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Articles

THE WELFARE STATE AND ECONOMIC GROWTH

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Abstract:
The paper examines whether redistribution policy is bad or good for economic growth by analysing government expenditure on the welfare state in the old and new post-socialist EU countries from the mid-1990 to 2008. Due to the differences among countries fixed effect is included in the model using panel data. We find negative association between the mean values of expenditure on the welfare state in several time periods and the subsequent GDP growth rate for EU-25 and also for the subsets (EU-15 and EU-10) of the EU countries. When taking into account explicitly the government budget constraint and applying dynamics the same conclusion can be drawn for EU-25. Welfare state expenditure has statistically significant negative coefficient confirming the postulated hypothesis of a negative impact on the GDP growth rate.

Keywords: government expenditure, welfare state, economic growth, panel fixed effects

JEL Classification: E6, H5

1. Introduction

The welfare state exists to a certain degree in all Member States of the European Union. The theoretical arguments support the existence of different forms of the welfare state not only for well-known equity reasons but also in efficiency terms.

The term "welfare state" is used in this paper (Barr, 2004) as a shorthand for the state´s activities in four broad areas: cash benefits, health care, education and housing. In broad terms the contemporary welfare state comprises cash benefits and benefits in kind.

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The demographic development in Europe will question the long-term sustainability of public finances in the EU (putting aside the current fiscal problems thanks to financial and economic crisis). The assessment carried out regularly by the European Commission summarises the projected change in age-related expenditure as a share of GDP over the long term. These expenditures (pensions, health care, education) represent the main bulk of spending on the welfare state. Projected changes from 2010 to 2030 and 2050 show the increase especially in Cyprus, Slovenia, Spain, Luxembourg, the Czech Republic, Hungary, Ireland and Belgium (European Economy - Public Finances in EMU, 2008, 2007). Summarizing, both the old EU countries and recently acceded Member States will face considerable sustainability gaps.

Conventional wisdom says that redistribution through cash payments and benefits in kind is growth decelerating because of negative incentive effects on economic agents. On the contrary, some authors suggest that redistribution may be good to a certain degree. In the development models (Brown, Jackson, 1994) in the developed phase of the economy there is less need for infrastructural expenditure or for the correction of market failure. Instead transfer payments (in cash or in kind) become the main items of expenditure. But once such forms of expenditure become established, they are difficult to reduce. They also increase with heightened expectations and through the effect of the above mentioned ageing population in EU Member States.

Public spending is seen as having an important role in supporting economic growth but it also is a key variable influencing the sustainability of public finance. Over the last years the importance of quality of public finance has been brought to the forefront of public debates. Enormously increasing public deficits caused by different stimulus packages raise the pressure to use resources more efficiently. From this point of view some progress has been made by looking at the composition of expenditure by functions of government (COFOG) which we utilize in this paper by measuring the extent of the welfare state.

The remainder of the paper is organized as follows. In Section 2 we summarize the most relevant literature stressing the different possible approaches. In Section 3 we present trends in expenditure on the welfare state in the Member States of the European Union. In the following section partial approach-simple correlations with mean values has been discussed. In Section 5 the attention is concentrated on the explicit use of government budget constraint-both expenditure and taxes are analysed and some conclusions are drawn. In Section 6 we discuss the conclusions and caveats.

2. Literature Review

The relationship between government expenditure and economic growth can be examined from different angles of approach.

In a seminal paper Tanzi and Schuknecht (1997) analyse the level of public spending in full-fledged market economies and try to find the level of spending bringing much of the potential social gain. Spending beyond that level (between 30 and 40 percent of GDP) does not contribute much. Masson (2000) examines in what areas should a European fiscal policy operate, and finds no support for the view that redistribution is favourable to growth (15 EU countries in the period 1993-98).

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Gerson (1998) stresses the role of well-targeted government expenditures on health, education and infrastructure and underlines that spending on social services to maintain the social fabric may increase growth if it contributes to political stability.

The goal of often quoted paper of Easterly and Rebelo (1993) is to provide a comprehensive summary of the statistical association between measures of fiscal policy and the rates of growth. The empirical findings (data set of about 100 countries for the period 1970-1988) are summarized by the list of ten stylized facts. Their main conclusion is that in endogenous growth models fiscal policy can be one of the main determinants of the observed differences in growth experiences.

Kocherlakota and Yi (1997) construct a simple model that nests endogenous and exogenous growth as special cases and then derive the reduced-form relationships that underlie their empirical work. Long-time series of real *per capita* GDP growth rate (USA 1891-1991, United Kingdom 1831-1991) and two measures of public capital and income taxes enable them to select optimal time lag (8 years). Their central finding is that when both the spending and the revenue variables are included in a growth regression, they obtain estimates that are inconsistent with exogenous growth and consistent with endogenous growth.

It was probably L. Helms (1985) who underscored first the importance of considering the incentives provided by expenditures as well as taxes recognizing the government budget constraint. His growth equation has an autoregressive form enabling him to calculate both the short-run and long-run effects of a change in selected fiscal variables.

Similarly Mofidi and Stone (1990) stress that economic performance is dependent not only upon taxes, but also upon the types of expenditures the taxes finance. They examine the impact of state and local taxes on net investment and employment when the revenues are devoted to transfer-payment programs.

Kneller, Bleaney and Gemell (1999) find strong support for the predictions of endogenous growth models that structure of taxation and public expenditure can affect the steady-state growth rate. They criticize the partial studies focused exclusively on one side of the budget only and stress the importance of the implicit financing assumptions originally suggested by Helms.

In the following paper the same authors Bleaney, Gemell, Kneller (2001) try to evaluate the role of fiscal policy in both neoclassical and endogenous growth models by examining the impact of various sub-divisions of expenditure and taxes on growth. The authors discuss several difficulties arising during the empirical investigations (***e.g.*** the data limitation, the endogeneity of regressors in growth equations, the necessity to capture the long-run behaviour).

Afonso and Furceri (2008) try to answer the question if social contributions (size and volatility) have a sizeable, negative and statistically significant effect on growth in a paper analysing a set of OECD and EU countries in 1970 to 2004.

Afonso and Allegre (2008) test whether a reallocation of government spending can enhance economic growth in a set of European countries in the period 1970-2006 applying modern panel data techniques. Their theoretical model summarizes the key findings of the relationship of public expenditure with economic growth. They are able to identify the negative impact of social security contributions on economic growth. On functional expenditure the study points to a negative impact of health and social

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protection expenditures on production and the growth-enhancing behaviour of public expenditure on education.

3. Descriptive Statistics

Under the heading expenditure on the welfare state (WSE) we understand in the empirical analysis spending by government on 4 items at the first level (division) of COFOG classification (The international Classification of the Functions of Government. Manual on Sources and Methods of the Compilation of COFOG Statistics, Eurostat, 2007).

GF.10 Government Expenditure on Social Protection

GF.09 Government Expenditure on Education

GF.07 Government Expenditure on Health

GF.06 Government Expenditure on Housing and Community Amenities.

The functional breakdown of government expenditure is based on COFOG, which was developed by the OECD and adopted as a standard in national accounts. Eurostat collects and publishes COFOG data from European countries based on the harmonized accounting principles in the European System of Accounts 1995 (see Box 1).

Until recently COFOG data has only been available in Europe on a higher aggregated level (COFOG level I with 10 items). However, due to the focus on the quality of public finances, there is now a strong user demand for more detailed (COFOG level II) data which breaks down government expenditure into 69 different functional groups and enable more detailed analysis of WSE.

Box 1

Social Expenditure in COFOG and ESA 95

Some authors use directly data from the European System of Accounts 1995 (ESA 95) as a proxy for social expenditure because of longer time series neglecting the differences between COFOG and ESA 95.

The ESA 95 transmission programme compares categories for COFOG analysis and ESA 95 transactions (Manual on COFOG Statistics, 2007; Statistics in Focus, Economy and Finance, 2005). The programme shows the breakdown by function and transactions: the column headings refer to the ESA 95 transaction codes and the row headings to the COFOG divisions. We use data from the transmission programme (data for 2003, million euro) to compare social protection data in the COFOG classification and the social payment in ESA 95.

Table 1 discovers the measure of bias when using social protection (division 10 of COFOG) instead of a sum of some headings from ESA 95. Under social payments in ESA 95 one understands social benefits other than social transfers in kind (D.62) plus three sub-headings of social transfers in kind.

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Table 1
Significance of Social Protection (COFOG) for Social Payment (ESA 95) in EU-25 (social protection in % of social payment)

AT	BE	DE	DK	EL	ES	FI	FR	IE	IT	LU	NL	PT
79.0	71.5	75.6	91.2	100	83.6	90.7	79.2	90.6	87.6	77.9	76.5	79.5
SE	**UK**	**CZ**	**EE**	**LT**	**LV**	**HU**	**PL**	**SI**	**SK**			
86.9	100	68.5	82.3	85.1	96.9	89.2	99.8	85.1	97.5			

Source: Author´s calculations based on Table 3 (Statistics in Focus, 2005).
Note: Usual cross-section identifiers used in this table and in the following panel analysis are for new countries: Bulgaria (BG), Czech Republic (CZ), Estonia (EE), Hungary (HU), Lithuania (LT), Latvia (LV), Poland (PL), Romania (RO), Slovenia (SI), Slovakia (SK). For old EU countries: Austria (AT), Belgium (BE), Germany (DE), Denmark (DK), Greece (EL), Spain (ES), Finland (FI), France (FR), Ireland (IE), Italy (IT), Luxembourg (LU), the Netherlands (NL), Portugal (PT), Sweden (SE), United Kingdom (UK).
Data for Bulgaria and Romania are missing.

In some countries, following the table, first of all in the Czech Republic, but also Germany, Denmark and the Netherlands data for social protection (COFOG) represent only about ¾ of social payment in ESA 95 according to this breakdown. These differences must be keept in mind by the researcher when using longer-time series of social payments.

The broad-brushed description of the development of WSE (as percentage of GDP) reveals the well-known fact, that the ratio of WSE is higher in the majority of EU-15 than in post-socialist newly acceded members (EU-10; see Table 2).

For 6 from 15 old EU countries (Austria, Denmark, Spain, Finland, Ireland and Sweden) the maximum level of WSE was reached in 1995 (taking into account our data set) and since then the path is downward. The exceptions are Greece, Italy and the United Kingdom with peak in 2007 (maybe it is not a chance – these countries have to cope with enormous difficulties *vis-à-vis* the sustainability of public finances in these months). The same can be said for Hungary (the peak in 2006) – a trouble maker among the post-socialist countries, whereas the majority of EU-10 countries exhibited the peak at the beginning of the 21st century.

Table 2 shows WSE as a percentage of GDP to give an idea of the size of the welfare state, for its concept is significant first of all in Scandinavian countries (in Sweden peaking even at 42.6% in 1995, in Denmark 39.8% and the same figure in Finland also in 1995) supplemented by France (37.6% in 2004), Austria (37.4% in 1995) and Germany (34.3% in 2003). On the other end the lowest level has been in Ireland (maximum 24.5% in 1995 with a downward path since this year till 2000 when again an upward path begins). In the sample of EU-10 countries only Slovenia, Hungary and Poland exhibit values comparable with those of EU-15, with Baltic countries, Romania and Bulgaria having the ratio hovering around 20% of GDP. Government WSE appears relatively stable across countries in both subsamples with outliers Portugal and Finland (high standard deviations in EU-15).

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Table 2
Welfare State Expenditure – Main Descriptive Statistics (% of GDP)

	Mean	Maximum	Minimum	Stand.dev.	Observations	Time period
AT	35.39	37.40	33.40	1.38	14	1995-2008
BE	30.64	31.40	29.30	0.63	14	1995-2008
DE	32.86	34.30	30.70	1.02	14	1995-2008
DK	38.36	39.80	36.80	0.95	14	1995-2008
EL	24.85	28.70	22.20	1.93	14	1995-2008
ES	24.24	25.70	23.20	0.82	14	1995-2008
FI	34.80	39.80	32.20	2.48	14	1995-2008
FR	36.86	37.60	35.70	0.61	14	1995-2008
IE	21.94	24.50	19.00	1.47	13	1995-2007
IT	29.63	31.20	28.80	0.72	14	1995-2008
LU	26.81	28.50	24.60	1.28	14	1995-2008
NL	27.65	29.40	26.00	0.91	13	1996-2008
PT	27.81	31.30	24.50	2.44	13	1995-2007
SE	38.59	42.60	35.90	1.89	14	1995-2008
UK	28.21	30.90	25.90	1.62	14	1995-2008
BG	22.20	23.70	20.00	1.25	8	2000-2007
CZ	25.19	27.20	23.10	1.38	14	1995-2008
EE	22.29	25.40	19.90	1.81	14	1995-2008
HU	28.24	30.10	25.60	1.44	7	2001-2007
LT	21.57	23.60	20.20	1.28	9	2000-2008
LV	21.84	24.60	20.00	1.15	13	1996-2008
PL	28.84	30.60	26.90	1.33	7	2002-2008
RO	19.58	21.10	19.00	0.81	6	2002-2007
SL	29.97	31.00	27.70	1.00	9	2000-2008
SK	23.56	25.90	20.40	1.50	14	1995-2008

Source: Author´s calculations.

Disentangling WSE in Table 3 we see that the decisive item is social protection (spr) representing over 50% of WSE in the majority of countries. Quantitatively important there are also expenditure on health (hea) and education (edu), whereas expenditure on housing and community amenities are almost negligible and represent not shown residual.

The mean values of ratio of social protection on WSE are very high, as expected, in Scandinavian countries, but also in Greece and Germany. Less than half of WSE they reach in Ireland, Estonia and Romania. As concerns the impact of social protection on the rate of economic growth they are regarded practically in all relevant papers as having negative impact.

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Table 3
Composition of WSE

	spr		edu		hea	
	Mean	**% WSE**	**Mean**	**% WSE**	**Mean**	**%WSE**
AT	21.03	59.4	5.84	16.5	7.66	21.6
BE	17.79	58.1	5.87	9.2	6.64	21.7
DE	21.44	65.2	4.24	12.9	6.24	19.0
DK	23.56	61.4	7.24	18.9	6.91	18.0
EL	17.16	69.1	2.89	11.6	4.42	17.8
ES	13.40	55.3	4.43	18.3	5.41	22.3
FI	21.79	62.6	6.23	17.9	6.34	18.2
FR	21.37	58.0	6.28	17.0	7.51	20.4
IE	9.74	44.4	4.46	20.3	6.38	29.1
IT	17.95	60.6	4.71	15.9	6.21	21.0
LU	16.66	62.1	4.59	17.1	4.75	17.7
NL	17.39	62.9	5.03	18.2	4.37	15.8
PT	13.97	50.2	6.75	24.3	6.50	13.4
SE	23.61	61.2	7.11	18.4	6.61	17.1
UK	15.63	55.4	5.39	19.1	6.21	22.0
BG	12.99	58.5	4.08	18.4	4.50	20.3
CZ	13.04	51.8	4.54	18.0	6.43	25.5
EE	10.61	47.6	6.76	30.3	4.41	19.8
HU	16.24	57.5	5.73	20.3	5.39	19.1
LT	10.97	50.9	5.72	26.5	4.52	21.0
LV	11.62	53.2	5.61	25.7	3.65	16.7
PL	17.11	59.3	5.93	20.6	4.50	15.6
RO	9.77	49.9	3.85	19.7	3.97	20.3
SL	16.73	55.8	6.31	21.1	6.33	21.2
SK	13.38	56.8	3.71	15.7	5.50	23.3

Source: Author´ s calculations.

Following the endogenous growth theory the expenditure on education are growth supporting (the highest ratios are seen for the Baltic states and Portugal). The expenditure on health represent a significant portion of WSE in the Ireland, the Czech Republic and Slovakia with Portugal, Poland and the Netherlands lagging behind.

From Table 2 one can deduce that not only the ratio of WSE on GDP, but also the composition of this aggregate is relevant.

4. Partial Approach – Simple Correlations with Mean Values

The relationship of economic growth and the level and composition of government expenditure has been investigated for many years (Hindriks and Myles, 2006 and many others). One of the often discussed questions is the direction of causality (Bleaney, Gemmell, Kneller, 2001; Afonso, Allegre, 2008).

Keynesian propositions treat government expenditure as an exogenous factor, as the right-hand side variable and GDP growth as the left-hand side variable in the growth regressions. On the other side, government expenditure can be seen as being

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determined by the preferences of the population as expressed through the political system. Wagner´s law (Brown, Jackson, 1994) implies that government expenditure can be treated as an endogenous factor relating government expenditure to GDP via the income elasticity of demand for government provided goods and services.

The direction of causality can be settled in a dynamic setting only. In what follows we correlate WSE and GDP growth rate taking into account that in addition to the autoregressive behaviour of economic growth the expenditure items induce an impact on growth distributed across several years (Afonso, Allegre, 2008).

Due to the data limitations, especially for EU-10 (see time periods in Table 2), we account for the longer-term relationship by using of variables expressed in larger frequency periods (Masson, 2000). Four spending items serving as a proxy for the extent of the welfare state (WSE) are the mean values for 2002-6 and sub-periods 2002-4. 2004-6, respectively and the subsequent growth rates of GDP are the mean values for 2006-8 assuming the causality runs from WSE to GDP growth rate. This selection of the periods is dictated by the data availability which does not allow to take into account a longer period.

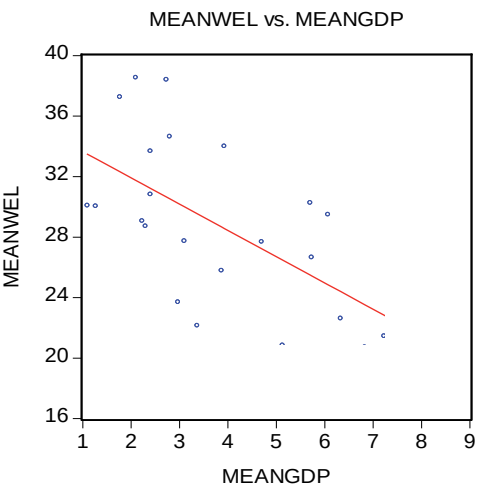
Figure 1 indicates the negative association between the mean values for WSE and the subsequent GDP growth rate for our sample dataset. Estimated correlations of WSE and subsequent GDP growth rate are summarized in Table 4.

Table 4
Correlation Matrices for Mean Values (WSE 2002-6, GDP growth rate 2006-8)

	welfare state expenditure
EU-25 GDP growth rate	-0.6588
EU-15 GDP growth rate	-0.3516
EU-10 GDP growth rate	-0.6267

Source: Authors Calculations

Figure 1
WSE and GDP Growth Rate, EU-25 (mean values of WSE 2002-6 and GDP growth rate 2006-8)



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Negative correlation is smaller for EU-15 and much higher for EU-10. If we divide the period 2002-2006 into two parts, then for EU-25 for WSE in 2002-4 the impact on the growth rates in 2006-8 gives the negative correlation -0.6267. WSE in 2004-6 hence influenced the in Table 3 mentioned GDP growth rate with a higher negative correlation -0.6954.

Table 4 depicts the aggregate impact of WSE. Having disentangled the internal composition of the WSE we calculate in a similar way correlations for the three main items: social protection (spr), education (edu) and health (hea) - see Table 5.

Table 5
Correlation Coefficients for Mean Values (expenditure on social protection, education and health 2002-6, GDP growth rate 2006-8)

	Social protection	Education	Health
EU-25 GDP growth rate	-0.5800	-0.3611	-0.6962
EU-15 GDP growth rate	-0.1417	-0.4304	-0.6051
EU-10 GDP growth rate	-0.4175	-0.5882	-0.3869

More detailed information in Table 5 shows, maybe rather surprisingly, also the negative correlation between expenditure on education and the growth rate for all our samples.

Among the EU-10 a closer look reveals the differences between the "central" post-socialist countries (the Czech Republic, Hungary, Poland, Slovakia and Slovenia) and the "peripheral" countries (Bulgaria, Estonia, Latvia, Lituania and Romania). In the latter group the differences between the mean values of the WSE and GDP growth rate are higher confirming the development theory.

Table 6
Central and Peripheral Postsocialist EU Countries (mean of the WSE 2002-6 and mean GDP growth rate 2006-8)

Central countries	GDPmeans	WSEmeans
CZ	5.73	26.66
HU	2.30	28.72
PL	6.07	29.48
SL	5.70	30.26
SK	8.63	23.36
unweighted average	5.69	27.70
peripheral countries		
BG	6.33	22.62
EE	5.13	20.84
LT	6.83	20.72
LV	7.23	21.46
RO	7.57	19.52
unweighted average	6.62	21.03

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Lower growth rates and higher WSE distinguish "central" post-socialist EU countries from their "peripheral" counterparts, which are catching up on the EU average more quickly. Last but not least, we must be aware that the results of the partial approach are with a grain of salt.

5. Government Budget Constraint – Expenditure and Taxes

In his original article Helms (1985) stresses that neither expenditure nor taxes cannot be studied in isolation. To sort out the countervailing effects of expenditure and taxes one must explicitly recognize the government budget constraint. His results indicate that state and local tax increases significantly retard growth when the revenue is used to fund transfer payments. However, when the revenue is used instead to finance improved public services the favourable impact may more than counterbalance the disincentive effects of the associated taxes.

With a comprehensive accounting, Mofidi and Stone (1990) demonstrate that state and local taxes and expenditures form (at least a near) budget identity, implying (at least nearly) perfect multicollinearity. Therefore, some component must be omitted to obtain precise estimates of coefficients of the remaining components. They follow Helms in omitting transfer-payment expenditures, so that "estimated coefficients on the tax and other expenditure variables represent the effect of increasing that variable through an exactly offsetting change in transfer payment expenditures" (Mofidi, Stone, 1990, p. 687).

A key feature of this approach is to recognize that the sum of the uses must identically equal the sum of sources; both the sources and the use sof funds must be considered. The point can be put formally (see Kneller, Bleaney, Gemell, 1999, pp. 174-175 and Bleaney, Gemell, Kneller, 2001, pp.39-40).

The rate of growth of real GDP, g_t in country i at time t is a function of control variables, Y_{it} , and a vector of fiscal variables, X_{jt} :

$$g_{it} = \alpha \sum_{i=1}^{k} \beta_i Y_{it} + \sum_{j=1}^{m} \delta_j X_{jt} + u_{it} \qquad (1)$$

Assuming that all elements of the budget (including the budget balance) are included, so that

$$\sum_{j=1}^{m} X_{jt} = 0$$

One element of X must be omitted in the estimation of equation (1) in order to avoid perfect collinearity. The omitted variable is effectively the assumed compensating element within the government´s budget constraint.[1] Thus, if we rewrite equation (1) as:

$$g_{it} = \alpha + \sum_{i=1}^{k} \beta_i Y_{it} + \sum_{i=1}^{m-1} \delta_j X_{jt} + \delta_m X_{mt} + u_{it} \qquad (2)$$

and then omit X_{mt} to avoid multicollinearity, the identity $\sum_{j=1}^{m} X_{jt} = 0$ implies that the equation actually being estimated is :

1 The authors try to discriminate between the neoclassical growth model (Solow) and endogenous growth models (Barro, Lucas) by analysing the impact of various sub-divisions of expenditures (productive and nonproductive) and taxes (distortionary, nondistortionary) on economic growth.

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$$g_{it} = \alpha + \sum_{i=1}^{k} \beta_i Y_{it} + \sum_{j=1}^{m=1} (\delta_j - \delta_m) X_{jt} + u_{it} \quad (3)$$

The standard hypothesis test of a zero coefficient of X_{jt} is in fact testing the null hypothesis that $(\delta_j - \delta_m) = 0$ rather than $\delta_j = 0$. It follows that the correct interpretation of the coefficient on each fiscal item is as the effect of a unit change in the relevant item offset by a unit change in the omitted category (see Equation 3), which is the implicit financing element. In this way not only WSE are estimated but also their financing is taken into account. If the category chosen to be omitted is altered, the estimated coefficients of the included items will change.

a) current-period effects

Our regression analysis (Equation 3) uses two control variables[2] – private investment as a ratio to GDP in current prices and labour force growth (other possibilities see the literature review). Taxes are simply disaggregated into distortionary (direct taxes plus social security contributions received), indirect taxes (taxes linked to imports and production) and other taxes and fees (the difference between total revenue and two enumerated kinds of taxes). On the other side of the budget, on the expenditure side, total expenditure is composed of WSE and other expenditure.

Table7
Current-Period Effects (EU-25)

Estimation technique:	OLS	Fixed effects	Random effects
Dependent variable: GDP growth rate			
Omitted fiscal variable: distortionary taxes			
private investment	0.039 (8.47)	0.056 (1.18)	0.06 (1.40)
labour force growth	0.039 (0.44)	0.065 (0.79)	0.09 (0.95)
indirect taxes	0.432 (5.53)	-0.017 (-0.15)	0.20 (1.81)
other taxes and fees	0.269 (2.90)	- 0.159 (-1.11)	0.22 (1.85)
welfare state expenditure	-0.233 (-8.17)	-0.106 (-1.32)	-0.28 (-6.96)
other expenditure	-0.081 (-1.46)	0.097 (1.17)	- 0.13 (-1.86)
public balance	0.129 (2.35)	0.265 (3.41)	0.13 (1.99)
$\mathbf{R^2_{adj}}$	0.36	0.64	0.26

Note: Number of observations 289. Figures in parenthesis are t-statistics. Both redundant fixed effects test and Hausman test prefer fixed effects with P=0.00.

2 The number of control variables could of course be increased by adding other items but the impact of different controls is not in the centre of our research. We prefer using private investment to avoid collinearity with government expenditure. All variables in this paper are from Eurostat ´s AMECO and COFOG datasets.

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First of all we examine current-period effects neglecting the time lags between WSE and the GDP growth rate.

As the implicit financing element we use distortionary taxes, but the use of remaining taxes does not lead to different results *vis-à-vis* WSE. The signs of variables are consistent with theory, but mainly statistically insignificant especially in the column devoted to fixed effects.

The public balance has a large and statistically significant coefficients in all three cases (a notable feature of the previous research in this field).

b) lagged effects

According to theory the relationship of fiscal variables to growth is dynamic by nature and the dynamics can therefore not be omitted. In what follows we regress two-year, three-year, four-year and five-year forward looking moving average of GDP growth on yearly expressed tax and expenditure variables to capture the dynamics and to refrain from endogeneity.

Table 8
Lagged Effects

Estimation technique: Pooled EGLS (cross-section weights)								
Dependent variable: 2-3- 4-and 5year forward moving average of the GDP growth rate								
Omitted variable:	**distortionary taxes**				**welfare state expenditure**			
	a	**b**	**c**	**d**	**e**	**f**	**g**	**h**
private investment	0.1867	0.1565	0.1788	0.1717	0.1872	0.1587	0.1833	0.1788
	(5.34)	(4.96)	(6.51)	(5.42)	(5.30)	(4.95)	(6.65)	(5.64)
labour force growth	0.01	0.1348	0.1555	0.0753	0.0159	0.1412	0.1525	0.0633
	(0.21)	(3.23)	(3.65)	(1.56)	(0.32)	(3.35)	(3.56)	(1.30)
distortionary taxes	-----	------	------	------	-0.1479	-0.1644	-0.1829	-0.2449
	(-2.16)	(-2.60)	(-3.58)	(-4.59)				
indirect taxes	-0.1620	-0.2324	-0.3308	-0.3364	-0.3132	-0.4053	-0.5136	-0.5803
	(-1.90)	(-2.62)	(-4.02)	(-3.87)	(-3.16)	(-3.96)	(-5.69)	(-6.15)
other taxes and fees	-0.1946	-0.2157	-0.1364	-0.0062	-0.3293	-0.3694	-0.2989	-0.2059
	(-1.78)	(-2.36)	(-1.98)	(-0.10)	(-3.09)	(-4.10)	(-4.20)	(-3.18)
welfare state exp.	-0.1834	-0.2030	-0.2030	-0.2451	-------	-------	-------	--------
	(-3.79)	(-3.30)	(-4.07)	(-4.85)	-------	-------	-------	--------
other expenditure	0.1111	0.1661	0.1788	0.050	0.2679	0.3390	0.3614	0.2867
	(1.80)	(3.12)	(3.89)	(1.12)	(3.87)	(5.20)	(6.63)	(5.51)
public balance	0.2735	0.2635	0.2040	0.058	0.4405	0.4469	0.3969	0.3021
	(4.60)	(5.07)	(4.70)	(1.41)	(8.82)	(9.98)	(10.78)	(8.34)
R^2_{adj}	0.81	0.87	0.92	0.90	0.81	0.87	0.92	0.90

Note: ad a) and ad e) 2-year forward moving average (270 observations); ad b) and ad f) 3-year forward moving average (251 observations); ad c) and ad g) 4-year forward moving average (232 observations); ad d) and ad h) 5-year forward moving average (213 observations). t-statistics in parentheses.

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Some authors, *e.g.* Devarajan *et al*., (1996), Kneller *et al.* (1999) and Folster, Henrekson (2001) use averages over the five-year period to eliminate short-term fluctuations. Kneller *et al*. test the robustness by shifting the 5-year periods. Bleaney *et al*. (2001) allow the data to determine the appropriate number of lags (more than five years).

The forward lags in our investigation is chosen to reflect the fact that public expenditures often take time before their effects on the economic growth can be registered. To enable comparison of both current-period and lagged effects we have not changed in Table 8 the omitted variable as the implicit financing element and add another omitted variable WSE but lagged the dependent variable by using forward moving average of the GDP growth rate.

The signs of variables, when we omit distortionary taxes, are consistent with theory and are mainly statistically significant. In columns a, b, c, d estimated coefficients represent the effect of an increase in a given fiscal variable that arises from an offsetting change in distortionary taxes. The coefficient of WSE says that an increase by one percentage point decreases the GDP growth rate by 0.20 percentage points. These results appear to be robust across different time lags. The other expenditure (the remaining 6 items of COFOG classification) has expected positive sign, partially statistically significant.

From the table we can calculate also the net impacts (Helms, 1985) as the algebraic sum of the tax and expenditure coefficients. *E.g.* when WSE is the omitted variable we can calculate the net effect of other expenditure financed by distortionary taxes. The net effect on the growth rate of GDP is positive in columns e (0.12), f (0.1746), g (0.1785), and h (0.0418). But when other expenditure is financed by indirect taxes the net effect is negative.

The explanatory power of the equations is relatively high, judging by the values of the adjusted coefficient of determination. This is mainly due to the homogenity of the EU countries in the pool.

The partial conclusion which can be drawn is that lagged effects are more negative *vis-à-vis* economic growth than current-period effects. This result is not at variance with mainstream theory. Last, but not least, disentangling WSE, we obtain Table 9.

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Table 9
Lagged Effects - Desintangling WSE

Estimation technique: Pooled EGLS (cross-section weights)				
Dependent variable: 2-, 3-, 4- and 5 year forward moving average of the GDP growth rate				
Omitted variable: distortionary taxes				
	a	**b**	**c**	**d**
private investment	0.1662	0.1621	0.1669	0.1667
	(5.22)	(5.04)	(5.81)	(5.11)
labour force growth	-0.0058	0.0990	0.1137	0.0462
	(-0.12)	(2.36)	(2.72)	(0.99)
indirect taxes	-0.1770	-0.2163	-0.2610	-0.2323
	(-2.29)	(-2.67)	(-3.49)	(-2.70)
other taxes and fees	-0.1903	-0.2369	-0.1587	-0.0414
	(-1.88)	(-2.81)	(-2.42)	(-0.63)
social protection	-0.3685	-0.4519	-0.4305	-0.4456
	(-4.69)	(-6.55)	(-7.64)	(-7.39)
education	0.1701	0.3580	0.3628	0.2610
	(0.86)	(2.37)	(2.66)	(1.67)
health	-0.0926	-0.1316	-0.2320	-0.2111
	(-0.87)	(-1.26)	(-2.51)	(-2.00)
other expenditure	0.1105	0.1658	0.1460	0.0680
	(1.75)	(3.09)	(3.27)	(1.44)
public balance	0.2667	0.2561	0.1987	0.0842
	(4.90)	(5.63)	(5.15)	(1.95)
R^2_{adj}	0.83	0.89	0.92	0.92

Note: t-statistics in parenthesis.

Looking at the table we see the high negative coefficients for the main item of WSE – social protection. The coefficients are very high and statistically significant in all lagged regressions displaying the robustness of the conclusion: The fiscal variable – social protection financed by distortionary taxes (the implicit financing element) is the most important factor negatively influencing the rate of growth of GDP (at least in our sample). Education has a positive sign improving therefore economic growth, whereas health exhibits a negative, mainly insignicative, sign.

6. Conclusions and Caveats

The descriptive analysis of WSE shows that since 1995 (the starting point of our regressions) their ratio to GDP has been decreasing till 2007 with a sharp increase in 2008. The partial approach – simple correlations with means values (WSE for 2002-6 and the subsequent growth rate of GDP for 2006-8) figures the negative association. Negative correlation is smaller for old EU countries (EU-15) and higher

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for post-socialist EU countries (EU-10). Among the EU-10 a closer look reveals the higher differences between the mean values of WSE and GDP growth rate for the "peripheral" than for "central" countries.

Following the original article of Helms (1985) to sort out the countervailing effects of expenditure and taxes one must explicitly recognize the government budget constraint. In analysing current-period effects both redundant fixed effects test and Hausman test prefer fixed effects which we apply in this paper. As the implicit financing element (omitted variable) we use distortionary taxes, but the use of remaining tax items does not lead to different results *vis-à-vis* WSE. The signs of variables are consistent with theory, but mainly statistically insignificant.

According to theory the relationship of fiscal variables to growth is dynamic by nature and the dynamics can therefore not be omitted. We regress 2-year, 3-year, 4-year and 5-year forward looking moving average of GDP growth on yearly expressed tax and expenditure variables to capture the dynamics and to restrain from endogeneity. Omitted variables are both distortionary taxes and WSE. The coefficient of WSE says that an increase by one percentage point decreases GDP growth rate by 0.20 percentage points when we omit distortionary taxes. These results appear to be robust across different time lags. The other expenditure (the remaining 6 items of COFOG classification) has expected positive sign, partially statistically significant. We calculate the net impacts as the algebraic sum of the tax and expenditure coefficients. When WSE is the omitted variable we can calculate, *e.g.,* the net effect of other expenditure financed by distortionary taxes. The net effect on the growth rate is positive for all lags. But when other expenditure is financed by indirect taxes the net effect is negative. Lagged effects of fiscal items are more negative *vis-a-vis* economic growth than current-period effects.

The main conclusion is that WSE reduces growth whereas other expenditure supports growth. All tax items (distortionary, indirect and other taxes and fees) have negative impacts on economic growth.

Theoretically there are several channels through which government expenditure can impact economic growth. The composition, efficiency and effectiveness of expenditure is one of the five dimensions of the quality of public finance. A set of indicators has been identified for each of the five dimensions. Composite indicators (Public Finances in EMU, 2009) try to measure (as benchmarks the authors used the unweighted EU-15 average) the quality of public finance.

Tables in Public Finances in EMU, 2009 show the positions of Member States. As concerns composite indicators the tables (pp. 77, 78) reveal (data from 2007) that no country outperformed in all dimensions, but some countries showed weaknesses in a number of areas. The post-socialist, recently acceded EU members get high scores in the composition of expenditure (the majority of them over the EU average), however, this is not yet fully reflected in outcomes (especially health).

Government expenditure analysed in our paper does not yet mean the efficiency in spending. Assessing efficiency can serve as a benchmark to guide expenditure rationalization by focusing cuts in relatively inefficient areas of spending.

According to some authors (*e.g.* Afonso, Schuknecht, Tanzi, 2006) countries with lean public sectors and public expenditure ratios not far from 30 percent of GDP tend to be most efficient. They stress that calls to allocate a given, or a larger share of

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national budgets to health and education assume the identity between expenditure and benefits, but the two can be widely different and this difference is central to the concept of efficiency. The same conclusion has been drawn in a newer paper of these authors (2006) applying public sector performance (PSP) and public sector efficiency (PSE) scores.

The message is clear: especially post-socialist new EU Member States can considerably increase the efficiency of government expenditure on the welfare state by improving the outcomes and restraining the spending taking into account a negative association between this kind of expenditure and economic growth.

Appendix

Definition of Initial Variables

GDP at current market prices, national currency	UVGD	Ameco
GDP at constant (2000) market prices (rate of growth)	OVGD	Ameco
Gross fixed capital formation at current prices; private sector (ratio to GDP at current prices)	UIGP	Ameco
Total labour force (rate of growths)	NLTN	Ameco
Current taxes on income and wealth (direct taxes); general government	UTYG	Ameco
Taxes linked to imports and production (indirect taxes); general government	UTVG	Ameco
Actual social contributions received; general government	UTAG	Ameco
Total revenue; general government	URTG	Ameco
Total expenditure; general government	UUTG	Ameco
Net lending (+) or net borrowing (-); general government	UBLG	Ameco
Social protection	GF.10	COFOG
Health	GF.07	COFOG
Education	GF.09	COFOG
Housing and community amenities	GF.06	COFOG

Data source: European Commission (EUROSTAT). All fiscal variables are ratios to GDP.

Definition of Derived Variables

Distortionary taxes = direct taxes + actual social contribution received
Other taxes and fees = total revenue – (distortionary taxes + indirect taxes)
Welfare state expenditure = social protection + health + education + housing and com. amenities
Other expenditure = total expenditure – welfare state expenditure

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