correlation with life satisfaction is to be expected.

For other types of expenditure the effects are less clear-cut. The following considerations are therefore only suggestive: In Europe, costs in the health sector have exploded in the past few years due to an increase in obesity and related diseases (Sander and Bergemann, 2003) and a higher share of old people. Since physical and mental health deteriorate with age, the elderly need more nursing care and other social services, relatively expensive technology and long periods of hospitalization (World Bank, 1993). The strong degree of indirect redistribution involved and occurrences of moral hazard may cause an inefficiently high level of expenditure. In this case a negative marginal effect on well-being may prevail. On the other hand, health is something that is very fundamental for well-being as it determines whether certain restrictions are imposed on the way people live. If more health expenditure means that people enjoy a better health status, a positive impact on well-being might as well be plausible. A similarly ambiguous prediction applies to social protection expenditure. It represents a mere redistribution of resources which might create undesired incentives (Meyer, 1990)[6]. On the other hand, it provides insurance and reduces the fear of economic deprivation due to unemployment. These considerations imply:

H_2**:** Education expenditure has a positive marginal effect on well-being, while the marginal impacts of social protection and health expenditure are ambiguous.

[4] Hvide (2003) argues that education affects people's occupational choice by strengthening their self-confidence and providing them with information about their abilities.

[5] Making use of a unique panel dataset linking high school and welfare receipt records in British Columbia, the authors find that graduation reduces the probability of welfare receipt by 1/2 to 3/4.

[6] Higher benefits are found to have a strong negative effect on the probability of leaving unemployment. However, the probability of finding a job rises dramatically just prior to when benefits lapse.

3 Data and model specification

3.1 Description

Figure 1 provides a first glimpse at the generally positive relationship between government size and well-being. To the right is Sweden with a government size beyond 60 percent, while on the left there is Ireland with values below 35 percent. Furthermore, the dots at the top represent Denmark with a share of 'very satisfied' people beyond 60 percent and at the bottom are Portugal and Greece with shares below 10 percent.

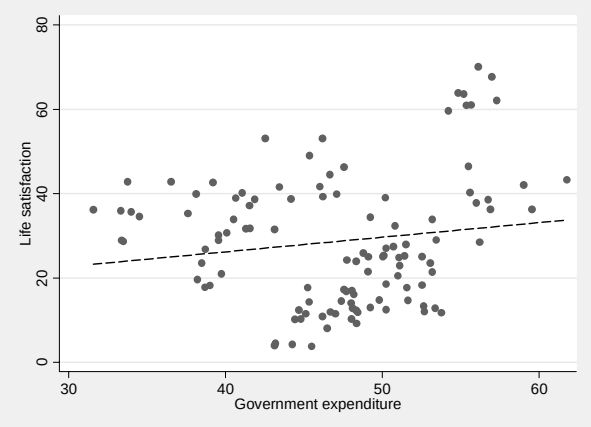

Fig. 1: Correlation of government expenditure and life satisfaction

There is a positive but weak relationship in figure 1 with quite a lot of dispersion around the regression line. This suggests that not only the level of total government expenditure has an impact on life satisfaction, but also its particular composition. Of course, the quality of publicly provided goods and services should also play an important role. Kotakorpi and Laamanen (2007) provide evidence for the importance of quality in the correlation between public health care provision and well-being. In the sample at hand there is no quality indicator for each of the separate fields of government involvement. Instead the government effectiveness measure by Kaufmann et al. (2004) is used to capture the generally perceived level of quality in public provision.

In order to test the six hypotheses stated in the previous section, a dataset combining data on life satisfaction with social, economic and institutional variables is used. The dataset has a panel structure and covers 15 European countries over the time period between 1997 and 2004. The main data sources are the Eurobarometer Survey Series[7], the Penn World Tables and the OECD National Accounts II data. Table 4 in the appendix provides a more detailed overview of the data and its sources. The respective expenditure categories are measured as a share of the GDP and are taken from the OECD databases. Taking these measures as shares of the GDP is arguably superior to measuring them as a share of government expenditure. A government may spend a large share of its resources on education and yet this amount may be minor in relation to the GDP. Table 1 provides further information on the definition of the expenditure categories. When taking a closer look at this table, it becomes evident that education, health and social protection expenditure are the most homogeneous categories.

Categories such as economic affairs or general public services cover very different types of expenditure and that makes it even more difficult to reflect a priori on the effect on well-being. At a later point in time, the main focus is shifted towards social protection, health and education expenditure, while the other categories

[7] The appendix provides information on the waves of the survey that were used in this paper (see table 7).

Tab. 1: OECD Government Expenditure Categories

CATEGORY	INCLUDED ITEMS
Education	Pre-primary, primary, secondary, post-secondary but non-tertiary, tertiary education, subsidiary services to education
Health	Medical products, appliances and equipment, outpatient services, hospital and public health services
Social protection	Sickness, disability, old age, survivors, family and children, unemployment, housing
Defense	Military defense, civil defense, foreign military aid
Public order and safety	Police services, fire-protection services, law courts and prisons
Economic affairs	Economic, commercial and labor affairs, agriculture, forestry, fishing and hunting, fuel and energy, mining, manufacturing and construction, transport, communication
General public services	Executive and legislative organs, financial, fiscal and external affairs, basic research, transfers of a general character between different levels of government, foreign economic aid, general services, public debt transactions
Environmental protection	Waste management, waste water management, pollution abatement, protection of biodiversity and landscape
Recreation, culture & religion	Recreational and sporting services, cultural services, broadcasting and publishing services, religious and other community services
Housing & community amenities	Housing development, community development, water supply, street lighting

Source: European Commission (2007)

are included in the estimations as aggregates. Defense and public order and safety expenditure are summarized as public security expenditure, general public services and economic affairs expenditure are aggregated as economic and administrative expenditure, and the remaining categories are denoted as other expenditure.

Figure 2 provides an overview with respect to the size and functional composition of public expenditure for 15 European countries. The time series plots on the left reveal that there is quite a lot of variation in the extent of government involvement across European countries. It also becomes evident that there are two extreme types of government in Europe: the Scandinavian welfare states and the rather modest Anglo-Saxon governments with an average of about 55 and 38 percent of GDP, respectively. Of course, the extent of government involvement is also to some degree subject to variation over time. For Finland, Sweden and Ireland this variation amounts to up to 10 percentage points in the time period considered here.

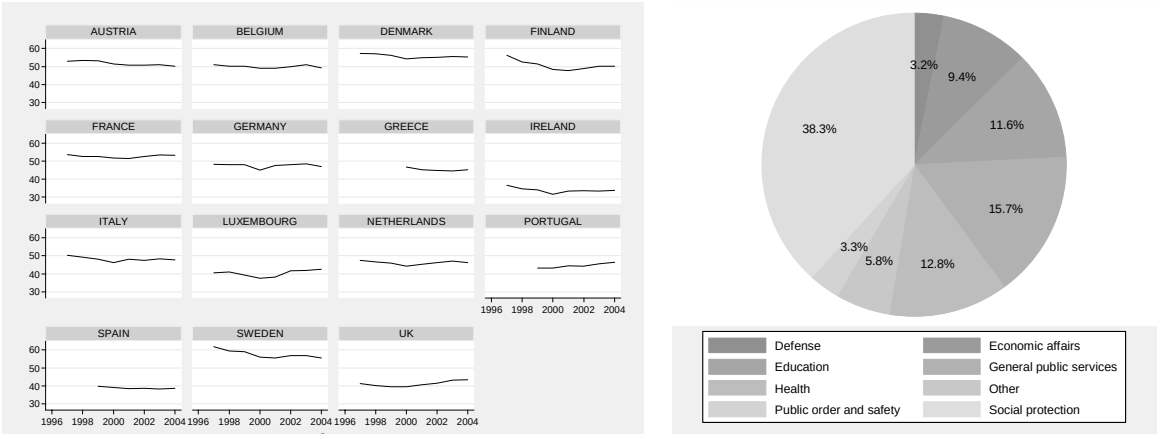

Fig. 2: Size and composition of government expenditure (OECD, 1997-2004)

The pie chart on the right of figure 2 disaggregates total public expenditure according to the areas in which it is spent and displays unweighted averages for the 15 countries across the relevant time period. Obviously, social protection expenditure represents the highest share of public spending with about 38 percent, followed by expenditure on general public services, health and education. Smaller categories with a share of less than 10 percent include economic affairs, public order and safety and defense. The residual category sums up expenditure on recreation, culture and religion, environmental protection and housing and community amenities which amount to 2.4, 2.0 and 1.4 percent, respectively.

A number of economic control variables are included in the regression analysis. Firstly, PPP-adjusted GDP per capita is taken from the Penn World Tables 6.2. Unemployment rates are taken from the OECD Economic Outlook report. Lucas et al. (2004) provide evidence for the large and persistent effect of unemployment on life satisfaction. Their panel analysis reveals that even people who find a job after being unemployed for a while do not return to their initial level of life satisfaction. The unemployment rate also captures negative effects on well-being through social problems such as crime (Edmark, 2005)[8] and social exclusion. Moreover, Blanchflower and Oswald (2004) find that unemployment has played a significant role with respect to life satisfaction over a long time period in the United States and Great Britain.

Economists tend to argue that globalization is beneficial due to a specialization in the production process and the possibility to consume more diverse goods (Krugman and Obstfeld, 2006). However, globalization can also reduce well-being through mechanisms such as lower job security for the unskilled (Moore and Ranjan, 2005). In sum, the sign of the impact of openness - measured as the sum of imports and exports divided by GDP - on life satisfaction is ambiguous. Another important economic variable is the investment price level relative to that of the US. This is simply an index which measures the level of prices for investment goods and is meant to serve as a proxy for a country's general business climate. A high value indicates strong domestic demand for investment goods. Hence, a positive sign for the respective slope coefficient is to be expected (Bjørnskov et al., 2007). Summarizing, it can be interpreted as an early indicator for the business cycle.

Furthermore, a number of non-economic control variables are included in the regression analysis. Social capital is believed to be an important determinant of well-being. This means that people who have strong ties with friends and family and well-functioning social networks have a higher probability of being satisfied with their lives than people who are lonely and who only depend on themselves. In this context, social trust appears to be an important factor which facilitates interaction among individuals (Helliwell, 2006). Therefore, social trust is believed to indirectly capture the extent of social networking. In the Eurobarometer survey people are asked about their trust in society's most important institutions[9]. The exact wording of the questions is the following:"Do you tend to trust or not to trust the following institutions?". By aggregating the answers of a total of 12 questions, a maximum score of 12 can be achieved.

The political and institutional environment related to the aggregation and efficient satisfaction of voters' preferences is also likely to have an impact on well-being. Data on government effectiveness is provided by Kaufmann et al. (2004) capturing the effectiveness in delivering public goods and services and the competence of bureaucracies, where a higher value indicates a higher degree of perceived effectiveness. It is measured on a scale that runs from -2.5 to +2.5 and is based on surveys in households, companies and government institutions. Since data for 1997, 1999 and 2001 is missing, the series has been interpolated for these three

[8] Using a panel of Swedish counties ranging from 1988 to 1999, she finds that unemployment has a significantly positive effect on property crimes such as burglary, car and bike theft.

[9] The institutions considered here are: the press, the radio, TV, the justice system, the police, the army, trade unions, political parties, big companies, the church or religious institutions in general, the national parliament and charity organizations. As information for 1998 is missing, this value has been interpolated.

points in time. Considering the trade-off between the interpolation and the otherwise unfortunate loss of up to 45 observations and the fact that the variable is generally quite stable over the years, this seems reasonable.

A strong participatory democracy serves as a control mechanism with regard to the behavior of politicians. In addition, political participation has been proven to create procedural utility (Frey and Stutzer, 2005)[10] that goes beyond the instrumental benefit of participation. Therefore, both the existence of democratic institutions and their extent of usage are expected to have an impact on well-being. A suitable measure provided by Moon et al. (2006) is the PEPS1 score variable which mulitiplies the Polity IV score for democracy with election turnout rates. Secondly, the political ideology of the three largest government parties is measured on a discrete scale, where -1 stands for leftwing, 0 for centrist and +1 for rightwing (Bjørnskov, 2005). One may hypothesize that a high level of expenditure is more likely to be tolerated in a society that expresses a preference for left-wing policy.

People in Europe seem to be quite concerned about economic inequality. People's well-being appears to decrease with inequality as there is a looming threat of becoming poor or as people feel uneasy in the presence of inequality (Alesina et al., 2004). Inequality is measured by means of data on Gini coefficients taken from the United Nations Development Program World Income Inequality Database (WIID). The UN codes these Gini coefficients according to their reliability and quality. The data used in this paper is based on the highest quality category and on calculations that involve the whole population and the disposable income of households. Finally, there are three health indicators from the World Health Organization (WHO) and the OECD that are used in testing the robustness of the regression results. This will be discussed in more detail in section 4.2.

Finally, the life satisfaction measure is based on the question "On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?" (the insignificant number of respondents answering "Don't know" and "No answer" are not considered in the analysis) measured on a scale that runs from 1 to 4 where a higher value indicates a higher level of satisfaction.

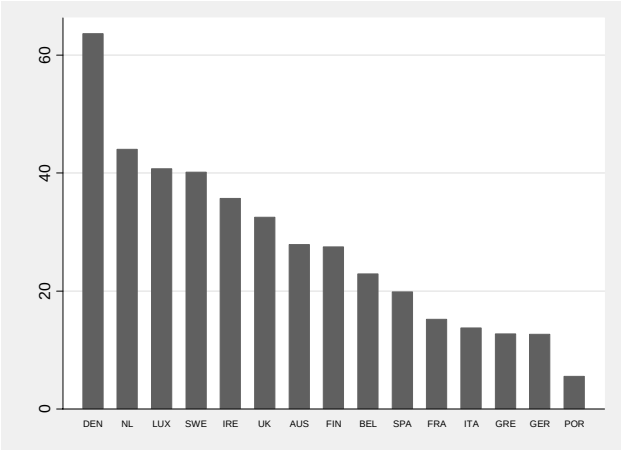

Fig. 3: Share of population 'very satisfied' with their lives (Eurobarometer, 1997-2004)

Figure 3 illustrates the share of "very satisfied" people averaged over the time period considered in each of the 15 countries. It clearly identifies Denmark as the country with the highest life satisfaction. There is obviously

[10] The authors find that people gain utility from participating in the political decision-making process, where this is measured by an index for direct democratic participation rights at the cantonal level in Switzerland.

quite a lot of cross-country variation with the mean ranging from about 60 percent to less than 10 percent in Portugal. The order in which the countries appear in the barchart is quite stable over time.

3.2 Empirical strategy

The empirical analysis is subdivided into two main parts: a set of baseline estimations with linear and non-linear specifications and robustness checks. When analyzing panel data there are four alternative estimation methods between which one has to make a choice: pooled OLS and the fixed effects, random effects or between estimator. The decision between these alternatives has to do with the assumptions concerning the characteristics of the error term and the relative magnitudes of the between and within variation. The following paragraphs discuss these issues and argue in favor of one of the four with regard to the investigation at hand.

Table 5 in the appendix reveals that the between variation for almost all variables is much higher than the within variation. If life satisfaction is only regressed on country dummies, the adjusted R^2 amounts to 94 percent[11]. This underlines the dominance of the cross-sectional dimension of this dataset. Secondly, the thought experiment that we are interested in is to compare two countries which are equal in all respects considered here except that one country has a higher level of expenditure or distributes its expenditure differently over the subcategories. Thus, we are wondering whether countries such as Denmark have a high level of life satisfaction compared to other countries due to the large size and the particular composition of government expenditure in Denmark. Starting from these premises a pooled OLS analysis certainly has the advantage of a higher number of observations in contrast to an ordinary cross-section investigation. However, there are reasons which speak against this estimation method and in favor of exploiting the panel structure of the dataset.

The choice thus remains between the three panel estimation techniques. Firstly, the between estimator, which has for instance been employed by Persson (2002) basically plugs in time averages of the dependent and independent variables in the regression equation and then weights each country by the number of years for which data are available. It is therefore very similar to OLS except for the fact that it takes into account the unbalanced nature of a panel. Employing the between estimator would mean that we are left with only 15 observations as the variation over time is not considered at all. As we are already losing quite a lot of information by averaging over the population within a country, averaging over time would cause an additional loss of valuable information. Therefore, the between estimator does not seem to be suited to this particular investigation.

Fixed effects estimations are usually considered to be the best alternative as they permit the elimination of time-constant unobservables through first differencing or time-demeaning. On the other hand, in this particular application they are bound to deliver insignificant coefficients as there is very little variation over time in the dependent and independent variables[12]. This lack of variation causes a high degree of imprecision in estimating the coefficients and high standard errors lead to low levels of significance. The best compromise is in the end to use a random effects estimator and to add region dummies in order to capture some of the unobserved heterogeneity that can for instance be due to cultural differences[13]. Here, we have to make the assumption that those time-constant unobservables that are not captured by the region dummies are uncorrelated with the independent variables. This random effects estimator is a GLS estimator that takes into account

[11] Regression output is not reported here, but can be obtained upon request.

[12] Results for the fixed effects estimations are not reported but can be obtained upon request.

[13] The Hausman test delivers inconclusive results for the baseline estimations and can therefore not be used to decide between fixed and random effects estimation.

the autocorrelation due to the time-constant unobservables in the error term. The baseline model including an intercept α, time fixed effects $Year_t$ and region fixed effects $Region_i$ looks as follows:

$$Lifesat_{it} = \alpha + \beta Expenditure_{it} + \gamma Z_{it} + \delta Region_i + \phi Year_t + \epsilon_{it} \quad (1)$$

$Expenditure_{it}$ represents either total government expenditure or a set of the different kinds of expenditure as a share of GDP, while Z_{it} is a vector of political and economic controls and ϵ_{it} represents the error term. The base category for the region dummies represented by $Region_i$ in equation (1) is central Europe (including Austria and Germany) and the other dummies are the Mediterranean region, Scandinavia, the Benelux region, the Iberian peninsula and Anglo-Saxon countries[14]. Additionally, all regressions include time dummies in order to control for exogenous shocks that are common to all countries considered. In the second set of regressions nonlinear relationships between government expenditure and life satisfaction are tested. The focus is on logarithmic and squared specifications.

The pairwise correlation coefficients in table 8 do not indicate any serious multicollinearity issues for the following regression analysis as they are all smaller than 0.8. There is a strong positive correlation between total government expenditure and some of the expenditure subcategories. These can be ignored since the total share and the individual categories will not appear simultaneously in any of the regressions.

4 Results

4.1 Estimations

The following analysis is subdivided into baseline regressions with linear and nonlinear specifications. The set-up of the first set of estimations in table 2 can be described as follows: Models 1 to 4 include total government expenditure as an explanatory variable, while models 5 to 7 include different combinations of the expenditure categories. In the first estimation life satisfaction is regressed on total government expenditure and a number of economic, social and political control variables without considering any nonlinearities. It appears that public spending has a positive impact on well-being that is significant at the 1 percent level. Furthermore, the control variables have the expected signs. The fact that the coefficient for the log of GDP per capita is significant in some models and insignificant in others is in line with somewhat contradictory evidence on the impact of income on well-being (Clark et al., 2008).

Government effectiveness appears to be the only institutional factor with a significant impact on well-being. In order to further investigate the importance of institutional factors, model 2 includes interactions between government size and the institutional factors. As soon as these interactions are included, the base effects become irrelevant. The interaction terms are significant either at the 5 or 10 percent level and suggest that the impact of government expenditure on well-being is more favorable if the government is perceived as effective, if democratic rights and their extent of usage are strong and if the ruling government has a left ideology. Models 3 and 4 additionally test the significance of the log and the square of government expenditure, but do not seem to be significant.

[14] If life satisfaction is only regressed on these region dummies, the adjusted R^2 amounts to 52 percent.

Tab. 2: Results for the baseline estimations, 1997-2004

Dep. var.: Life satisfaction	**Total government expenditure**				**Expenditure subcategories**		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Government expenditure	1.382***	-6.385**		-5.515*			
	(0.325)	(2.745)		(3.024)			
(Government expenditure)^2				-0.019			
				(0.025)			
Ln(Government expenditure)			-70.383				
			(64.734)				
Education expenditure					-1.390	-31.428***	-29.104***
					(2.977)	(5.840)	(5.911)
(Education expenditure)^2						2.694***	2.577***
						(0.387)	(0.383)
Social protection expenditure					-4.146	0.377	-2.620
					(3.136)	(3.971)	(3.091)
(Social protection exp.)^2						-0.090	
						(0.062)	
Health expenditure					-11.494***	-4.752*	-4.651*
					(3.015)	(2.684)	(2.772)
Economic & admin. expenditure					-5.756**	-0.220	0.068
					(2.632)	(2.448)	(2.516)
Public security expenditure					-9.802***	-7.198**	-4.965
					(3.709)	(3.518)	(3.299)
Other expenditure					-7.599**	-3.822	-4.853
					(3.358)	(3.695)	(3.552)
Ln GDP per capita	12.695	12.238	13.126	12.249	12.532	39.043***	47.052***
	(8.087)	(8.392)	(8.557)	(8.464)	(10.115)	(13.932)	(11.688)
Unemployment rate	-0.631	-1.067**	-1.039**	-1.014**	-0.661	-0.545	-0.412
	(0.461)	(0.464)	(0.447)	(0.475)	(0.493)	(0.397)	(0.398)
Gini coefficient	-1.379***	-1.188***	-1.112**	-1.262***	-1.228***	-0.797**	-0.827***
	(0.468)	(0.432)	(0.458)	(0.463)	(0.427)	(0.327)	(0.317)
Economic openness	0.040	-0.039	-0.006	-0.036	-0.034	-0.126***	-0.130***
	(0.029)	(0.033)	(0.033)	(0.033)	(0.040)	(0.043)	(0.043)
Investment price level	29.904***	10.520	13.484	12.984	19.805	4.950	5.196
	(8.193)	(9.650)	(9.566)	(9.757)	(12.551)	(12.265)	(12.500)
Social trust	4.664***	5.215***	5.359***	5.132***	4.084***	3.224***	3.575***
	(0.983)	(1.199)	(1.241)	(1.181)	(1.031)	(0.773)	(0.703)
Government effectiveness	18.190***	-47.554	-4.132	-61.709*	-61.279*	-21.389	-10.103
	(4.881)	(32.501)	(29.333)	(32.727)	(32.440)	(28.799)	(28.340)
Participatory democracy	2.028	-26.754*	-6.876	-30.042**	-18.561	-7.885	-7.595
	(1.733)	(14.549)	(9.030)	(14.661)	(13.585)	(12.790)	(13.045)
Government ideology	-1.090	26.147**	20.559*	28.965**	30.056***	25.383***	24.246***
	(0.850)	(10.479)	(11.087)	(11.909)	(10.368)	(9.122)	(9.090)
Gov't effectiveness * Gov't exp.		1.347*	0.462	1.633**	1.546**	0.770	0.555
		(0.706)	(0.647)	(0.695)	(0.717)	(0.632)	(0.621)
Partic. democracy * Gov't exp.		0.626**	0.216	0.685**	0.470*	0.194	0.194
		(0.306)	(0.193)	(0.305)	(0.278)	(0.259)	(0.263)
Gov't ideology * Gov't exp.		-0.547**	-0.440*	-0.604**	-0.629***	-0.544***	-0.520***
		(0.215)	(0.228)	(0.243)	(0.213)	(0.185)	(0.184)
$\frac{\partial Lifesat}{\partial Govtexp}$ at mean values	———-	0.699**	———-	———-	———-	———-	
		(0.334)					
Observations	111	111	111	111	111	111	111
R^2 adjusted	0.877	0.895	0.890	0.895	0.915	0.943	0.941
Chi^2	973.556	943.390	1028.534	934.750	1277.913	1654.781	1653.914
RMSE	5.977	5.627	5.755	5.639	5.204	4.337	4.362

Note: All regressions are estimated with robust standard errors, time and region fixed effects and the GLS random effects estimator.

Since the impact of government expenditure on well-being involves a number of interaction terms, one has to calculate the marginal impact at sample averages in order to be able to interpret the results. As model 2 is the preferred model, the calculation is only carried out in this case[15]. With average levels of government effectiveness, participatory democracy and government ideology, the impact of government expenditure on well-being is positive. Therefore, hypothesis 1a is confirmed under these circumstances. More specifically, a 1 percentage point increase in government expenditure would increase the share of the people who are very satisfied by almost 0.7 percentage points.

Models 5 to 7 provide additional interesting insights with respect to the relationship between specific expenditure subcategories and well-being. The focus is on public spending on education, social protection and health, while economic and administrative expenditure, public security expenditure and other expenditure are also controlled for. In model 5 linear relationships are tested. In this case only health expenditure has a significant effect on well-being, which appears to be negative. In model 6 quadratic terms for education and social protection expenditure are added. Only the quadratic term for education turns out to be significant, while the coefficient for health expenditure remains significantly negative. In the last model of table 2 only the quadratic term for education is kept as the other two were not significant. The RESET statistic provides additional support for the fact that model 7 is superior to model 5. For model 5, the null hypothesis of a correctly specified model with respect to nonlinearities is rejected at the 1 percent significance level. For model 7, however, the p-value is larger than 0.10 and therefore the null hypothesis cannot be rejected.

With respect to hypothesis 2 one can at this point state that it is confirmed with respect to social protection expenditure. This is in line with the findings of Veenhoven (2000). Regarding the significantly negative effect of health expenditure on well-being a word of caution is in order as a spurious correlation may be at work. If there are a lot of sick people in a society triggering high levels of health expenditures, it may well be that the coefficient captures the negative effect of being sick on well-being. Therefore, in section 4.2 the robustness of this result is tested by including several indicators for the average health status of the population. With respect to education expenditure it can be said that either relatively low or relatively high levels of expenditure on education have a positive marginal impact on well-being.

4.2 Robustness checks

In this section, two robustness checks are conducted, where the first one takes into account the level of health. In the previous section we have seen that health expenditure has a negative effect on life satisfaction. It may be that this is only the case because higher health expenditures is usually caused by a higher frequency and severity of diseases, which might have a negative correlation with life satisfaction. In the end, there will be a spurious relationship between health expenditure and life satisfaction. As a proxy for the level of health we use different measures: the share of people who are older than 65 years, hospital discharges related to diabetes per 100,000 people and the number of persons killed or injured in road traffic accidents per 100,000 people.

In each of the first three models in table 3 one of the health indicators is included in turn. Summarizing, the coefficients of all three health indicators have the expected negative sign even though they are insignificant.

[15] If the original model is represented by $y = \alpha + \beta_0 x + \beta_1 x z_1 + \beta_2 x z_2 + \beta_3 x z_3 + \epsilon$, the overall marginal effect on y is given by $\frac{\partial y(x)}{\partial x} = \beta_0 + \beta_1 z_1 + \beta_2 z_2 + \beta_3 z_3$. The average marginal effect is calculated by evaluating this marginal effect at sample averages of z_1, z_2 and z_3, i. e. $\frac{\partial y(\overline{x})}{\partial x} = \beta_0 + \beta_1 \overline{z_1} + \beta_2 \overline{z_2} + \beta_3 \overline{z_3}$. Finally, the variance of the estimated marginal effect is given by $Var(\frac{\partial y(\overline{x})}{\partial x}) = Var(\beta_0) + \sum_{i=1}^{3} 2\overline{z_i}^2 Var(\beta_i) + \sum_{i=1}^{3} 2\overline{z_i}^2 Cov(\beta_0, \beta_i) + \sum_{i=1}^{3} \sum_{j=1, j \neq i}^{3} 2\overline{z_i}^2 \overline{z_j}^2 Cov(\beta_i, \beta_j)$.

Tab. 3: Robustness checks, 1997-2004

Dep. var.: Life satisfaction	**Inclusion of health indicators**			**Country clusters to correct standard errors**	
	Model 1	Model 2	Model 3	Model 4	Model 5
Government expenditure				-6.385*	
				(3.802)	
Education expenditure	-30.470***	-26.766***	-26.371***		-29.104***
	(6.006)	(6.578)	(6.234)		(6.605)
(Education expenditure)^2	2.506***	2.412***	2.276***		2.577***
	(0.396)	(0.435)	(0.453)		(0.409)
Social protection exp.	-3.968	-3.351	-3.837		-2.620
	(3.306)	(2.840)	(3.429)		(4.438)
Health expenditure	-5.422*	-5.779**	-5.666*		-4.651
	(2.869)	(2.759)	(3.003)		(3.884)
Public security expenditure	-5.485*	-5.905*	-5.700		-4.965
	(3.177)	(3.468)	(3.590)		(3.800)
Economic & admin. exp.	-1.188	-0.259	-0.949		0.068
	(2.752)	(2.496)	(2.776)		(3.474)
Other expenditure	-6.253*	-4.152	-7.029		-4.853
	(3.782)	(3.239)	(4.545)		(4.324)
Ln GDP per capita	54.080***	46.387***	49.868***	12.238	47.052***
	(14.089)	(11.669)	(13.402)	(10.714)	(12.724)
Unemployment rate	-0.576	-0.181	-0.611	-1.067	-0.412
	(0.418)	(0.453)	(0.434)	(0.679)	(0.531)
Gini coefficient	-0.631*	-0.423	-0.828***	-1.188***	-0.827**
	(0.367)	(0.388)	(0.310)	(0.461)	(0.410)
Economic openness	-0.155***	-0.132***	-0.139***	-0.039	-0.130**
	(0.049)	(0.046)	(0.048)	(0.041)	(0.056)
Investment price level	-6.531	-3.192	0.186	10.520	5.196
	(14.832)	(11.179)	(13.628)	(14.483)	(13.422)
Social trust	2.893***	3.300***	3.140***	5.215**	3.575***
	(0.861)	(0.953)	(0.888)	(2.137)	(1.057)
Government effectiveness	-18.845	-36.259	-14.522	-47.554	-10.103
	(29.011)	(26.734)	(29.846)	(35.335)	(34.305)
Participatory democracy	-12.623	-2.456	-12.260	-26.754	-7.595
	(13.970)	(11.878)	(14.338)	(18.552)	(17.379)
Government ideology	26.747***	21.453***	24.414***	26.147*	24.246**
	(9.105)	(8.089)	(9.282)	(14.233)	(11.078)
Gov't effectiveness * Gov't exp.	0.725	1.170*	0.659	1.347*	0.555
	(0.629)	(0.611)	(0.657)	(0.789)	(0.805)
Partic. democracy * Gov't exp.	0.322	0.084	0.308	0.626	0.194
	(0.289)	(0.248)	(0.300)	(0.401)	(0.337)
Gov't ideology * Gov't exp.	-0.568***	-0.467***	-0.518***	-0.547*	-0.520**
	(0.185)	(0.167)	(0.189)	(0.291)	(0.225)
Share of population > 65 years	-1.337				
	(1.114)				
Diabetes: Hospital discharges		-0.000			
		(0.012)			
Accident victims			-0.011		
			(0.013)		
$\frac{\partial Lifesat}{\partial Govtexp}$ at mean values	———	———	———	0.699**	———
				(0.316)	
Observations	111	103	108	111	111
R^2 adjusted	0.942	0.941	0.941	0.895	0.941
Chi^2	1717.818	1746.168	1712.009	254.109	3023.563
RMSE	4.351	4.078	4.396	5.627	4.362

Note: All regressions are estimated with robust standard errors, time and region fixed effects and the random effects GLS estimator.

Furthermore, the coefficient of health expenditure remains negative and significant across all three models. Assuming that these three indicators are valid proxies for the health status of the population, one can state that the public provision of health care indeed reduces the subjective well-being of the population. This is an important finding that is contrary to what has been found by Kotakorpi and Laamanen (2007), who find a positive effect of health expenditure on well-being in Finland.

The second robustness checks involves country clusters in order to correct the standard errors. Throughout the paper a GLS estimator has been used, which corrects the standard errors for autocorrelation due to unobserved heterogeneity. Clustering provides an additional correction of the standard errors and is regarded as a strong robustness check. In this case the standard errors are clustered at the country level. The negative coefficient of health expenditure is not significant at the 10 percent level anymore. However, for total public spending and education expenditure the results stated previously appear to be very robust. Furthermore, the coefficients for the interaction terms regarding participatory democracy and government effectiveness are mostly insignificant in table 3.

5 Conclusion

The preceding sections have analyzed the impact of the size and composition of government expenditure on life satisfaction and have brought to light several interesting insights. The first finding is that the effect of public sector size on life satisfaction depends crucially on the ideology of the three strongest political parties. This is in line with findings by Bjørnskov et al. (2007). The extent of government effectiveness and participatory democracy also seem to play a role, even though these effects are not as robust. With average levels for these institutional factors, public spending appears to have a positive impact on well-being providing evidence for the welfare economic view. The second major insight is that social protection expenditure has no impact on well-being, while there is a U-shaped relationship between spending on education and well-being. This may be interpreted as evidence for multi-peaked preferences. Furthermore, health expenditure has a negative effect on well-being even when controlling for health status.

At this point one should not forget to reflect on the limitations of this analysis. Firstly, the quality dimension of government expenditure has only been partially taken into account in the regression analysis. Certainly, more detailed measures for the quality of publicly provided goods and services would be desirable. Secondly, it may be interesting to disaggregate expenditure categories on the federal, state and communal level. For example, one may argue that communal expenditure can be better targeted as the heterogeneity of preferences can more easily be considered (Oates, 1972). Thirdly, each of the ten expenditure categories as described in table 1 includes quite heterogeneous types of expenditure. For instance, general public services includes expenditure on diverse purposes such as foreign economic aid, public debt transactions and executive and legislative organs. Due to this diversity it is difficult to predict a priori the impact on well-being. Therefore, a more detailed disaggregation would be advantageous.

To conclude, there is a large and economically interesting impact of the size and composition of government expenditure on life satisfaction. Hence, the interrelation between public finances and the well-being of society deserves further attention in the future. Elements of direct democracy and other safeguards to restrain the selfish behavior of politicians and bureaucrats are necessary in order to further strengthen the positive impact of the public sector on life satisfaction. Finally, one should acknowledge that the benefit principle of taxation is indeed fulfilled and that governments in Europe generally contribute to the well-being of society.

A Appendix: Descriptive Statistics

Tab. 4: Definition and Source of Variables

VARIABLE	DESCRIPTION	SOURCE
Dependent Variable		
Life satisfaction	Share of the population that claims to be 'very satisfied' with their lives	Eurobarometer
Government Expenditure Variables (as shares of GDP)		
Government expenditure	Total public expenditure	OECD National Accounts II
Education expenditure	Public expenditure on education	OECD National Accounts II
Health expenditure	Public expenditure on health	OECD National Accounts II
Social protection expenditure	Public expenditure on social protection	OECD National Accounts II
Public security expenditure	Public expenditure on defense, public order and safety	Own calculations based on OECD National Accounts II
Economic & administrative expenditure	Public expenditure on economic affairs and general public services	Own calculations based on OECD National Accounts II
Other expenditure	Public expenditure on remaining items	Own calculations based on OECD National Accounts II
Economic Controls		
GDP per capita	PPP-adjusted GDP per capita	Penn World Tables 6.2
Unemployment rate	———	OECD Economic Outlook No. 82
Gini coefficient	Measure of inequality based on the disposable income of households	UN Development Program WIID
Economic openness	Exports plus imports divided by GDP	Penn World Tables 6.2
Investment price level	Investment price level relative to the US	Penn World Tables 6.2
Non-Economic Controls		
Social trust	Trust in society's institutions	Eurobarometer
Government effectiveness	Public perception of the effectiveness in delivering public goods and services and the competence of bureaucracies	Kaufmann et al. (2004)
Government ideology	Political ideology of the three largest parties	Bjørnskov (2005)
Participatory democracy	Extent of participatory democracy	Moon et al. (2006)
Health Indicators		
Share of population $>$ 65 years	Share of population older than 65 years	OECD Regional Database
Accident victims	Number of persons killed or injured in road traffic accidents	WHO Health For All Database
Diabetes: Hospital discharges	Number of formal releases of diabetic in-patients from an acute care institution after a period of hospitalization	OECD Health Data

Tab. 5: Summary statistics, 1997-2004

Variable	Variation	Observations	Mean	St. dev.	Minimum	Maximum
Life satisfaction	Overall	120	27.65	15.48	3.76	70.06
	Between	15		15.45	5.55	63.62
	Within	8		3.84	19.53	40.01
Government expenditure	Overall	113	47.18	6.56	31.56	61.77
	Between	15		6.53	33.82	57.62
	Within	7.53		1.36	44.26	55.72
Education expenditure	Overall	113	5.52	1.27	2.75	8.24
	Between	15		1.34	2.98	7.99
	Within	7.53		0.21	4.88	6.13
Health expenditure	Overall	113	6.01	1.01	2.94	7.74
	Between	15		0.98	3.98	7.22
	Within	7.53		0.38	4.75	7.09
Social protection exp.	Overall	113	18.23	4.06	7.84	24.39
	Between	15		4.12	9.04	23.55
	Within	7.53		0.61	16.64	20.84
Public security exp.	Overall	113	3.03	0.87	1.12	5.22
	Between	15		0.90	1.26	4.83
	Within	7.53		0.15	2.39	3.48
Economic & admin. exp.	Overall	113	11.74	2.39	7.00	16.33
	Between	15		2.31	7.36	15.16
	Within	7.53		0.82	9.70	14.00
Other expenditure	Overall	113	2.66	0.67	1.25	4.04
	Between	15		0.66	1.28	3.80
	Within	7.53		0.26	2.07	3.88
Ln GDP per capita	Overall	120	10.10	0.26	9.41	10.90
	Between	15		0.25	9.59	10.74
	Within	8		0.10	9.83	10.32
Unemployment rate	Overall	120	7.14	2.92	2.52	16.31
	Between	15		2.76	3.20	12.09
	Within	8		1.18	5.19	12.32
Gini coefficient	Overall	118	28.63	4.26	20.00	38.00
	Between	15		4.14	22.19	37.09
	Within	7.87		1.37	26.03	32.23
Openness	Overall	120	98.97	59.43	47.82	286.48
	Between	15		60.73	53.56	268.78
	Within	8		7.74	64.27	116.68
Investment price level	Overall	120	1.06	0.17	0.72	1.75
	Between	15		0.13	0.83	1.38
	Within	8		0.11	0.87	1.43
Social trust	Overall	120	6.94	0.95	3.50	9.10
	Between	15		0.89	5.15	8.81
	Within	8		0.40	5.29	7.78
Government effectiveness	Overall	120	1.71	0.43	0.68	2.26
	Between	15		0.43	0.82	2.11
	Within	8		0.09	1.38	1.93
Government ideology	Overall	120	-0.15	0.90	-1	1
	Between	15		0.65	-1	1
	Within	8		0.64	-1.40	1.60
Participatory democracy	Overall	120	7.49	0.88	5.69	8.90
	Between	15		0.86	5.81	8.67
	Within	8		0.27	6.90	8.08

Tab. 6: Included countries and mean values of main variables

Country	Government expenditure	Education expenditure	Health expenditure	Social protection expenditure	Public security expenditure	Economic & admin. exp.	Other expenditure
Austria	51.74	5.91	7.22	21.14	2.37	12.84	2.27
Belgium	49.96	5.90	6.46	17.49	2.83	15.16	2.12
Denmark	55.71	7.99	6.87	22.77	2.63	12.57	2.90
Finland	50.67	6.06	6.09	21.49	2.99	12.04	1.99
France	52.67	6.39	6.83	21.69	3.37	10.79	3.61
Germany	47.58	4.28	6.24	21.83	2.86	10.06	2.32
Greece	45.35	2.98	4.19	17.60	4.78	14.52	1.28
Ireland	33.82	4.26	6.29	9.04	2.19	9.46	2.59
Italy	48.16	4.73	6.07	17.78	3.17	13.97	2.45
Luxembourg	40.32	4.72	4.72	16.90	1.26	8.93	3.80
Netherlands	46.16	4.92	3.98	17.34	3.14	13.54	3.23
Portugal	44.49	7.14	6.64	13.45	3.30	11.34	2.62
Spain	38.81	4.37	5.24	13.00	2.94	9.95	3.31
Sweden	57.62	7.13	6.53	23.55	3.57	14.06	2.78
UK	41.14	5.12	5.99	15.58	4.83	7.36	2.27
Total	47.18	5.52	6.01	18.23	3.03	11.74	2.66

Country	Ln GDP per capita	Unemployment rate	Gini coefficient	Economic openness	Inv. price level	Social trust	Government effectiveness	Gov't ideology	Participatory democracy
Austria	10.21	5.31	24.78	90.72	1.07	7.15	1.88	0.25	7.46
Belgium	10.12	8.08	28.46	163.16	1.03	5.15	1.81	1.00	8.46
Denmark	10.23	4.88	22.19	85.78	1.18	8.81	2.07	-0.25	8.32
Finland	10.03	10.05	24.30	72.83	1.11	8.14	2.07	-0.75	7.85
France	10.13	8.80	28.35	54.12	0.95	5.89	1.53	0.25	6.49
Germany	10.14	7.93	25.98	65.83	1.06	6.12	1.76	-0.50	7.39
Greece	9.59	11.09	33.99	53.75	0.93	7.37	0.82	-1.00	8.67
Ireland	10.13	5.71	30.84	171.41	1.38	7.15	1.72	0.13	6.69
Italy	10.04	9.87	31.37	53.56	0.96	6.49	0.87	0.38	8.61
Luxembourg	10.74	3.20	26.53	268.78	1.07	7.39	2.10	0.00	5.81
Netherlands	10.17	3.82	25.89	131.78	1.16	7.22	2.11	-0.50	7.36
Portugal	9.76	5.27	37.09	73.36	0.83	7.24	1.20	-0.50	7.41
Spain	9.90	12.09	32.11	59.64	0.95	6.51	1.69	1.00	7.68
Sweden	10.13	5.40	25.60	82.77	1.11	6.74	2.05	-1.00	7.85
UK	10.13	5.59	32.04	57.10	1.05	6.75	1.97	-0.75	6.35
Total	10.10	7.14	28.63	98.97	1.06	6.94	1.71	-0.15	7.49

Tab. 7: Description of the Eurobarometer Survey Series Data

Wave	Year	Number of respondents															
		Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	Netherlands	Portugal	Spain	Sweden	UK	Total
47.1	1997	1,030	995	1,001	1,009	998	2,035	1,009	997	990	594	1,018	994	997	997	1,371	16,035
48.0	1997	972	1,008	964	992	983	1,930	998	978	946	596	968	894	958	928	1,292	15,407
49	1998	1,004	998	997	1,041	1,020	1,993	1,009	984	994	600	1,031	994	1,000	1,017	1,350	16,032
51.0	1999	943	1021	958	1,039	959	1,912	988	945	924	568	971	912	961	931	1,282	15,314
52.0	1999	984	1,035	997	1,014	990	2,014	1,003	974	1,004	595	1,008	993	988	994	1,297	15,890
52.1	1999	1,042	996	1,000	987	1,002	2,042	1,003	995	1,000	616	1,000	1,000	999	999	1,357	16,038
53	2000	974	1,060	997	1,006	992	2,018	1,002	991	994	596	975	993	995	997	1,364	15,954
54.1	2000	971	1,037	979	1,011	994	2,006	1,001	979	986	598	998	991	1,000	998	1,361	15,910
55.1	2001	1,009	1,032	1,001	1,009	996	2,074	1,004	960	984	603	1,037	997	990	999	1,335	16,030
56.1	2001	998	1,027	1,000	992	991	1,995	1,004	991	988	598	1,005	999	999	997	1,301	15,885
56.2	2001	981	1,000	996	998	988	1,986	997	970	996	599	996	997	990	997	1,309	15,800
57.1	2002	982	1,025	997	1,006	997	2,035	1,000	975	994	600	997	996	992	996	1,304	15,896
57.2	2002	1,017	1,042	1,001	1,004	995	2,033	1,002	985	1,001	597	1,013	997	998	995	1,352	16,032
58.1	2002	981	1,028	996	1,006	989	2,010	1,001	983	1,041	598	998	990	991	993	1,304	15,909
59.1	2003	971	1,078	950	978	1,039	1,948	989	973	939	587	957	972	975	966	1,229	15,551
60.1	2003	981	1,001	994	1,017	999	1,997	999	984	1,006	577	1,005	983	995	995	1,355	15,888
61.0	2004	996	965	975	1,016	974	1,942	982	931	945	585	987	950	951	978	1,219	15,396
62.0	2004	990	970	1,027	1,005	1,014	1,543	1,000	988	1,017	501	1,008	991	1,020	1,000	1,306	15,380
62.2	2004	1,023	1,005	1,008	1,028	998	1,529	996	998	993	509	1,016	989	1,021	1,009	1,354	15,476
	Total	18,849	19,323	18,838	19,158	18,918	37,042	18,987	18,581	18,742	11,117	18,988	18,632	18,820	18,786	25,042	299,823

Tab. 8: Cross-correlation matrix

Variables	Government expenditure	Education expenditure	Health expenditure	Soc. protection expenditure	Economic & admin. exp.	Publ. security expenditure	Other expenditure	Ln GDP per capita	Unemploy-ment rate	Gini coefficient	Economic openness	Inv. price level	Social trust	Government effectiveness	Gov't ideology	Participatory democracy
Government expenditure	1															
Education expenditure	0.69	1														
Health expenditure	0.42	0.60	1													
Soc. protection expenditure	0.90	0.49	0.29	1												
Economic & admin. exp.	0.62	0.23	-0.04	0.38	1											
Publ. security expenditure	0.16	-0.04	-0.06	0.08	0.09	1										
Other expenditure	-0.05	0.18	-0.12	-0.03	-0.25	-0.41	1									
Ln GDP per capita	-0.08	0.08	0.01	0.12	-0.37	-0.63	0.51	1								
Unemploy-ment rate	0.11	-0.26	-0.01	0.09	0.26	0.34	-0.34	-0.62	1							
Gini coefficient	-0.53	-0.33	-0.13	-0.66	-0.20	0.39	-0.18	-0.53	0.28	1						
Economic openness	-0.39	-0.16	-0.30	-0.33	-0.15	-0.70	0.36	0.69	-0.53	-0.19	1					
Inv. price level	-0.08	0.01	0.11	-0.06	-0.09	-0.28	0.06	0.33	-0.24	-0.39	0.32	1				
Social trust	0.03	0.23	-0.11	0.08	-0.08	-0.17	0.01	0.02	-0.26	-0.24	0.03	0.10	1			
Government effectiveness	0.12	0.32	-0.00	0.24	-0.22	-0.32	0.30	0.60	-0.49	-0.68	0.40	0.40	0.21	1		
Gov't ideology	-0.13	-0.04	0.14	-0.20	-0.01	-0.30	0.15	0.19	0.17	0.07	0.19	0.02	-0.31	0.01	1	
Participatory democracy	0.47	0.11	0.08	0.29	0.76	0.24	-0.49	-0.55	0.48	-0.01	-0.42	-0.11	0.05	-0.38	0.01	1

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