Do Large Governments Decrease Happiness?

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Abstract

Until now there was little evidence of the influence of large governments on happiness and when it existed, it was positive. We show that structural government consumption and other measures of long-term government imbalances significantly decrease happiness and life satisfaction in European countries. In some cases there is evidence of an inverted U-shaped relationship between the Government burden and happiness, for which the negative relationship begin just before the median. This evidence may lead European politicians to reject the idea that bigger Governments lead to higher people satisfaction and to win elections. This result is consistent with people valuing (negatively) expectations for future tax increases, macroeconomic imbalances, and austerity.

Keywords: Happiness, Life Satisfaction, Government Size, Fiscal Deficits, Public Debt, Europe

JEL Codes: C21, D60, H30, I31, O52

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1. Introduction

In this article, we present, for the first time, estimations of the effects of structural government consumption and related government variables in happiness and life satisfaction. To this end, we use the European Quality of Life Surveys, waves 2003 and 2007, to collect individual microdata for socio-economic indicators, and also for life satisfaction, and happiness. We complete the dataset with measures of structural government consumption (in % of GDP), structural government balances (in % of GDP), and public debt (in % of GDP). We aim to provide evidence on whether large governments decrease happiness (or not). This should enlighten politicians in what concerns their usual desire to increase government intervention in order to appraise electors. In fact, as we may conclude below, previous contributions have highlighted positive effects of deficits, government expenditures or at least of some types of expenditures (such as welfare state variables) on variables linked with wellbeing, such as happiness and life satisfaction. The corollary of these results would be then that there is a justification to larger governments, since it increases citizen's happiness (although the literature pointed out no justification concerning the negative relationship between government size and growth). We re-address this issue and we show that larger governments decrease happiness. These results re-launch the debate about the relationship between the size of the government and happiness and seem to cast doubts on the reasoning according to which larger governments and a generous welfare state may be justifiable through its relationship with happiness.

As shown in MacKerron (2012), since the late nineties of the XXth century the number of articles dealing with happiness has grown exponentially. However, most have concentrated on the relationship between income and happiness, finding that while richer countries tend to have, on average, higher levels of happiness, continuous increases in income cannot be associated with happier populations. This phenomenon has been named the Easterly Paradox (for recent attempts to solve the Easterly paradox see e.g. Clark *et al.*, 2007; Bartolini and Bilancini, 2010; Choudhary *et al.*, 2011).

The effect of other macroeconomic variables on happiness has also been subject to some research. As MacKerron (2012) puts it, high unemployment rates may reduce wellbeing, although research is limited, (but high local unemployment rates may also ameliorate the impact of an individual's own unemployment); inflation may also have a negative influence on wellbeing, especially for those who favor right wing politics. Evidence on income inequality is mixed; its effect may depend partially on real or perceived mobility. Some articles have analyzed the impact of crises in happiness. While Greve (2012) did not find any association between the economic crises of 2010 in European countries and happiness, Deaton (2011) found a strong correlation between individual well-being and the stock market indexes in the USA.

The connection between the role of the Government and happiness has been, in some degree, a neglected subject in the literature. There are some studies that address the effects of social insurance and the welfare state (MacKerron, 2012). Di Tella and MacCulloch (2008) identified positive effects of the welfare state on happiness for OECD countries. Some evidence of the effect of social security measures is also provided by Uhde (2010) in which the fall in social security expenditures may explain the decrease in life

satisfaction in Germany since 2001, despite of having increased material prosperity. The effects of governments in happiness have also been analyzed using political variables such as democracy, with a positive effect (MacKerron, 2012) and also bureaucratic accountability and transparency, which has contributed to reduce the disparities in well-being in US states (Luechinger *et al.*, 2013).

The effects of government expenditures, deficits, and austerity measures in happiness and well-being were only sparsely analyzed until now, as recognized by Kim and Kim (2012). For instance, Di Tella and MacCulloch (2008) presented a statistically significant and positive effect of unemployment benefits in happiness, a specific item of government expenditure. In fact, in the working paper version of that article the authors presented regressions (Table 1A) in which government expenditure has a significantly positive effect in happiness. In a master thesis, Jimenez (2011) evaluated the effects of government size in happiness but she has done that in regressions in which all data are aggregate, which is a clearly inferior option when compared to studies that use microdata for individual features. Yamamura (2011) – for Japan, Kiyia (2012) – for the USA, and Akay *et al.* (2012) – for Germany -, presented evidence of a positive or at least non-significant effect of government size on happiness, using expenditures' size and composition in the first two and taxes on the third, respectively, as measures of government size. Hessami (2010) access the effect of size and composition of government expenditures on life satisfaction. The author found a positive effect of government size on life satisfaction. This positive effect seems to decrease with the size of the government (the so-called inverted U-shaped relationship), with relative income, ideological preferences, and corruption and seems to increase with expenditures decentralization. Whether these last effects seem to be quantitatively meaningful, the negative effect of government size (the right-side of the inverted U) does not have practical significance as globally it would occur only after the government expenditure (as % of GDP) exceeds 115%,[2] value that is out of the observed values by the author (see e.g. their Figure 2). None of these articles analyzed the effect of the government size independently of the effect of expansions or recessions. We fill this gap, concentrating on structural (or long-run) measures. In fact, it is possible that agents value positively the countercyclical measures governments take to overcome or alleviate recessions. Thus the positive effects obtained so far in the literature may overestimate the role of government expenditures in smoothing recessions. The fact that most of the positive effects were obtained from regressions using welfare state expenditures as independent variables, namely unemployment protection, may be suggestive of this idea.

Following the argument stressed by Deaton (2011) then applied to the effects of financial markets, we also consider that the conditional effects of the government size in the economy as well as government imbalances may reflect, not only the desire for a stable macroeconomic environment and balanced government accounts, but also the fear from future increases in taxes or future austerity, i.e., following the principles of Ricardian Equivalence. Following this argument, we estimate the effects of several structural (or long-run) measures of government size on happiness or life satisfaction (which in this paper are the measures for individual wellbeing).

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[2] This value results from coefficients in Table 1. Results in Table 2 yield a threshold of 60.25%, in Table 3, 103.5% and in Table 5, 63.5%. All these values are at the upper bound (or above the upper limit) of the interval in Figure 2.

Our contribution to the literature is threefold. First, we enlarge the study of the influence of government expenditure in happiness to almost 30 countries while previous analysis restricts to individual countries or at most to 12 European countries. Second, contrary to analyzing the effect of different components of the government expenditures on happiness, as previous contributions did, we concentrate on the influence of structural or long-run measures of the government weight in the economy. Finally, we found an unexpected negative effect of government weight on happiness, which remains valid through several robustness checks.

This work has the following structure: In Section 2 we describe the data and methods used and in section 3 we describe the empirical results. Section 4 concludes.

2. Data and Methods

We collected data from the European Quality of Life Surveys (EQLS) - waves 2003 and 2007 - concerning individual characteristics such as age, gender, marital status, education, number of children, type of habitation, income, main economic status (professions), number of hours worked, health, life satisfaction, and happiness. Life satisfaction and happiness are used as substitute (dependent) variables in regressions. Life satisfaction is measured on a scale of 1 to 10, of the answer to the following question 'All things considered, how satisfied you say you are with your life?', while happiness is measured on a scale of 1 to 10, of the answer to the question 'Taking all things together, how happy would you say you are?'[3] We run separate regressions for the waves 2003 and 2007.[4] EQLS is carried out every four years and examines both the objective circumstances of European citizens' lives and how they feel about those circumstances and their lives in general. It is the successor of the Eurobarometer Survey Series used by some of the previous literature to access the relationship between Government and Happiness (as e.g. Hessami, 2010).

Concerning the effect of government size on happiness and life satisfaction we choose two forms of structural government expenditures: (1) the ratio of government consumption to the trend of GDP - $G/\bar{Y}$ and (2) the ratio of trend government consumption to the trend of GDP - $\bar{G}/\bar{Y}$. We use the Hodrick-Prescott filter to calculate the trend variables of each variable for each country. These variables were taken from the Penn World Tables 7.0, considering the time span between 1980 and 2010 to calculate the trend of both series. International organizations tend to use trend GDP in their calculations of structural government balances. However they tend to calculated the structural component of government consumption by subtracting cyclical consumption mainly associated with unemployment protection (see e.g. Bodmer and Geier, 2004). Due to the fact that some other government consumption may be also cyclical (e.g. poverty relief expenditures) and the difficulty on estimating the natural unemployment rate

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[3] A detailed description of all variables used in this work can be found in Appendix, Table 1.A.

[4] A possible alternative approach would be to pool both datasets in just one. This alternative procedure would find problems such as different coverage between waves – different waves cover different samples and different measurement across different waves – variables such as age and education are measured differently in 2003 and 2007. There were certainly methods to pool both datasets, but we are sure that more concise results would be obtained at the expense of an increase in measurement error issues.

for each country, we use the trend variable to evaluate the long-run component. However, just to compare with the total government size as a share of GDP, we also calculate $G/\bar{Y}$. In order to evaluate the robustness of our results, we also use other structural measures of government, such as structural balance and public debt, calculated by the Eurostat, in a following section of the paper. We have averaged structural government consumption from 1998 to 2003 and from 2002 to 2007 and associated it with happiness in 2003 and 2007, respectively. With this option we are focusing on the effect of government consumption on happiness, not including government capital expenditures, as the majority of previous contributions did. This allows us to disentangle positive effects of government investments in growth or externalities that could be valued positively by agents. Moreover, like some previous references have uncovered positive effects of the welfare state on happiness, current government expenditure (or government consumption) is a good variable to represent the role of the state as a provider of social welfare. Additionally, government consumption is also the variable linked with government policy that has been most related to economic growth in the literature, with a negative influence (e.g. Hauk and Wackziarg, 2009). If government consumption is positively related to happiness or life satisfaction, as previous works seem to suggest, there would be a trade-off between growth and welfare implied by government consumption, and this could justify expansionary government consumption by politicians, despite a negative effect on growth. However, if the result is the opposite, there would be no reasonable argument that supports policies that systematically increase government consumption on the long-run.

Additionally, in order to access the influence of a number of variables calculated by international organizations, namely those calculated by the Eurostat and used for the excessive deficit procedure by the European Commission, we also include public debt (general government consolidated gross debt) and the structural balances of general government, both in percentage of potential (trend) GDP.

We estimate equation (1) presented below through the Ordered Probit and the OLS methods. This equation is our benchmark regression both on life satisfaction and happiness (we name these dependent variables WB, standing for wellbeing).

$$WB_{i,t} = \alpha_0 + \beta_1 Inc_{j,i,t} + \beta_2 Hea_{j,i,t} + \beta_3 Edu_{j,i,t} + \beta_4 Age_{j,i,t} + \beta_4 Age_{j,i,t}^2 + \beta_5 Unemp\_sr\_d_{j,i,t} +$$
$$\beta_6 Unemp\_lr\_d_{j,i,t} + \beta_7 Hwk_{j,i,t} + \beta_8 Chil_{j,i,t} + \beta_9 Gen_{j,i,t} + \sum_{dp=10}^{17} \beta_{dp} Prof\_d_{j,i,t} +$$
$$\sum_{dh=18}^{23} \beta_{dh} Hou\_d_{j,i,t} + \sum_{dm=24}^{27} \beta_{dm} Mar\_d_{j,i,t} + \beta_{28} Stgov_{i,t} \tag{1}$$

Where $Inc_{j,it}$ is the household´s total net monthly income[5], $Hea_{j,i,t}$ is the individual health conditions ranging between 1 (very good) and 5 (very bad), $Edu_{j,i,t}$ is the education level (measured in ISCED levels

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[5] Some previous papers, as MacKerron (2012) noted, discovered that relative income is more important than absolute income in the explanation of wellbeing. However, some others as Angeles (2009) and Pouwels *et al.* (2008) prefer to use individual income to explain wellbeing. In particular, the last paper discovered that individual income gains importance if one takes into account the hours worked, as we also do. However, we tested the inclusion of relative income (individual income/average income, with the denominator been obtained through averaging all observations within each country. Although this variable becomes highly significant (more than absolute individual income, as is also pointed out in previous literature), this does not change any of our results and in particular it does not change the significance of other variables. These alternative results are available upon request.

in 2007 and in major education levels in 2003), $Age_{j,i,t}$ is the age category, which also appears squared in regressions, $Unemp\_sr\_d_{j,i,t}$ is a dummy that sets 1 if the individual is unemployed in less than 12 months, $Unemp\_lr\_d_{j,i,t}$ is a dummy that sets 1 if the individual is unemployed for more than 12 months, $Hwk_{j,i,t}$ is the number of weekly hours worked, $Chil_{j,i,t}$ is the number of children, $Gen_{j,i,t}$ is gender, assuming 1 for male and 2 for female, $Prof\_d_{j,i,t}$ are a set of professional categories dummies, $Hou\_d_{j,i,t}$ are a set of dummies for house features linked with the nature of the property, $Mar\_d_{j,i,t}$ is a set of dummies for marriage status (for married, divorced, widowed, and never married), and finally $Stgov_{i,t}$ is one of the two structural government consumption measures discussed above (Stgov - $G/\bar{Y}$ and Stgov1 - $\bar{G}/\bar{Y}$). The suffix _d in variables names means a dummy variable, i is the country indicator (EQLS 2003 includes 28 European countries and EQLS 2007 includes 31 European countries) and t = 2003, 2007. Dependent variables are alternatively Life Satisfaction and Happiness. The dummies were included in the regressions but are omitted in the tables to allow for better readability and because their analysis is not the core of our analysis. This means that in our model there are individual effects and macro-effects as in Di Tella and MacCulloch (2008) and Hessami (2010). In our case, however, macro-effects are measured by government variables.

The descriptive statistics for the main variables are presented in Table 1.

Table 1: Descriptive Statistics for the Main Variables

	Data for 2007					Data for 2003				
Variable	**N**	**Average**	**Std. Dev.**	**Min**	**Max**	**N**	**Average**	**Std. Dev.**	**Min**	**Max**
Happiness	35380	7.336405	1.924874	1	10	25654	7.289429	1.98574	1	10
Life Satisf	35472	6.888786	2.166989	1	10	25991	6.746528	2.216835	1	10
Income	20328	1617.74	3482.832	2	250000	20498	1257.517	1296.985	75	5625
Unemp_sr	35634	0.0206825	0.1423211	0	1	26257	0.0285638	0.1665802	0	1
Unemp_lr	35634	0.0308133	0.1728139	0	1	26257	0.0360285	0.1863646	0	1
Hours Worked	29983	40.28606	11.7069	1	168	21312	41.30546	12.7853	1	140
Education	35011	3.947331	1.355418	1	7	26105	1.97376	0.7336173	1	4
Health	35570	2.330391	0.966463	1	5	26191	3.010271	1.145108	1	5
Age	35634	1.971263	0.6838658	1	3	26257	3.261721	1.273282	1	5
Mar_1	35364	0.6185665	0.4857454	0	1	26257	0.5898998	0.491861	0	1
Mar_2	35634	0.0930291	0.2904773	0	1	26257	0.0932323	0.2907632	0	1
Mar_3	35634	0.1162934	0.320581	0	1	26257	0.1213772	0.3265713	0	1
Mar_4	35634	0.1645339	0.3707645	0	1	26257	0.1866169	0.3896111	0	1
Children	35359	1.655279	1.383903	0	14	25938	1.596345	1.428991	0	15
Gender	35634	1.568895	0.4952377	1	2	26257	1.581026	0.4934005	1	2
Stgov	35634	0.0747789	0.0195345	0.0424802	0.1387043	26257	0.0809	0.0245646	0.0433155	0.1368173
Stgov1	35634	0.0747743	0.0191848	0.0416576	0.1341795	26257	0.0798974	0.0241151	0.0429177	0.145888
Notes:	In order to keep the table as simple as possible, summary statistics for dummies for professional and house categories are not presented									

The number of observations is around 26000 for 2003 and 35000 for 2007. Structural Government Consumption (Stgov) is measured in percentage and it ranges between 4% and 14%. Structural Government Consumption with trended Government Consumption (Stgov1) is measured in percentage,

and oscillates between 4% and 13.4% in 2007 and between 4% and 14.5% in 2003. It is worth noting that correlations between explanatory variables rarely overcome 30% (the only exceptions being the one between children and age and the one between age and health), which implies that we can disregard multicollinearity issues.

As referred above, we present estimations obtained with the Ordered Probit method and also with the OLS method. While the OLS coefficients are straightforward to interpret, Ordered Probit estimations are more appropriated to estimate equations in which the dependent variable is ordinal, i.e., that have an order but no clear interpretation.

3. The Effect of Structural Government Consumption in Individual Happiness and Life Satisfaction

In this section we present our main results, concerning the influence of structural government consumption in happiness and in life satisfaction. A first note worth mentioning is that results for happiness and life satisfaction are incredibly close. Coefficients also do not change much between regressions that do not include government consumption and those which included those variables. From Table 2 below we can observe highly significant and positive effects of income, education, number of children, being female, being married[6], and health effects (note that health is measured in inverse order, e.g. better health corresponds to lower numbers) as well as negative effects of long-run and short-run unemployment (short-run unemployment decreases its significance in OLS regressions), hours worked (only in OLS regressions) on happiness and life satisfaction. Age presents a U-shaped relationship with happiness and life satisfaction. These results are generally consistent with previous evidence on the individual effects on happiness (see e.g. MacKerron 2012). In fact the literature has consistently presented positive effects of income, 'being married' and health and negative effects of unemployment and a U-shaped relationship with age. Although not so frequent, negative effects of working hours have also been presented by Pouwels *et al.* (2008) and Rätzel (2012). Despite the existence of mixed effects of education and having children in the literature there are a significant number of articles that also present positive effects (e.g. Di Tella *et al.*, 2001 and Hayo and Seifert, 2003 for education effects and Angeles, 2009 for a positive effect of children). Columns (2)-(3), (5)-(6), and (7)-(10) test the introduction of structural government consumption in regressions and present significantly positive effects. In Table 3 the same specifications are applied to the 2003 dataset. Despite the different sample to which the survey was applied in 2003, results are incredibly similar. We can again observe highly significant and positive effects of income, education, number of children, being male, being married, and health effects as well as negative effects of long-run and short-run unemployment and hours worked (only in OLS regressions), together with a non-linear typical relationship with age. Taking into account the OLS estimations, the effects of structural government consumption on happiness and life satisfaction mean that a 1% increase

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[6] Other dummies for the married status such as divorced and widowed, not presented in Tables, have significant negative effects.

in government consumption in percentage of GDP implies less 0.07 to less 0.42 in the happiness and/or life satisfaction scales meaning a decrease between 0.7% and 4.2% in the relative position in the scale. This also means that a 5% increase in government consumption in percentage of GDP may imply a decrease in happiness and/or life satisfaction of 4.5% to 10.5%, representing sizeable effects.

Table 4 presents the marginal effects of regressors on happiness and life satisfaction regarding Ordered Probit estimations, as coefficients cannot be directly interpreted as in the OLS method. These values may be interpreted as the probability of reporting 10 (the maximum value in the scale for both variables) due to a unit increase in each variable.

Table 2: Regressions for Happiness and Life Satisfaction in 2007

Method	Ordered Probit						OLS			
Var. Dep.	Happiness			Life Satisfaction			Happiness		Life Satisfaction	
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	--	--	--	--	--	--	8.908435***	8.924673***	8.246053***	8.282006***
							(0.4376194)	(0.4375811)	(0.5228545)	(0.5216138)
Income	0.00000324*	0.00000324*	0.00000324*	0.00000630**	0.00000630**	0.00000630**	0.0000156***	0.0000153***	0.0000326***	0.0000321***
	(0.00000192)	(0.00000192)	(0.00000192)	(0.00000280)	(0.00000280)	(0.00000280)	(0.00000543)	(0.00000538)	(0.0000111)	(0.000011)
Unemployment_sr	-0.3253964***	-0.3253964***	-0.3253964***	-0.3416401***	-0.3416401***	-0.3416401***	-0.2786565	-0.2802844	-0.5485936*	-0.5509983*
	(0.1119254)	(0.1119254)	(0.1119254)	(0.1182577)	(0.1182577)	(0.1182577)	(0.2913106)	(0.2908684)	(0.3305154)	(0.329653)
Unemployment_lr	-0.4114606***	-0.4114606***	-0.4114606***	-0.4750684***	-0.4750684***	-0.4750684***	-0.5654893**	-0.5653744**	-0.9727996***	-0.9723034***
	(0.1054442)	(0.1054442)	(0.1054442)	(0.1123546)	(0.1123546)	(0.1123546)	(0.2850709)	(0.2846065)	(0.3223266)	(0.3213513)
Hours Worked	-0.0004002	-0.0004002	-0.0004002	-0.0012928	-0.0012928	-0.0012928	-0.0062292***	-0.0061534***	-0.0094005***	-0.009265***
	(0.0008242)	(0.0008242)	(0.0008242)	(0.0008129)	(0.0008129)	(0.0008129)	(0.0013275)	(0.0013278)	(0.0014764)	(0.0014763)
Education	0.0433858***	0.0433858***	0.0433858***	0.0553147***	0.0553147***	0.0553147***	0.1376807***	0.1382745***	0.1944765***	0.1955898***
	(0.0070014)	(0.0070014)	(0.0070014)	(0.0070338)	(0.0070338)	(0.0070338)	(0.0109365)	(0.0109397)	(0.0128151)	(0.0128178)
Health	-0.4025707***	-0.4025707***	-0.4025707***	-0.3336939***	-0.3336939***	-0.3336939***	-0.656023***	-0.6548362***	-0.6315378***	-0.6294041***
	(0.0107717)	(0.0107717)	(0.0107717)	(0.0106194)	(0.0106194)	(0.0106194)	(0.0168559)	(0.0168625)	(0.0186942)	(0.018701)
Age	-0.4936903***	-0.4936903***	-0.4936903***	-0.4212954***	-0.4212954***	-0.4212954***	-0.7221477***	-0.7228026***	-0.6514263***	-0.6525312***
	(0.0733333)	(0.0733333)	(0.0733333)	(0.0734732)	(0.0734732)	(0.0734732)	(0.1182457)	(0.1182698)	(0.1361452)	(0.1362051)
Age^2	0.111361***	0.111361***	0.111361***	0.1169483***	0.1169483***	0.1169483***	0.1844776***	0.1844057***	0.2163215***	0.2161609***
	(0.0188314)	(0.0188314)	(0.0188314)	(0.0190846)	(0.0190846)	(0.0190846)	(0.0307392)	(0.0307471)	(0.0352877)	(0.0353041)
Married	0.3811907***	0.3811907***	0.3811907***	0.2473287***	0.2473287***	0.2473287***	0.7302369***	0.7304895***	0.4236384***	0.4238679***
	(0.0283387)	(0.0283387)	(0.0283387)	(0.0277047)	(0.0277047)	(0.0277047)	(0.0504122)	(0.0504335)	(0.0563734)	(0.0564148)
Children	0.0273806***	0.0273806***	0.0273806***	0.0164**	0.0164**	0.0164**	0.057784***	0.057781***	0.056638***	0.0566317***
	(0.0076089)	(0.0076089)	(0.0076089)	(0.0076766)	(0.0076766)	(0.0076766)	(0.0123764)	(0.0123695)	(0.0140446)	(0.0140395)
Gender	0.069363***	0.069363***	0.069363***	0.0404152**	0.0404152**	0.0404152**	0.0988221***	0.0983017***	0.0218993	0.0211131
	(0.0171341)	(0.0171341)	(0.0171341)	(0.017178)	(0.017178)	(0.017178)	(0.0277852)	(0.0277938)	(0.0315493)	(0.0315654)
Structural Government	--	-16.7998***	--	--	-23.93304***	--	-12.85096***	--	-21.80282***	--
		(1.841745)			(1.910106)		(0.7198392)		(0.8366257)	
Structural Government 1	--	--	-15.28416***	--	--	-21.77386***	--	-13.06357***	--	-22.26389***
			(1.675587)			(1.737781)		(0.7467096)		(0.8699706)
Pseudo R^2/ R^2	0.0795	0.0795	0.0795	0.0847	0.0847	0.0847	0.2323	0.2319	0.2302	0.2296
Number Obs.	17244	17244	17244	17251	17251	17251	17244	17244	17251	17251

Notes: Robust Standard deviation errors in brackets. Significance levels: ***(1%); **(5%); *(10%). Marital Status, professional, housing, and country dummies included in regressions but omitted from the Table. Country dummies are excluded from OLS regressions due to multicollinearity issues.

Table 3: Regressions for Happiness and Life Satisfaction in 2003

Method	Ordered Probit						OLS			
Var. Dep.	Happiness			Life Satisfaction			Happiness		Life Satisfaction	
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	--	--	--	--	--	--	9.271282***	9.383672***	8.307373***	8.386828***
							(0.3235361)	(0.3218961)	(0.359201)	(0.3599114)
Income	0.00006***	0.00006***	0.00006***	0.0001017***	0.0001017***	0.0001017***	0.0002103***	0.0001989***	0.0003787***	0.0003698***
	(0.00000872)	(0.00000872)	(0.00000872)	(0.00000881)	(0.00000881)	(0.00000881)	(0.0000114)	(0.0000114)	(0.0000127)	(0.0000127)
Unemployment_sr	-0.3923318***	-0.3923318***	-0.3923318***	-0.1630192	-0.1630192	-0.1630192	-0.6770241***	-0.6608273***	-0.4104402*	-0.3838719
	(0.1346769)	(0.1346769)	(0.1346769)	(0.1241655)	(0.1241655)	(0.1241655)	(0.2209724)	(0.2208957)	(0.2371154)	(0.2390753)
Unemployment_lr	-0.4855478***	-0.4855478***	-0.4855478***	-0.2563611**	-0.2563611**	-0.2563611**	-0.9348814***	-0.9075121***	-0.7408687***	-0.6998154***
	(0.1327912)	(0.1327912)	(0.1327912)	(0.1225157)	(0.1225157)	(0.1225157)	(0.2186781)	(0.218589)	(0.2345927)	(0.2366777)
Hours Worked	0.000651	0.000651	0.000651	-0.0004375	-0.0004375	-0.0004375	-0.0008669	-0.0007542	-0.0045265***	-0.0044286***
	(0.0007158)	(0.0007158)	(0.0007158)	(0.0007243)	(0.0007243)	(0.0007243)	(0.0011751)	(0.0011749)	(0.0013269)	(0.0013263)
Education	0.0738424***	0.0738424***	0.0738424***	0.0946408***	0.0946408***	0.0946408***	0.125167***	0.1315245***	0.1496074***	0.1568098***
	(0.0124539)	(0.0124539)	(0.0124539)	(0.0125244)	(0.0125244)	(0.0125244)	(0.0208872)	(0.020908)	(0.0225737)	(0.022576)
Health	-0.3597083***	-0.3597083***	-0.3597083***	-0.2903714***	-0.2903714***	-0.2903714***	-0.5819616***	-0.5816426***	-0.5436979***	-0.5446148***
	(0.0097698)	(0.0097698)	(0.0097698)	(0.0093471)	(0.0093471)	(0.0093471)	(0.0144379)	(0.0144143)	(0.0157607)	(0.0157343)
Age	-0.2750215***	-0.2750215***	-0.2750215***	-0.3390571***	-0.3390571***	-0.3390571***	-0.420471***	-0.4156832***	-0.5711091***	-0.565342***
	(0.0438874)	(0.0438874)	(0.0438874)	(0.0443508)	(0.0443508)	(0.0443508)	(0.0728273)	(0.0727576)	(0.0814014)	(0.0813208)
Age^2	0.0425908***	0.0425908***	0.0425908***	0.0601597***	0.0601597***	0.0601597***	0.0739467***	0.0734761***	0.1157746***	0.1152736***
	(0.0071709)	(0.0071709)	(0.0071709)	(0.0072363)	(0.0072363)	(0.0072363)	(0.011955)	(0.0119357)	(0.0132617)	(0.0132373)
Married	0.3736779***	0.3736779***	0.3736779***	0.1964823***	0.1964823***	0.1964823***	0.7839721***	0.7858007***	0.3520444***	0.3501406***
	(0.0273709)	(0.0273709)	(0.0273709)	(0.0272644)	(0.0272644)	(0.0272644)	(0.0555901)	(0.0554051)	(0.0593988)	(0.0591814)
Children	0.0241429***	0.0241429***	0.0241429***	0.0120988*	0.0120988*	0.0120988*	0.0317933***	0.0295716**	0.0085037	0.0070545
	(0.0072689)	(0.0072689)	(0.0072689)	(0.0073352)	(0.0073352)	(0.0073352)	(0.0123717)	(0.0123794)	(0.0135364)	(0.0135283)
Gender	0.100905***	0.100905***	0.100905***	0.0994375***	0.0994375***	0.0994375***	0.1478176***	0.1528428***	0.1528521***	0.1571918***
	(0.017418)	(0.017418)	(0.017418)	(0.0173492)	(0.0173492)	(0.0173492)	(0.0289492)	(0.0288966)	(0.0320482)	(0.0319699)
Structural Government	--	-40.78204***	--	--	-24.1241**	--	-7.44728***	--	-13.50108***	--
		(10.40897)			(10.33933)		(0.6828288)		(0.7299133)	
Structural Government 1	--	--	-42.57944***	--	--	-25.18734**	--	-9.196992***	--	-14.98166***
			(10.86773)			(10.79502)		(0.706923)		(0.7532219)
Pseudo R^2/ R^2	0.0811	0.0811	0.0811	0.0951	0.0951	0.0951	0.2435	0.2467	0.2686	0.2720
Number Obs.	16364	16364	16364	16551	16551	16551	16364	16364	16551	16551

Notes: Robust Standard deviation errors in brackets. Significance levels: ***(1%); **(5%); *(10%). Marital Status, professional, housing, and country dummies included in regressions but omitted from the Table. Country dummies are excluded from OLS regressions due to multicollinearity issues.

Table 4: Marginal Effects for Reporting Maximum Happiness and Life Satisfaction (Ordered Probit)

Dep. Variable Variables	2007		2003	
	Happiness	Life Satisfaction	Happiness	Life Satisfaction
Income	0.0000005*	0.0000008**	0.000009***	0.00001***
Unemployment_sr	-0.0372***	-0.0333***	-0.0477***	-0.0154
Unemployment_lr	-0.0446***	-0.0423***	-0.0556***	-0.0226***
Hours Worked	-0.0001	-0.0002	0.0001	-0.00005
Education	0.0062***	0.0070***	0.0116***	0.0101***
Health	-0.0579***	-0.0420***	-0.0567***	-.0311***
Age	-0.0710***	-0.0530***	-0.0433***	-0.0363***
Age^2	0.0160***	0.0147	0.0067***	0.0064***
Married	0.0512***	0.0296***	0.0555***	0.0203***
Children	0.0039***	0.0021**	0.0038**	0.0012**
Gender	0.0094***	0.0051**	0.0159***	0.0107***
Structural Government/ Structural Government1	-2.4174***/ -2.1993***	-2.7378***/ -3.0093***	-6.425***/ -6.708***	-2.5852**/ -2.6991**

Values in the table mean that, for example, an additional 100 euros in monthly income increases happiness and/or life satisfaction in 0.005% to 0.1%, a relatively modest effect, and with higher effects in 2003 when compared to 2007. However, being unemployed decreases the probability of reporting the highest happiness and/or life satisfaction level from 1.5% to nearly 5%, one additional level of education increases the probability of reporting 10 in the scale from 0.7% to nearly 1.2% and the effect of one additional health point oscillates between a 4.2% and 8% rise in the probability of reporting the highest value in the scale. Belonging to an older age scale decreases 5.30% to 7.10% the probability of reporting 10; being married increases 2.96% to 5.12% the probability of reporting the highest level of happiness and/or life satisfaction. Having children and being female have more modest effects of nearly 0.2% (to 0.4%) and 0.5% (to 1.6%), respectively, of reporting the highest value in the scale. The quantitative effect of the size of governments is remarkable: an additional 1% of GDP in structural government consumption decreases the probability of reporting the highest value in the scale from 2.2% to 6.7%.

Is this effect of government structural consumption is specific for the government related variables used in the above regressions? Or otherwise it represents a deeper mechanism through which government size and imbalances can influence happiness and life satisfaction? In order to answer this question we broaden our use of government indicators and test the influence of alternative variables such as public debt and structural government balances, calculated by the Eurostat in order to access the excessive deficits procedure of the EU, which are also calculated excluding the cyclical component. If high public debt and large government imbalances decrease happiness and life satisfaction we can be more confident on our purposed explanation, that relies on the negative effect that macroeconomic government imbalances may have on happiness and life satisfaction, due to expectations of future taxes and anticipated future austerity measures. In the following Section we thus present results for regressions with the alternative measures and perform a number of additional robustness analyses.

4. Robustness

4.1. The Effect of Alternative Government Measures in Individual Happiness and Life Satisfaction

In this subsection we test the relationship between our two wellbeing variables – happiness and life satisfaction – and other public finance variables. In this case, contrary to what has been done earlier, we use variables that were calculated directly by the Eurostat, in particular those that are used in the excessive deficit procedure. Firstly, we use the structural balance of general government (the negative of the deficit), calculated by the Eurostat using an adjustment based on potential GDP.

Table 5: Regressions for the Influence of Structural Balances on Happiness and Life Satisfaction in 2007

Method	Ordered Probit		OLS	
Var. Dep.	Happiness	Life Satisfaction	Happiness	Life Satisfaction
Regression	(1)	(2)	(3)	(4)
Constant	--	--	9.152001***	7.895816***
			(0.4593724)	(0.5362243)
Income	0.00000302	0.00000668**	0.0000046*	0.0000116**
	(0.00000201)	(0.0000032)	(0.0000027)	(0.00000496)
Unemployment_sr	-0.3989941***	-0.3812285***	-0.611651***	-0.6844939***
	(0.1217822)	(0.1265099)	(0.1950518)	(0.2375645)
Unemployment_lr	-0.4728435***	-0.4602874***	-0.7695548***	-0.8992113***
	(0.1143747)	(0.1200266)	(0.1846912)	(0.2243589)
Hours Worked	0.0000471	-0.00083	-0.0003815	-0.0019673
	(0.0009022)	(0.0009132)	(0.0014003)	(0.0015965)
Education	0.0392657***	0.0571248***	0.0724802***	0.1076615***
	(0.0075009)	(0.0075841)	(0.0115107)	(0.0131294)
Health	-0.4052238***	-0.332615***	-0.6330755***	-0.5785695***
	(0.0118887)	(0.011607)	(0.0182998)	(0.0200027)
Age	-0.4902025***	-0.4020285***	-0.7224199***	-0.7118062***
	(0.0791107)	(0.0794022)	(0.1207544)	(0.1396829)
Age^2	0.1115573***	0.1130982***	0.1610844***	0.1945019***
	(0.0202339)	(0.020488)	(0.0313954)	(0.0361482)
Married	0.3778325***	0.2572562***	0.5707951***	0.4136195***
	(0.0308929)	(0.0299621)	(0.0484506)	(0.0574726)
Children	0.037737***	0.0202083**	0.0585839***	0.0302711**
	(0.0081573)	(0.0082985)	(0.0125975)	(0.0145176)
Gender	0.0529564***	0.0316842*	0.0743292***	0.0407635
	(0.01841)	(0.0184257)	(0.028677)	(0.0324951)
Structural Balance of Gen. Gov.	0.0744701***	0.1115192***	0.0662361***	0.1963935***
	(0.0149839)	(0.0150424)	(0.0128332)	(0.0154294)
Pseudo R^2/ R^2	0.0801	0.0821	0.2765	0.2886
Number Obs.	14810	14816	14810	14816
Notes	Robust Standard deviation errors in brackets. Significance levels: ***(1%); **(5%); *(10%). Marital Status, professional, housing, and country dummies included in regressions, but omitted from the Table.			

In Table 5 we present regressions in which we substitute the structural government consumption variable, which we used earlier, with the new structural balance measure, a measure that is only available for the 2007 database. Since available data on happiness and life satisfaction begins in 2003, we assume that an average of previous year's structural balances (ranging between 2003 and 2007) is influencing happiness and life satisfaction in the current year. We obtain similar values for the effects of individual effects and a strongly positive effect of government structural balances (which is equivalent to a negative effect of deficits). This effect means that a 1% increase in the structural balance of the government would increase

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happiness and life satisfaction in an amount that oscillates between 0.066 and 0.20. Thus, a 5% improvement on government accounts would imply an increase in 1 level (in 10) of life satisfaction and happiness. According to the Ordered Probit results, an additional 1% in deficit (in percentage of GDP) would decrease the probability of reporting the level 10 of happiness in about 1.05% (or in the case of life satisfaction, 1.4%).[7]

Table 6: Regressions for the Influence of Public Debt on Happiness and Life Satisfaction in 2007

Method	Ordered Probit		OLS	
Var. Dep.	Happiness	Life Satisfaction	Happiness	Life Satisfaction
Regression	(1)	(2)	(3)	(4)
Constant	--	--	9.093137*** (0.4421414)	8.086202*** (0.5234773)
Income	0.00000324* (0.00000192)	0.0000063** (0.0000028)	0.00000472* (0.00000257)	0.0000113** (0.00000443)
Unemployment_sr	-0.3253964*** (0.1119254)	-0.3416401*** (0.1182577)	-0.3930418 (0.2722905)	-0.6223497** (0.3080155)
Unemployment_lr	-0.4114606*** (0.1054442)	-0.4750684*** (0.1123546)	-0.5875738** (0.2655505)	-0.9386531*** (0.2986186)
Hours Worked	-0.0004002 (0.0008242)	-0.0012928 (0.0008129)	-0.0011674 (0.0013188)	-0.0029939** (0.0014484)
Education	0.0433858*** (0.0070014)	0.0553147*** (0.0070338)	0.0797399*** (0.0110163)	0.1057201*** (0.0123066)
Health	-0.4025707*** (0.0107717)	-0.3336939*** (0.0106194)	-0.6429343*** (0.016932)	-0.58471*** (0.0184324)
Age	-0.4936903*** (0.0733333)	-0.4212954*** (0.0734732)	-0.7397847*** (0.1148792)	-0.7511699*** (0.1307176)
Age^2	0.111361*** (0.0188314)	0.1169483*** (0.0190846)	0.1636763*** (0.0299124)	0.2016455*** (0.0339936)
Married	0.3811907*** (0.0283387)	0.2473287*** (0.0277047)	0.7342814*** (0.0490837)	0.3931638*** (0.0546116)
Children	0.0273806*** (0.0076089)	0.0164** (0.0076766)	0.0409411*** (0.0121408)	0.0216473 (0.0136121)
Gender	0.069363*** (0.0171341)	0.0404152** (0.017178)	0.0980215*** (0.0271957)	0.0540058* (0.0305405)
Public Debt	-0.1150848*** (0.0126166)	-0.1639501*** (0.0130849)	-0.0099342*** (0.0018004)	-0.0107538*** (0.0018853)
Pseudo R^2/ R^2	0.0795	0.0847	0.2778	0.2980
Number Obs.	17244	17251	17244	17251

Notes   Robust Standard deviation errors in brackets. Significance levels: ***(1%); **(5%); *(10%). Marital Status, professional, housing, and country dummies included in regressions, but omitted from the Table.

In Table 6, we use the general government consolidated gross debt calculated for the excessive deficit procedure (based on the European System of Accounts (ESA) 1995) – averaged from 2002 to 2007, corresponding to the 2007 database. We obtain similar values for the effects of individual variables and a strongly negative effect of public debt. In this case, an additional 1% in debt (in percentage of GDP) would decrease happiness and life satisfaction in 0.01. Thus, to decrease one level in the scale, it would be necessary a rise in public debt equal to 100% of GDP. According to the Ordered Probit results, an additional 1% in debt (in percentage of GDP) would decrease the probability of reporting the level 10 of happiness on about 1.2% (or in the case of life satisfaction, 1.6%).

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[7] Marginal effects for these Ordered Probit estimates are not shown in the text for space considerations, but are available upon request.

Table 7: Regressions for the Influence of Public Debt on Happiness and Life Satisfaction in 2003

Method	Ordered Probit		OLS	
Var. Dep.	Happiness	Life Satisfaction	Happiness	Life Satisfaction
Regression	(1)	(2)	(3)	(4)
Constant	--	--	8.535198***	6.563614***
			(0.3293872)	(0.3593119)
Income	0.00006***	0.0001017***	0.0000851***	0.0001624***
	(0.00000872)	(0.00000881)	(0.0000132)	(0.0000141)
Unemployment_sr	-0.3923318***	-0.1630192	-0.6122368***	-0.3183591
	(0.1346769)	(0.1241655)	(0.215857)	(0.2248268)
Unemployment_lr	-0.4855478***	-0.2563611**	-0.8104646***	-0.5483238**
	(0.1327912)	(0.1225157)	(0.2140113)	(0.2227633)
Hours Worked	0.000651	-0.0004375	0.0009517	-0.0008534
	(0.0007158)	(0.0007243)	(0.0011747)	(0.0012954)
Education	0.0738424***	0.0946408***	0.14637***	0.1893028***
	(0.0124539)	(0.0125244)	(0.0205707)	(0.0219483)
Health	-0.3597083***	-0.2903714***	-0.5698401***	-0.4995031***
	(0.0097698)	(0.0093471)	(0.014979)	(0.0158812)
Age	-0.2750215***	-0.3390571***	-0.4173913***	-0.5818934***
	(0.0438874)	(0.0443508)	(0.0713384)	(0.0783632)
Age^2	0.0425908***	0.0601597***	0.0643098***	0.1021738***
	(0.0071709)	(0.0072363)	(0.0117675)	(0.0128443)
Married	0.3736779***	0.1964823***	0.8112679***	0.389683***
	(0.0273709)	(0.0272644)	(0.0540411)	(0.0566351)
Children	0.0241429***	0.0120988*	0.0367935***	0.0140728
	(0.0072689)	(0.0073352)	(0.0119597)	(0.0128985)
Gender	0.100905***	0.0994375***	0.1500234***	0.1635632***
	(0.017418)	(0.0173492)	(0.0283905)	(0.0307356)
Public Debt	-0.0247495***	-0.0146402**	0.0006326	0.0082016***
	(0.0063169)	(0.0062747)	(0.001095)	(0.0011125)
Pseudo R^2/ R^2	0.0811	0.0951	0.2833	0.3347
Number Obs.	16364	16551	16364	16551

Notes   Robust Standard deviation errors in brackets. Significance levels: ***(1%); **(5%); *(10%). Marital Status, professional, housing, and country dummies included in regressions, but omitted from the Table.

In Table 7 we use the general government consolidated gross debt calculated for the excessive deficit procedure averaged from 1998 to 2003, corresponding to the 2003 database. Table 7 confirms the results obtained so far for the influence of public debt in happiness and life satisfaction in 2003, specifically in the Ordered Probit regressions. Moreover, with a 1% (of GDP) increase in public debt, the probability of reporting 10 in happiness will decrease 0.39%, or 0.16%, if we look at life satisfaction, a much lower effect than the ones obtained in 2007. Contrary to other results, there is a small positive effect of public debt in the OLS regression for life satisfaction. From the OLS regression we can observe that a 1% (of GDP) increase in public debt would contribute to increase life satisfaction in 0.008, which is a quantitatively small effect as it means that to increase 1 unit in the welfare scale, the country would have to rise public debt to 125% (of GDP)!

Thus, with two exceptions in the OLS regressions for 2003, all government related variables; calculated excluding the effects of business cycles, decrease significantly happiness and life satisfaction in European countries.

4.2. Differences Across Income Distribution and Across Eurozone Countries *versus* Non Eurozone Countries

In this section we want to evaluate if the negative effect of government related variables in happiness and life satisfaction is different across income levels and also between Eurozone countries and non-Eurozone countries.[8]

The first issue is important as the literature points out that the eventual positive effect of government variables in happiness and life satisfaction may be due to welfare policies, thus affecting essentially the poorest of the society. We define as high-income, people that present a monthly income that is above the fourth quartile of the distribution and as low-income, people who earn a monthly income that is below the median.

The second issue is important to access potential differences in the effect of government variables on happiness and life satisfaction between the countries of the Eurozone and European Union (EU) countries outside the Eurozone. It would be reasonable to assume that the tighter budgetary limits in the Eurozone would imply a lower effect of government structural balances and consumption in happiness and life satisfaction.

In this section, due to similarities in the results between several tested specifications, we will not present results for Life Satisfaction and the influence of structural government consumption (Stgov). However, these regressions are available upon request. Table 8 analyses the differences from the consideration of a sample with the Eurozone countries and another with other European Countries in 2007. Table 9 does the same for 2003. Table 10 analyses the differences from a group including the richest people in the sample and another group including the poorest people in the sample. Table 11 does the same but for the 2003 data.

In Table 8, we can observe that there are interesting differences between effects within the Euro zone and effects outside the Eurozone: having children seems to contribute to happiness within the countries of the Eurozone (in opposition to what happens in countries outside the Eurozone) and being male seems to increase happiness in countries out of the Eurozone while this is not a significant determinant of happiness in the Eurozone. There are statistical significant differences for unemployment in the two groups of countries, although the differences obtained through the different estimators are not consistent. Concerning the effect of structural government consumption, it seems clear that the effect within the Eurozone is weaker than the effect outside the Eurozone, as expected.

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[8] Since in this section we are dealing with more homogeneous (and smaller) samples, we did not introduce country dummies. Additionally, some of the Ordered Probit regressions have convergence problems when country dummies are included.

Table 8: Regressions for Happiness in 2007 – Eurozone *versus* non-Eurozone Countries

Method	Ordered Probit		OLS	
Countries	Euro	Non-euro	Euro	Non-euro
Regression	(1)	(2)	(3)	(4)
Constant	--	--	9.568148***	9.844022***
			(0.4133738)	(0.4591209)
Income	0.00000854*	0.00000741*	0.0000134*	0.0000113*
	(0.00000496)	(0.00000402)	(0.00000726)	(0.00000587)
Unemployment_sr	-0.4061119***	-0.2242752	-0.1726138	-0.3628983
	(0.1482891)	(0.173098)	(0.349504)	(0.2981225)
Unemployment_lr	-0.4797851***	-0.4068601**	-0.3282303	-0.7541306***
	(0.1361309)	(0.1658498)	(0.337628)	(0.2859747)
Hours Worked	-0.0007465	-0.0062319***	-0.0019358	-0.0111902***
	(0.0011325)	(0.0011539)	(0.0017443)	(0.0019957)
Education	0.0599738***	0.0907292***	0.1032501***	0.1681531***
	(0.0088756)	(0.0105141)	(0.0133168)	(0.0179658)
Health	-0.3885992***	-0.3932346***	-0.594284***	-0.6758371***
	(0.0153012)	(0.0144478)	(0.0235345)	(0.0240676)
Age	-0.5012648***	-0.4032876***	-0.728965***	-0.6375953***
	(0.103176)	(0.1044307)	(0.1534967)	(0.1777471)
Age^2	0.1153914***	0.1084991***	0.1664231***	0.1677141***
	(0.0266491)	(0.0265844)	(0.0400391)	(0.0459263)
Married	0.3729088***	0.3627716***	0.7307092***	0.6149431***
	(0.0385466)	(0.0416106)	(0.068637)	(0.0716264)
Children	0.0532164***	0.0072491	0.0818325***	0.0033682
	(0.0098465)	(0.011278)	(0.0149103)	(0.0195953)
Gender	0.024633	0.1111339***	0.0371588	0.1707168***
	(0.0243913)	(0.023869)	(0.0373751)	(0.0408418)
Structural Government 1	-1.597157**	-11.28381***	-1.640958	-19.54372***
	(0.7121518)	(0.6035382)	(1.083751)	(1.064379)
Pseudo R^2/ R^2	0.0579	0.0739	0.2032	0.2656
Number Obs.	8579	8665	8579	8665

Notes Robust Standard deviation errors in brackets. Significance levels: ***(1%); **(5%); *(10%). Marital Status, professional, and housing dummies included, but omitted from the Table.

In 2003 some differences between the Eurozone and other countries also arise, as can be seen in Table 9 below. Unemployment is now clearly more important as a determinant of happiness in the Eurozone countries. Now, education, having children, and being male are stronger determinants of happiness out of the Eurozone than in the Eurozone countries. Concerning the effect of structural government consumption, we note that the 2007 results are not replicated in 2003. In this year both groups of countries present a significantly negative effect, with no relevant distinction between them.

Table 9: Regressions for Happiness in 2003 – Eurozone versus non-Eurozone Countries

Method	Ordered Probit		OLS	
Countries	Euro	Non-euro	Euro	Non-euro
Regression	(1)	(2)	(3)	(4)
Constant	--	--	9.955948***	9.107915***
			(0.353643)	(0.5121071)
Income	0.0001229***	0.00012***	0.0001999***	0.0001949***
	(0.00000969)	(0.0000119)	(0.0000145)	(0.0000187)
Unemployment_sr	-0.4393708***	-0.3627788	-0.6953463***	-0.3082216
	(0.1554018)	(0.2397473)	(0.2338912)	(0.335646)
Unemployment_lr	-0.5543784***	-0.4549501*	-0.9913455***	-0.4658808
	(0.1565406)	(0.234553)	(0.2416252)	(0.3240451)
Hours Worked	0.000684	-0.0010077	0.0006766	-0.0022035
	(0.0009507)	(0.0010245)	(0.0014689)	(0.0018478)
Education	0.0191021	0.1079797***	0.0477642*	0.2207662***
	(0.0173121)	(0.0175302)	(0.0280206)	(0.0309773)
Health	-0.3540828***	-0.359244***	-0.5361274***	-0.6239364***
	(0.0129667)	(0.0136111)	(0.0189145)	(0.022532)
Age	-0.3052281***	-0.2333526***	-0.4681171***	-0.3756706***
	(0.0599948)	(0.0643621)	(0.0915937)	(0.1156225)
Age^2	0.0486157***	0.0435429***	0.0754449***	0.0710835***
	(0.0099402)	(0.0102383)	(0.0153085)	(0.0185004)
Married	0.3384212***	0.2996646***	0.4953292***	0.5190673***
	(0.0358512)	(0.0420085)	(0.0567593)	(0.0755466)
Children	0.0172804*	0.0247579**	0.0254036*	0.0353257*
	(0.0095494)	(0.0114784)	(0.0151994)	(0.0206338)
Gender	0.034055	0.167137***	0.0412643	0.274095***
	(0.0239688)	(0.0251717)	(0.0373859)	(0.0448405)
Structural Government 1	-5.522587***	-5.268***	-8.029281***	-9.919494***
	0.674037)	(0.58531)56	(1.098872)	(1.076152)
Pseudo R^2/ R^2	8718	0.0738	0.2106	0.2626
Number Obs.	0.0610	7646	8718	7646

Notes	Robust Standard deviation errors in brackets. Significance levels: ***(1%); **(5%); *(10%). Marital Status, professional, and housing dummies included, but omitted from the Table.

There are also interesting differences in the determinants of happiness between the richest and the poorest. In fact, as we can see in Table 10 regarding 2007, for high-income earners, income and unemployment are not statistically significant in the explanation of happiness, a quite intuitive result. It seems that there is also a less significant effect of structural government consumption in high-income agents than in the poorest. This indicates that our effect is different from the potential positive effect that welfare state expenditures have on happiness of the poorest, supporting our approach on the analysis of the influence of structural consumption, which excludes counter-cyclical expenditures such as unemployment subsidies (automatic stabilizers) or some discretionary measures of poverty alleviation.

Table 10: Regressions for Happiness in 2007 – Differences between High-Income Earners and Low-Income Earners

Method	Ordered Probit		OLS	
Individuals	High-Income	Low-Income	High-Income	Low-Income
Regression	(1)	(2)	(3)	(4)
Constant	--	--	8.686379*** (0.7025152)	7.777394*** (0.5805595)
Income	-0.0000000527 0.00000164	0.0006612*** 0.0000562	0.000000661 (0.00000190)	0.0012422*** 0.0001007
Unemployment_sr	-0.2765138 0.1918318	-0.2973768* 0.1584862	-0.2006755 (0.3407431)	-0.1709532 0.4072372
Unemployment_lr	-0.1027897 0.2246365	-0.4291308*** 0.1509682	--	-0.4338661 0.3979505
Hours Worked	-0.0003298 0.0016151	-0.0026463** 0.0011489	-0.0011353 (0.0020309)	-0.0052094** 0.0020842
Education	0.0247298** 0.0125276	0.0936287*** 0.011179	0.0416819*** (0.0157975)	0.1713247*** 0.0202102
Health	-0.3417024*** 0.0202804	-0.3938565*** 0.0153753	-0.4229169*** (0.0272783)	-0.7245214*** 0.0268952
Age	-0.6054246*** 0.1511379	-0.3814767*** 0.1106464	-0.7472762*** (0.1884626)	-0.649254*** 0.1980303
Age^2	0.1522419*** 0.0422918	0.1008702*** 0.0265799	0.1869221*** (0.0532503)	0.1729274*** 0.0479469
Married	0.3001342*** 0.0587513	0.298259*** 0.0424206	0.7497929*** (0.1400172)	0.5259276*** 0.0771083
Children	0.0634793*** 0.0148166	0.0252305** 0.0109304	0.0708687*** (0.0183725)	0.044782** 0.0200138
Gender	0.0698762** 0.032578	0.1055287*** 0.0254113	0.0652152 (0.0410735)	0.1938793*** 0.0460938
Structural Government 1	-2.947929** 1.183408	-5.319798*** 0.6141005	-2.101765 (1.456999)	-9.414843*** 1.127548
Pseudo R^2/ R^2	0.0371	0.0564	0.1119	0.2158
Number Obs.	4821	7874	4821	7874

Notes	Robust Standard deviation errors in brackets. Significance levels: ***(1%); **(5%); *(10%). Marital Status, professional, and housing dummies included, but omitted from the Table. Unemployment_lr was excluded in column (3) due to multicollinearity issues.

In 2003 almost all the results of 2007 are confirmed, as can be seen in Table 11, but in this case also education is a worse predictor of happiness for the richest than for the poorest. The interesting conclusion according to which structural government consumption (negatively) affect more the happiness of the poorest than that of the richest prevails also in 2003.

Table 11: Regressions for Happiness in 2003 – High-Income Earners and Low-Income Earners

Method	Ordered Probit		OLS	
Individuals	**High-Income**	**Low-Income**	**High-Income**	**Low-Income**
Regression	**(1)**	**(2)**	**(3)**	**(4)**
Constant	--	--	9.23637*** (0.4489854)	8.254977*** (0.6469352)
Income	0.0000645*** 0.0000159	0.000616*** 0.0000795	0.0000706*** (0.000019)	0.0012761*** (0.0001521)
Unemployment_sr	-0.1905951 0.309707	-0.4808955** 0.2309623	-0.2462002 (0.3645275)	-0.4703156 (0.5008158)
Unemployment_lr	-0.2081445 0.3253696	-0.5108766** 0.226716	-0.3461647 (0.3849695)	-0.5432214 (0.4940437)
Hours Worked	0.0023433 0.0016229	0.0010261 0.0009959	0.0025536 (0.0019382)	0.0016376 (0.0019042)
Education	-0.0472612* 0.0265393	0.1164895*** 0.0183443	-0.0458441 (0.0313681)	0.235442*** (0.0355814)
Health	-0.3588903*** 0.0189809	-0.3460005*** 0.0146213	-0.4143546*** (0.0220163)	-0.6571576*** (0.0261736)
Age	-0.2934693*** 0.1025129	-0.1926082*** 0.0654079	-0.3745665*** (0.121873)	-0.3456678*** (0.1252738)
Age^2	0.0457528*** 0.0170558	0.0327819*** 0.0101963	0.0591792*** (0.0202666)	0.0589908*** (0.019591)
Married	0.3761402*** 0.0612621	0.3334035*** 0.0451398	0.92045*** (0.1712325)	0.7293897*** (0.0759624)
Children	0.055296*** 0.0172589	0.0047346 0.0109152	0.0610156*** (0.0207616)	0.0097042 (0.0211193)
Gender	0.0760193** 0.0361744	0.1007601*** 0.0260712	0.0874909** (0.042956)	0.1807097*** (0.0502694)
Structural Government 1	-3.373533** 1.374285	-3.191033*** 0.5306012	-3.39242** (1.701827)	-5.952919*** (1.022862)
Pseudo R^2/ R^2	0.0533	0.0485	0.1552	0.1872
Number Obs.	3809	7191	3809	7191

Notes Robust Standard deviation errors in brackets. Significance levels: ***(1%); **(5%); *(10%). Marital Status, professional, and housing dummies included, but omitted from the Table.

4.3. Nonlinearities in the Effect of Government on Happiness

As noted earlier, most literature concluded for a positive effect of government expenditures (or at least of some components of government expenditures) on happiness. Hessami (2010), despite finding a global positive influence of Government expenditures in happiness (when nonlinear terms for government expenditure are not introduced in regressions), also found evidence of an inverted-U relationship between these variables, in a result that seems to be similar to ours. However, a closest look on his figures highlights that the negative part of the non-linear relationship is above the relevant levels of the government share. Thus, Hessami in fact continues to predict a positive relationship between both variables, even if nonlinear terms are introduced in regressions.

We also test the quadratic term of the government expenditures variables in our sample. Interestingly, we find an inverted U-shaped relationship between government structural

expenditures and happiness, for a majority of our measures. However, in our case, this inverted U-shaped relationship is empirically relevant. In fact, the maximum of the inverted-U happens for relatively low levels of structural debt or deficit. This also happens maintaining the overall significance of other variables in the regressions. In Table 12, we present the coefficients for the government variables in several regressions which specification is similar to those in the previous Tables, as well as the implied thresholds of government measures above which there is a negative relationship between the government burden measures and happiness.

Table 12: Nonlinearities in the Effect of Government in Happiness and Life Satisfaction

Method	Ordered Probit			
	Happiness	Life Satisfaction	Happiness	Life Satisfaction
Regression	2007	2007	2003	2003
Structural Government 1	32.12483***	14.49916***	19.47735***	23.28685***
	(2.446421)	(2.478086)	(2.180277)	(2.083482)
Structural Government 1^2	-235.209***	-154.532***	-136.373***	-170.639***
	(13.70642)	(13.78968)	(11.93302)	(11.32107)
Pseudo R^2/ R^2	0.0679	0.0626	0.0719	0.0777
Number Obs.	17244	17251	16364	16551
Implied Threshold	0.06829	0.046913	0.071412	0.068234
Method	OLS			
	Happiness	Life Satisfaction	Happiness	Life Satisfaction
Regression	2007	2007	2003	2003
Structural Government 1	57.63827***	34.8627***	38.61399***	49.7246***
	(4.176799)	(4.784786)	(3.798728)	(3.99138)
Structural Government 1^2	-416.351***	-336.072***	-264.58***	-357.906***
	(23.92334)	(27.22408)	(21.05245)	(21.85127)
Pseudo R^2/ R^2	0.2444	0.2361	0.2560	0.2854
Number Obs.	17244	17251	16364	16551
Implied Threshold	0.069218	0.051868	0.072972	0.069466

Notes   Robust Standard deviation errors in brackets. Significance levels: ***(1%); **(5%); *(10%). Income, Unemployment_sr, Unemployment_lr, Hours Worked, Education, Health, Age and Age squared, Married, Children, Gender, Marital Status, professional, and housing dummies included in regressions, but omitted from the Table.

Considering the median of the structural expenditure measure (6.98% in 2007 and 7.25% in 2003) and the implied threshold levels reported in Table 12, it is always true that the negative effect of structural expenditure in happiness and life satisfaction began before the median and thus being valid for more than 50% of the sample. Alternatively saying, for structural expenditures above nearly 5% to 7%, a strong and significant negative effect of expenditures on happiness occurs. It is also true that a positive effect occurs for government expenditures below those thresholds. When we use our alternative variables for the government weight in the

economy, these results are confirmed, except when we use the structural government balance. In this case, the additional squared term on the Structural Balance of General Government would appear with a significant positive sign, which mean an overall significant positive effect of surpluses, either linear or quadratic. In the case of the public debt variable, for 2007, there is evidence of an inverted U-shaped relationship between debt and happiness and life satisfaction. Threshold values oscillate between 41.1% and 55.1% (while the median is 48.78%), also indicating that above a value near the debt median, there is a negative effect of debt on happiness and life satisfaction. In the 2003 sample, there is a stronger evidence for a linear effect on happiness regressions, as in these cases only the linear term is statistically significant. In the 2003 life satisfaction regressions, there is evidence of the inverted U relationship with threshold levels of debt from 62% (Probit case) to 73% (OLS case).

Figure 1: A Typical Inverted-U Shaped Effect of Structural Government Expenditure Share on Happiness
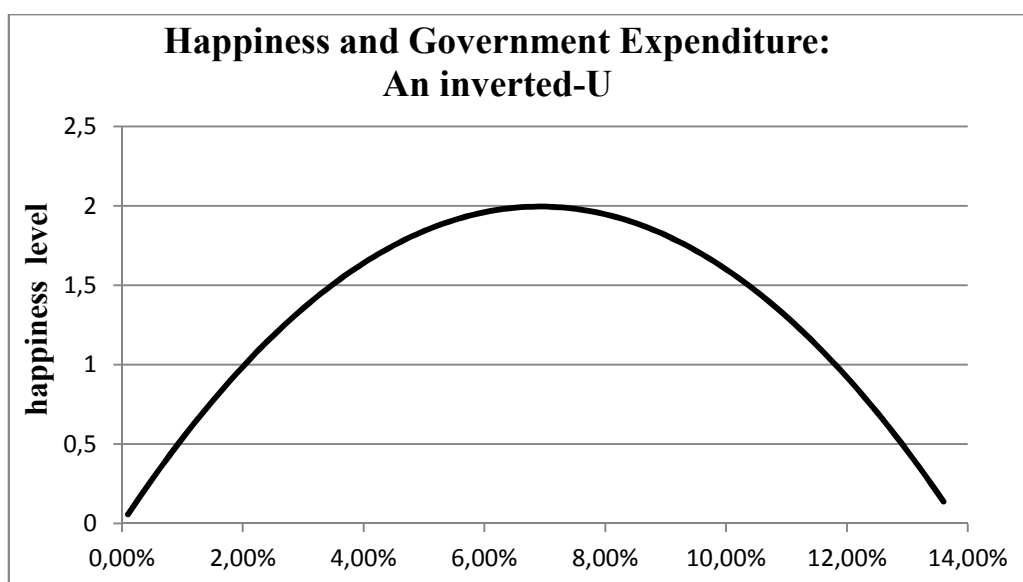

Figure 1 depicts the OLS 2007 regression for happiness and highlights that considering this inverted U relationship, differences in structural government expenditure may account for differences in happiness that can amount to 2 points (which mean a quantitative important effect of 20% of the whole scale).

4.4. The Effect of GDP *per capita* and Inflation on Happiness

As previous literature also included other macroeconomic variables (e.g. Hessami, 2010) as determinants of happiness, we want to further test our results against the insertion of other macroeconomic variables. The most important macroeconomic variables to relate with happiness are GDP *per capita* (which in fact

can be a substitute of average income, as mentioned above in footnote 1) and inflation. Previous literature has found positive effects of GDP *per capita* and negative effects of inflation.[9]

In Table 13 we introduce GDP *per capita* and inflation, separately due to possible multicollinearity issues between these macroeconomic variables. In fact, correlations between inflation and GDP *per capita* are 73% in 2007 and 63% in 2003. Additionally, correlations with structural government consumption are also high (above 55%). Despite this potential multicollinearity effect, when testing all the three macroeconomic variables simultaneously, structural government consumption also affects negatively happiness and life satisfaction in 2003 and 2007, with high statistical significance.

Also worth noting are the statistically significant effects of GDP *per capita* and inflation, in line with previous references. In an additional experiment in which an interaction term between the log of GDP *per capita* and our measure of structural government consumption, we note that despite the high significance of the negative sign of government structural consumption, the interaction appears with a significant positive sign, meaning that the negative effect of the government consumption decreases as *per capita* GDP increases, confirming the effect observed earlier when we split the sample using individual income. This also highlights the even higher importance of keeping with low government consumption in lower income countries. The non-linear inverted U relationship showed earlier is also robust to the introduction of GDP per capita, inflation and the interaction between GDP per capita and structural government consumption.

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[9] GDP *per capita* is the real GDP *per capita* (at chain index PPPs) from the Penn World Tables 7.1 and the inflation rate is the annual average rate of change of the harmonized index of consumer prices (HICP) from the Eurostat. Each enters as averages from 1998 to 2003 to the 2003 regressions and as averages from 2002 to 2007 to 2007 regressions.

Table 13: Regressions for Happiness – Additional Macroeconomic Variables

Method	Ordered Probit			
Regression	2007	2003	2007	2003
Income	0.00000239	0.0000749***	0.00000612**	0.000113***
	(0.00000184)	(0.00000822)	(0.00000269)	(0.00000747)
Unemployment_sr	-0.3120506***	-0.3937637***	-0.321949**	-0.4111775***
	(0.1129276)	(0.1332108)	(0.136126)	(0.1338447)
Unemployment_lr	-0.4224314***	-0.5043331***	-0.4274085***	-0.5296335***
	(0.1063461)	(0.1312603)	(0.1076402)	(0.1318407)
Hours Worked	-0.0011925	0.0012294*	-0.001032	0.0003595
	(0.0008099)	(0.0007038)	(0.0008184)	(0.0006998)
Education	0.0685659***	0.0674656***	0.0648487***	0.0618735**
	(0.0066886)	(0.0123183)	(0.0068048)	(0.0123231)
Health	-0.3823063***	-0.3451089***	-0.3910569***	-0.3562783***
	(0.0104863)	(0.0093744)	(0.0106295)	(0.0092927)
Age	-0.5076532***	-0.2637692***	-0.4878694***	-0.2650389***
	(0.0730736)	(0.0436538)	(0.0742909)	(0.043653)
Age^2	0.1189439***	0.0427534***	0.1174614***	0.0451776***
	(0.01874)	(0.0071082)	(0.0191137)	(0.0071144)
Married	0.3645888***	0.3531178***	0.3562828***	0.3260434***
	(0.0280676)	(0.0271455)	(0.0284321)	(0.0269787)
Children	0.0384466***	0.0209074***	0.0415198***	0.0206059**
	(0.0074359)	(0.0072714)	(0.0074993)	(0.007288)
Gender	0.0680279***	0.1006638***	0.0489423**	0.0977438***
	(0.0170119)	(0.0173027)	(0.0172743)	(0.017315)
Structural Government 1	-3.162588***	-2.352201***	-6.760562***	-5.216548***
	(0.5283027)	(0.4933928)	(0.4449772)	(0.4014171)
GDP pc (in logs)	0.3328221***	0.2635892***	--	--
	(0.0215387)	(0.0257493)		
Inflation	--	--	-0.0370589***	-0.0032596***
			(0.0028624)	(0.0008853)
Pseudo R^2/ R^2	0.0681	0.0714	0.0663	0.0699
Number Obs.	17244	16364	16714	16364
Notes	Robust Standard deviation errors in brackets. Significance levels: ***(1%); **(5%); *(10%). Marital Status, professional, and housing dummies included in regressions, but omitted from the Table.			

Table 13 shows the robustness of the negative effect structural government consumption has on happiness despite the introduction of others (also significant) macroeconomic variables.[10]

5.   Conclusions

Contrary to the scarce existing evidence on the relationship between government consumption, welfare state, and happiness (or life satisfaction), we obtained a robust negative effect of structural government consumption in happiness and life satisfaction. This relationship has been identified despite the effects of the usual individual determinants of happiness (such as income, health, age, children, education, among others) for data collected in the European Quality of Life Survey in 2003 and 2007. The result is broadly maintained for other government related variables, such as structural government balances and public debt (calculated from the excessive debt procedure of the EU). Regarding the effect of government consumption on happiness (or life satisfaction), we have identified a slightly weaker effect within the Eurozone than within other European countries outside the Eurozone. Regarding differences between the

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[10] As before, the relationship was also tested for life satisfaction and using the OLS regression, always with similar results.

richest and the poorest in Europe, we could identify a relatively stronger effect on the poorest. This finding seems to indicate that this long-run effect is not capturing the reasonable positive effect that welfare counter-cyclical expenditures, such as unemployment subsidies, may have in the poorest and emphasizes that the effect highlighted in this paper is a structural (or long-run) one, mostly linked with fear of future taxes or austerity measures. Even when we consider a quadratic term for the government variables, there is evidence for a statistically significant inverted-U shaped relationship between government variables and happiness that suggests that government burden decreases happiness above relatively low values of debt and deficits. When the U-shaped relationship does not arise, the linear or non-linear strictly positive relationship arises, as is the case with the structural balance of government account. Our final robustness analysis also found negative effects of structural government consumption on happiness and life satisfaction given the also significant effects of other macroeconomic variables such as GDP *per capita* and inflation.

These results are challenging to the literature as, contrary to some previous ones, indicate a negative and robust effect of government expenditures and imbalances on happiness and life satisfaction, which should decrease the incentives of politicians to increase the government size in order to appraise their electors. These results are also consistent with people valuing both present and future prospects of macroeconomic stability and fearing future measures of austerity. Future research may test this relationship using future waves of the EQLS, while maintaining the definition of structural government consumption.

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APPENDIX

Table 1.A – Definition and Sources Variables

NAME	ABREVIATION	DEFINITION AND MEASUREMENT	SOURCES
COUNTRY	cnt	**Data for 2007**	
		1- Austria	
		2- Belgium	
		3- Bulgaria	
		4- Cyprus	
		5- Czech Republic	
		6- Denmark	
		7- Estonia	
		8- Finland	
		9- France	
		10- Germany	
		11- UK	
		12- Greece	
		13- Hungary	
		14- Ireland	
		15- Italy	
		16- Latvia	
		17- Lithuania	
		18- Luxembourg	
		19- Malta	
		20- Netherlands	
		21- Poland	
		22- Romania	
		23- Slovakia	
		24- Slovenia	
		25- Spain	
		26- Sweden	
		27- Turkey	
		28- Portugal	
		29- Croatia	
		30- Norway	
		31- Macedonia	
		Data for 2003	
		1- Austria	
		2- Belgium	
		3- Bulgaria	
		4- Cyprus	
		5- Czech Republic	
		6- Denmark	

		7-	Estonia	
		8-	Finland	
		9-	France	
		10-	Germany	
		11-	UK	
		12-	Greece	
		13-	Hungary	
		14-	Ireland	
		15-	Italy	
		16-	Latvia	
		17-	Lithuania	
		18-	Luxembourg	
		19-	Malta	
		20-	Netherlands	
		21-	Poland	
		22-	Romania	
		23-	Slovakia	
		24-	Slovenia	
		25-	Spain	
		26-	Sweden	
		27-	Turkey	
		28-	Portugal	
AGE CATEGORY	agec		**For 2007:**	**European Quality of**
		1-	18-34	**Life Surveys (EQLS)**
		2-	35-64	
		3-	+65	
			For 2003:	
		1-	18-24	
		2-	25-34	
		3-	35-49	
		4-	50-64	
		5-	+65	
AGE CATEGORY SQUARED	$Agec^2$		Calculated using the squared age´s values.	
GENDER	gen	1-	Male	**European Quality of**
		2-	Female	**Life Surveys (EQLS)**
MARITAL STATUS	mar1	1-	Married or living with partner; 0 otherwise	**European Quality of Life Surveys (EQLS)**
	mar2	1-	Separated or divorced and not living with partner; 0 otherwise	
	mar3	1-	Widowed and not living with partner; 0 otherwise	

	mar4	1- Never married and not living with partner; 0 otherwise	
EDUCATION	edu	**Education level for 2007– ISCED**	**European Quality of Life Surveys (EQLS)**
		1- Isced 0 = pre-primary education	
		2- Isced 1 = primary education	
		3- Isced 2 = lower secondary education	
		4- Isced 3 = upper secondary education	
		5- Isced 4 = post-secondary non terciary education	
		6- Isced 5 = first stage of tertiary education	
		7- Isced 6 = second stage of tertiary education (advanced research qualification)	
		Education level for 2003– ISCED	
		1 Primary education	
		2 Secondary education	
		3 University	
		4 None	
NR. CHILDRENS	chil	Number of children	**European Quality of Life Surveys (EQLS)**
TYPE OF HABITATION	Hou1	1- Own without mortgages	**European Quality of Life Surveys (EQLS)**
	Hou2	1- Own with mortgages	
	Hou3	1- Tenant, paying rent to private landlord	
	Hou4	1- Tenant, paying rent in social/voluntary/municipal housing	
	Hou5	1- Accommodation is provided rent free	
	Hou6	1- Other	
INCOME	inc	Household´s total net monthly income, in euro	**European Quality of Life Surveys (EQLS)**
UNEMPLOYMENT	Unemp12 UnempX	Dummies for Unemployed less 12 m and for Unemployed 12 m or more	**European Quality of Life Surveys (EQLS)**
NR. HOURS WORKED	hwk	Number of hours work(ed) per week, including any paid or unpaid overtime	**European Quality of Life Surveys (EQLS)**
LIFE SATISFACTION	lif	Life Satisfaction Scale - all things considered, how satisfied would you say you are with your life:	**European Quality of Life Surveys (EQLS)**
		1- 1 (very dissatisfied)	
		2- 2	
		3- 3	
		4- 4	

		5- 5	
		6- 6	
		7- 7	
		8- 8	
		9- 9	
		10- 10 (Very satisfied)	
HAPPINESS	hap	Happiness Scale - taking all things together, how happy would you say you are, using a scale: 1- 1(Very unhappy) 2- 2 3- 3 4- 4 5- 5 6- 6 7- 7 8- 8 9- 9 10- 10 (Very happy)	**European Quality of Life Surveys (EQLS)**
HEALTH	hea	In general, would you say your health is: 1- Very good 2- Good 3- Fair 4- Bad 5- Very bad	**European Quality of Life Surveys (EQLS)**
STRUCTURAL GOVERNMENT CONSUMPTION	stgov	$$GDP = \{rgdpch \times (POP \times 1000)\}$$ Using Hodrick-Prescott Filter in EViews, transformed GDP in GDP Trend and GDP Cycle **Government Consumption** $$= \{[Kg \times rgdpl \times (POP \times 1000)] \div 100\}$$ **Structural Government Consumption** $$= \left\{\frac{Government\ Consumption}{GDP\ Trend}\right\}$$	**Penn World Table:** Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 7.1, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, Nov 2012. Variables: • **POP** – Population, in thousands • **rgdpch** - PPP Converted

		Average 2002 – 2007 for the 2007 data Average 1998 – 2003 for the 2003 data	GDP *Per capita* (Chain Series), at 2005 constant prices • **kg** - Government Consumption Share of PPP Converted GDP *Per capita* at 2005 constant prices [rgdpl] • **rgdpl** - PPP Converted GDP *Per capita* (Laspeyres), derived from growth rates of c, g, i, at 2005 constant prices
STRUCTURAL GOVERNMENT CONSUMPTION WITH TRENDED GOVERNMENT CONSUMPTION	stgov1	**GDP** = $\{rgdpch \times (POP \times 1000)\}$ Using Hodrick-Prescott Filter in EViews, transformed GDP in GDP Trend and GDP Cycle **Government Consumption** = $\{[Kg \times rgdpl \times (POP \times 1000)] \div 100\}$ Using Hodrick-Prescott Filter in EViews, transformed Government Consumption in Government Consumption Trend and Cycle **Structural Government Consumption with trended Government Consumption** =	**Penn World Table:** Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 7.1, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, Nov 2012. Variables: • **POP** – Population, in thousands • **rgdpch** - PPP Converted GDP *Per capita* (Chain

		$$\left\{\frac{Government\ Consumption\ Trend}{GDP\ Trend}\right\}$$ Average 2002 – 2007 for 2007 Average 1998 – 2003 for 2003	Series), at 2005 constant prices • **kg** - Government Consumption Share of PPP Converted GDP *Per capita* at 2005 constant prices [rgdpl] • **rgdpl** - PPP Converted GDP *Per capita* (Laspeyres), derived from growth rates of c, g, i, at 2005 constant prices
STRUCTURAL BALANCE	def	Average 2003 – 2007 for the 2007 data. There is no data available for 2003.	**Eurostat: AMECO – database of the European Commission´s Directorate General for Economic and Financial Affairs (DG ECFIN):** Variable: Structural balance of general government: Adjustment based on potential GDP: Excessive deficit procedure (UBLGAPS)
PUBLIC DEBT	gdebt	Average 2002 – 2007 for the 2007 data. Average 1998 – 2003 for the 2003 data.	**Eurostat: AMECO– database of the European Commission´s Directorate General for Economic and**

	Financial Affairs (DG ECFIN): Variable: General government consolidated gross debt: Excessive deficit procedure (based on ESA 1995) (UDGG)