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The Scope of Government and Its Impact on Economic Growth in OECD Countries

by

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on Economic Growth in OECD Countries

Abstract:

This paper investigates the relationship between the size of government and economic growth in OECD countries in 1960–2000. The underlying idea is that government expenditures on public goods basically have a positive effect on growth, but this growth effect tends to decline or even reverse when government is overdoing, e.g. by increasing expenditures in such a way that it ultimately also provides private goods. Empirical analyses based on panel estimates for 21 OECD countries support this hypothesis: Total government expenditures as well as expenditures by type indicate a significant negative impact on economic growth (excepting transfers and public investments).

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1. Introduction

The OECD countries after WWII could achieve enormous improvements in living standards. The rapid rise in economic wealth went hand in hand with substantial improvements in economic freedom: Tariff reductions and removals of non-tariff barriers have increased the international trade in goods and services; getting rid of restrictions on capital movements as well as improvements in the system of exchange rates have increased the international flows of capital, including direct investments. Better and more efficient monetary policies have reduced the adverse impacts of inflation and contributed to the freedom of internal exchange.

In contrast to these positive developments there is an important part of economic life which seems to have suffered from reductions in economic freedom: The scope of government and the related level of overall taxation during the last decades has been steadily increasing – especially in Europe where some countries show up shares of government well above 50 per cent. Lindbeck (1997) argued that Sweden's economic development deteriorated with the increase of the scope of government. Studies of the decline of the former centrally planned economies showed that the ongoing repression of private economic activity was accompanied by steadily declining rates of economic growth (Bergson 1987). Thus, there is the question whether a constant or perhaps even declining share of government would have led (or will lead) to a still further improvement of wealth in OECD countries.

The present study investigates the relationship between the scope of government and economic development in OECD countries over the last four decades. In the next section a conceptual framework of the basic welfare/efficiency relationships

is presented which depicts the possible interactions between the key variables involved. Section 3 contains data on the scope of government in OECD countries which is then (Section 4) compared with government expenditures on core public goods. To evaluate the possible growth effects of government expenditures a standard model of economic growth without government activities (which will serve as a reference system) is outlined and empirically tested (Section 5). In Section 6 this model is augmented to include government activities. Evidence for crowding out is presented in Section 7. Conclusions are drawn in the last section.

2. Theoretical Relationships between Government Expenditures and Economic Output

The central hypothesis is that government expenditures on core public goods (such as on the rule of law, internal and external security, etc.) have a positive impact on economic growth. However, as is also suggested, this positive impact of government tends to decline or even reverse if government further increases expenditures in such a way that it ultimately also provides private goods. An excess amount of public expenditures then has a negative impact on economic growth and employment for several reasons, one being that the necessary taxes reduce the incentives to work, to invest and to innovate, and another reason being that government crowds out private suppliers and is less efficient than the suppliers which had been crowded out.

The positive-sum and negative-sum relationships between government expenditures (and taxes) and the output level of an economy can be shown graphically

(Figure 1).[1] At zero government shares (and tax rates) the level of output is very low because public goods are not adequately provided. As government shares (and tax rates) rise and the public services are provided economic activity of the country also increases (towards point B).

Figure 1 –   Hypothetical Output / Expenditure Relationships

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Government (Tax) Share
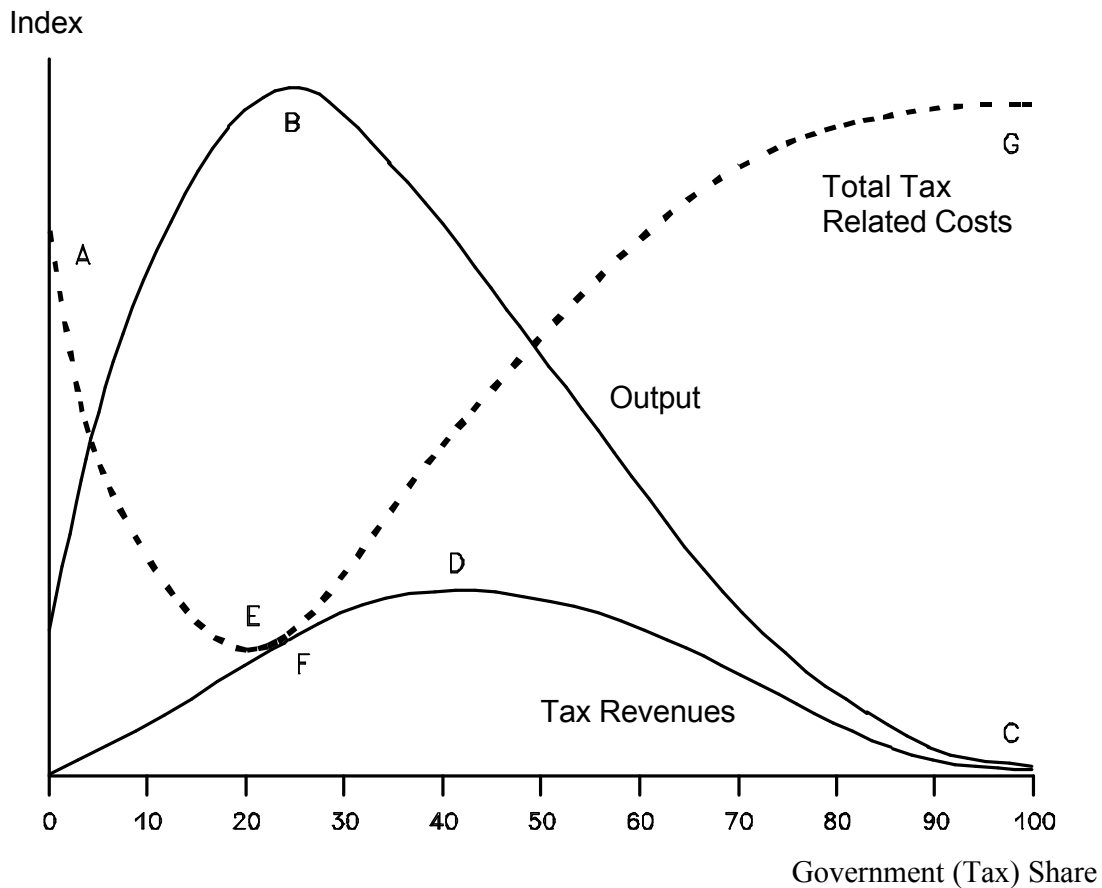
Source: Mc Mullan (1978).

With further rising government expenditures (and tax rates), the government may go beyond the point of only supplying public goods and also begin to provide private goods. As this process continues there will be a peak in the output level (point B) and with further rises in government expenditures (and tax rates) the

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[1]   This analysis follows McMullen (1978).

economy's output level will decline. Because of decreasing returns of government expenditures and rising tax rates the incentives to work, to invest and to innovate will steadily decline.

The point where the output level peaks as well as the shape of the expenditure/output curve depends on a number of factors which are different from country to country and whose importance may change in the course of time. In this respect the type of an additional government expenditure seems to be important. E.g. if the country provides public goods by a highly bureaucratic and inefficient apparatus of state the contribution to output will accordingly be small. The same seems to be true if government provides subsidies to less competitive industries or if the general share of transfer payments is high. In addition, if the share of interest payments to serve public debts is high, the contribution to economic efficiency will be small. In contrast, the higher the share of public investment, the higher the level of output.

Although the location of the output maximum as well as the shape of the expenditure/output curve vary between countries it seems to be valid that with corresponding high government shares (and tax rates) there will be always be a point which will cause factors of production to withdraw from the production process (point B). From this point on the reduction in the supply of productive factors has an increasingly negative effect on productive capacity.

The level of government expenditures (taxes) – with the respective government share (tax rate) – is given by the curve 0FDC. Government expenditures (tax revenues) reach their maximum in D. The corresponding government share (tax rate) is always higher than in point B.

Total government related costs consist of the output taxed away and of output losses due to inefficiencies; they are represented by the curve AEFG which reflects the difference between maximum production (point B) and actual after-tax incomes. At low taxes rates these government related costs are high because the supply of public goods is insufficient. As tax rates rise and the supply of public goods increases, economic efficiency improves and government related costs decrease. Government related costs then reach a minimum (point E) before output peaks.

The extreme points of the expenditure/tax schedule may be identified with anarchy (at very low tax rates) and totalitarism at the upper end (McMullen, 1978). The optimum government share (tax rate) lies in between. With respect to its location people will disagree. Those groups of the society that benefit from taxation and transfer payments will probably vote for point D where tax revenues are maximised. In contrast, those who do not gain from taxation and transfer payments will probably prefer point E where government related costs are minimised.

These welfare/efficiency relationships are hypothetical, because it is uncertain what government share (tax rate) will maximise a country's total output (point B), maximise tax revenues (point D) or minimise total government related cost (point E). The above mentioned high government shares lend support to the hypothesis that e.g. the European countries are located beyond point B today. In the next sections it will be analysed whether there is empirical evidence in favour of these hypothetical relationships between government shares (taxes) and economic development.

3.   The Scope of Government

To measure the scope of government activities it is common to estimate the share of government expenditures in gross domestic product. This share is assumed to characterise the extent to which domestic resources are utilised by the government sector. This procedure has the advantage to express the scope of government in one single index number. However, there are at least two reservations. Government shares only include those government activities which result in financial flows in government accounts. Thus, private expenditures which are induced by government regulations (e.g. environment regulation etc.) are not included. Secondly, the institutional distinction between government and the private sector is shaky because government enterprises which finance their supply of goods and services through ordinary sales are not classified as being part of the government sector. Thus, government shares are likely to underestimate the true scope of government.

The data on the scope of government in OECD countries since 1960 is given in Table 1. Since the aim of this paper is to investigate long-term growth effects, i.e. refrains from analysing short-term cyclical developments in gross domestic product, these data are given as ten-year averages. As can be seen, the scope of government in the course of time rose substantially. In the 60s less than 30 per cent of gross domestic product were devoted to government activities. In the 90s the average government share, and broadly speaking the tax rate (if one abstracts from borrowing), rose to about 46 per cent. Thus, the utilisation of domestic resources by the government sector was considerably extended.

The data also show that the scope of government differed widely. Japan in the 60s had a government share of only 19 per cent and also in the following decades

this share remained distinctly below the OECD average. The same seems to be true for the United States. In the 60s the share of government was about the average value for OECD countries. Until the 90s the government sector only rose to about 36 per cent of GDP. In contrast, in Northern Europe the growth of government was comparably fast. Sweden and Denmark in the 90s even surpassed the 60 per cent margin.

Table 1 – The Scope of Government[a] in OECD Countries, 60s, 70s, 80s and 90s

Country	60s	70s	80s	90s[b]
Austria	38.5	44.4	50.5	53.3[c]
Belgium	37.8	50.1	58.8	53.9
Denmark	32.1	47.9	59.3	61.8[d]
Finland	30.2	36.7	44.2	59.6[c]
France	38.3	42.1	50.6	53.7
Germany	37.0	45.6	47.6	50.5
Greece	20.8	26.4	42.2	50.8[d]
Iceland	28.5	33.6	37.2	40.4[c]
Ireland	33.4	43.7	49.4	40.3[c]
Italy	32.8	41.3	50.3	54.4[c]
Luxembourg	33.7	45.4	54.0[e]	.
Netherlands	39.2	51.8	61.0	57.1[c]
Norway	35.2	46.0	47.2	50.2
Portugal	20.4	28.9	42.1	44.1[d]
Spain	20.6[f]	26.4	40.1	46.1[c]
Sweden	37.7	52.4	62.8	67.7[c]
Switzerland	19.7	25.8	29.5	33.0[c]
United Kingdom	36.4	42.9	44.6	44.5[c]
Canada	32.3	40.0	47.2	50.2
United States	28.9	31.9	35.7	36.1
Japan	19.0	26.9	32.6	34.5
Australia	23.9	31.7	36.9	38.4[c]
Mean	29.4	37.5	44.5	46.3

[a] Average total government outlays as per cent of gross domestic product. — [b] 1991–1997. — [c] 1991–1996. — [d] 1991–1995. — [e] 1981–1986. — [f] 1964–1970.

Source: OECD (var. iss.). — Own calculations.

4. Expenditures on Core Public Goods

To get an impression whether and to what extent the share of government in OECD countries is oversized one can also evaluate the share of government expenditures on core public goods, i.e. on those goods which refer to the basic functions of government.[2] According to Adam Smith ([1776] 1976: 208–209) the proper role of government consists of only three duties: (1) the defence of the country, (2) the administration of justice, and (3) the maintenance of certain public works and certain public institutions. With respect to the third duty Adam Smith ascribed a rather limited role to government because he explicitly refers to only those public works or public institutions which „...can never be for the interest of any individual, or small number of individuals, to erect and maintain; because the profit could never repay the expense to any individual or small number of individuals, though it may frequently do much more than repay it to a great society.[3] Compared with this judgement the assessment of Milton Friedman (1990) seems to be even more restrictive since his aim is to „...limit government while enabling it to perform its essential functions of defending the nation from foreign enemies, protecting each of us from coercion by our fellow citizens, adjudicating our disputes, and enabling us to agree on the roles that we shall follow."[4]

Obviously there is some room for discussion concerning the proper functions of government and some may have reservations against a very strictly limited role of government. Thus, the following measurement of core public expenditures

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[2] Gwartney et al. (1998).

[3] Adam Smith ([1776] 1976: 209).

[4] Milton Friedman (1990: 7).

uses a rather „generous" delimitation. The core expenditure categories consist of (a) public order and safety, (b) national defence, (c) education and (d) transportation and communication.[5] Especially the expenditure categories (c) and (d) in the strict sense do not exhibit the character of pure public goods because the private sector seems also to be capable to successfully provide these goods.

The share of government expenditures in the so defined core categories as a percentage of gross domestic product is given in Figure 2. Although there is

Figure 2– Core Government Expenditures[a] in OECD Countries, 1995
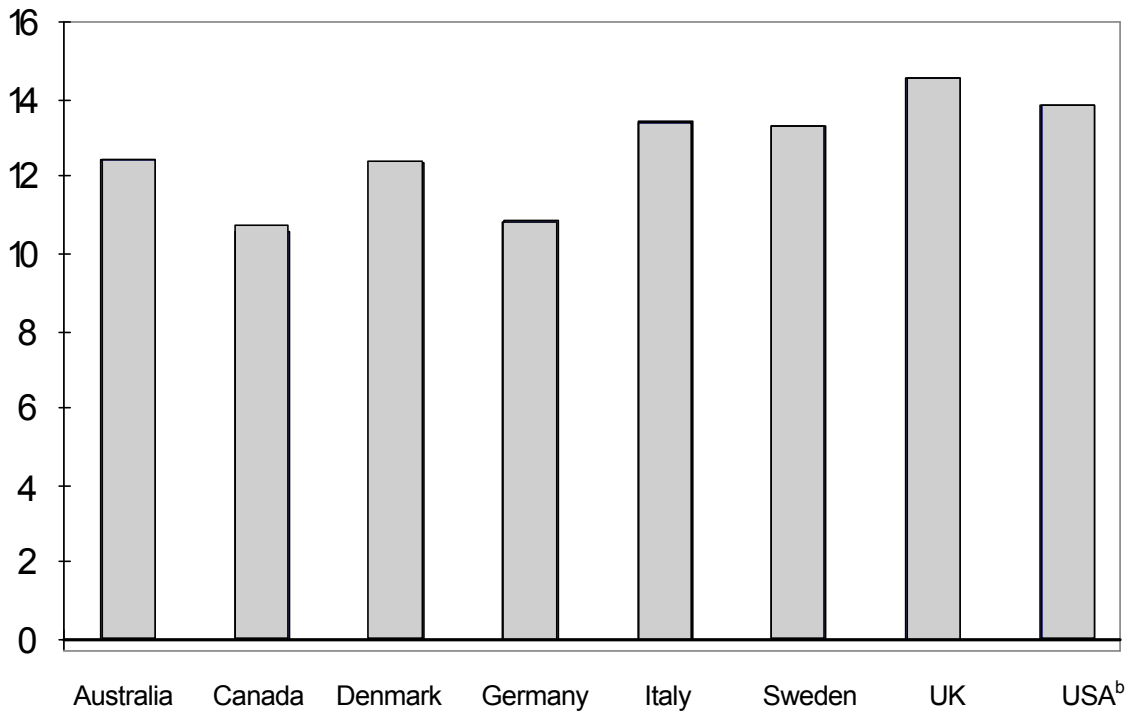
[a] Core Government expenditures consist of expenditures on public order and safety, national defence, education and transportation/communication and are measured as a share of gross domestic product.— Data for Canada, Sweden and the United States are taken from Gwartney et al. (1998).—[b] 1992.

Source: OECD (var.iss.) — Own calculations.

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[5] Some would add the expenditures on the central banking system, sanitation, and environment protection. But since statistics on these expenditures are not available for all countries these categories have not been included. In the United States and Canada expenditures in these categories account for approximately 1 per cent of gross domestic product. See also Gwartney et al. (1998:167–168).

some variation in these shares in the countries investigated the general message is that the expenditure share in these core categories is about (or below) 14 per cent of gross domestic product. Even countries like Sweden – where the scope of government is relatively large – do not show up a different share.

From the above analysis one might suggest that the scope of government in today's OECD countries is well above the „optimum" level of government acti-vity referred to in Figure 1 with all the implied consequences for economic development. Whether and to what extent such consequences indeed have come into force will be investigated in the next sections. To do so, first of all the basic characteristics of a simple model of economic growth without explicit govern-ment activities is outlined and estimated first in order to have a reference system for the further analysis of the scope of government on economic activity.

5. Determinants of Economic Growth without Government Activities

To evaluate the contribution of the more traditional determinants of economic growth it is common practice to refer to such determinants as the accumulation of physical capital, the growth of the labour force, human capital accumulation and technical progress. To estimate their respective contributions to economic growth one may draw upon an augmented neoclassical model of economic growth. The starting point is the neoclassical approach by Solow (1956) as specified by Mankiw et al. (1991), i.e. a human capital augmented approach.[6] One of the main characteristics of this model is that the *steady state* level of per

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[6] The augmented neoclassical model of economic growth is also discribed in detail in Heitger (1998: 16–24).

capita income depends on the accumulation of physical and human capital and the growth of the labour force which means that the rate of economic growth during the relative long period of transitional transformation is also dependent on these determinants (but not in the final *steady state*).[7]

To estimate this model for OECD countries long-run data on economic growth, the accumulation of physical capital, the growth rate of the labour force, human capital accumulation and initial income were compiled. To abstract from short-run cyclical business fluctuations, the empirical test is based on ten-years averages of the respective variables. Only initial income refers to the beginning of the respective decade.[8] The data sample covers the 60s, 70s, 80s and 90s.

Economic growth was calculated as the growth rate of gross domestic product per member of the labour force. The calculations show that economic growth in the course of time slowed down considerably (Table 2). In the 60s the average growth rate in OECD countries was 4 per cent. In the 70s this rate halved and then further reduced to 1.7 per cent and 1.5 per cent in the 80s and 90s respectively.

The data on the exogenous variables of the model are given in the Appendix (Tables A1–A4). Physical capital accumulation, measured as the share of capital formation in gross domestic product over time, was also considerably reduced: The share fell from about 28 per cent in the 60s to about 23 per cent in 90s. The

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[7] Thus, this augmented neoclassic model exhibits characteristics similiar to those of endogenous growth models.

[8] Due to the availability of improved data on education the measure of human capital also refers to begin of period.

Table 2 – Economic Growth[a] in OECD Countries, 60s, 70s, 80s and 90s

Country	60s	70s	80s	90s[b]
Austria	5.17	2.67	1.30	0.73
Belgium	4.41	2.21	1.34	1.51
Denmark	3.02	0.70	1.51	2.46
Finland	3.83	2.49	2.27	2.41
France	4.72	2.16	1.24	1.00
Germany	4.23	2.49	0.79	1.71
Greece	7.48	3.54	1.33	0.48
Iceland	2.16	3.63	1.06	–0.29
Ireland	4.52	3.36	2.66	3.71
Italy	5.59	3.27	1.37	1.08
Luxembourg	3.03	1.13	2.87	1.79
Netherlands	3.95	1.40	0.66	1.20
Norway	3.06	2.64	1.46	3.01
Portugal	5.51	2.96	3.85	2.02
Spain	7.04	2.59	2.06	1.80
Sweden	2.92	0.68	1.33	2.42
Switzerland	3.01	0.82	1.05	0.46
United Kingdom	2.29	1.35	2.31	1.44
Canada	2.46	1.43	1.80	0.67
United States	2.21	0.40	1.48	1.24
Japan	8.36	3.46	3.29	1.63
Australia	2.69	0.78	1.06	1.76
New Zealand	1.25	0.21	0.32	0.50
Mean	4.04	2.02	1.67	1.51

[a] Average yearly growth rate of gross domestic product per capita (worker) measured in international prices of 1985.— [b] 1991–1997.

Source: National Bureau of Economic Research (1997). — OECD (var. iss.). — Own calculations.

growth rate of the labour force in the 70s and 80s rose to 1.2 per cent but it the 90s fell back to about 0.8 per cent. In the classical immigration countries the growth rate of labour in all decades was well above OECD average. Human capital formation, as in numerous other empirical studies, was proxied by specific school enrolment rates. In the present investigation a recently revised data set on secondary school enrolment rates is used.[9] The data show that human capital accumulation rose with a rather constant rate from about 36 per cent in

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[9] De la Funte and Donénech (2000).

the 60s to about 53 per cent in the 90s. Finally, the development of initial income was measured as relative income per worker with respect to the United States (the technological leader and country with the highest per capita income). The development of this variable reveals that the average income gap in the course of time was considerably reduced.

With the help of this data set it is possible to test the augmented neoclassical growth model. The regression technique used is the standardised random effects generalised least squares procedure, which is essentially ordinary least squares corrected for the fact that the four successive observations for each country cannot be treated as strictly independent random draws. It is assumed that the growth rate of gross domestic product per worker in OECD countries is a function of physical capital formation, the growth rate of the labour force, human capital formation and initial relative per capita income. The regression results (Table 3, Equation 1) support these hypotheses. The coefficients indicate that, given the growth rate of the labour force, the rate of economic growth is the faster the higher the accumulation of physical capital is. Given physical capital accumulation, economic growth is the slower the faster the rate of growth of the labour force is. These relationships are in line with the basic assumptions of the neoclassical growth theory. The inclusion of human capital accumulation reveals – with respect to the underlying OECD country sample – no additional contribution to the determination of economic growth, since the regression coefficient of this variable has the correct sign but is not statistically significant. In addition, the regression equation indicates that economic growth was the faster the lower the initial relative income was.

Table 3 – Determinants of Economic Growth in OECD Countries,
60s, 70s, 80s and 90s

Equation[a]	(1)	(2)	(3)	(4)	(5)
Exogenous Variables					
Constant	−0.513 (−0.21)	7.517 (2.06*)	10.588 (2.83**)	10.850 (3.91**)	11.886 (4.47**)
ln INVSH	1.306 (2.17*)	0.659 (1.11)	0.246 (0.41)	.	.
ln GROLAB	−1.680 (−2.04*)	−2.089 (−2.59*)	−2.364 (−2.98**)	−2.149 (−2.65**)	−2.397 (−3.03**)
ln HUMCAP	0.037 (0.14)	0.167 (0.71)	0.169 (0.73)	0.266 (1.06)	0.221 (0.92)
ln RGDPW	−3.455 (−7.15**)	−2.781 (−6.18**)	−2.544 (−5.52**)	−2.974 (−6.16**)	−2.650 (−5.50**)
ln OUTL	.	−1.455 (−3.03**)	.	−1.878 (−4.12**)	.
ln DISB	.	.	−1.820 (−3.88**)	.	−2.010 (−4.81**)
Adjusted R²	0.66	0.67	0.70	0.71	0.72
Standard Error of the Regression	0.95	0.92	0.88	0.87	0.85
No of observations	84	80	80	80	80

[a] Generalised least squares estimates using four time periods (60s, 70s, 80s and 90s). t-test in parentheses. *significant at 5 per cent, **at 1 per cent. — Dependent variable is average growth rate of gross domestic product per capita (worker). — INVSH, average share of investment as per cent of gross domestic product. — GROLAB, average yearly growth rate of the labour force (5 percentage points added to account for technical progress (3 per cent) and depreciation (2 per cent). — HUMCAP, human capital proxied by secondary school enrolment rates. — RGDPW, gross domestic product per worker relative to the United States. — OUTL, average total government outlays as per cent of gross domestic product. — DISB, average disbursements as per cent of gross domestic product.

Source: Tables 1 and 2, Tables A1–A4. — Own calculations.

6. The Impact of Government Expenditures on Economic Growth

In this section the model of economic growth is extended to include the effects of government expenditures. It is assumed that government expenditures act through the efficiency parameter of the augmented neoclassical growth model.

Thus, government expenditures are assumed to be an additional determinant of economic growth.

Given the fact that the supply of core public goods in the 90s only accounted for about (or below) 14 percentage points of gross domestic product and given the observation that the total scope of government in many OECD countries amounted up to a share of about 50 per cent, one may suggest that these countries have surpassed the „optimum" level of government activities considerably. Thus, a negative relationship between government expenditures and economic growth is expected.

The respective regression equations are also presented in Table 3. Government expenditures are included as an additional exogenous variable in the growth equation (Equation 2). The relationship between government expenditures and economic growth is negative and statistically highly significant: The larger the scope of government in OECD countries was the more pronounced was the decline in economic growth.

The coefficient of determination of the regression equation only rises slightly. The reason is, that with the inclusion of government expenditures the coefficient of physical capital accumulation has lost its significance. This may be interpreted as a first indication that government expenditures have also crowded out investment.[10]

As mentioned above, with respect to economic growth the structure of government expenditures seems to be of additional importance. The data of specific

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[10] This issue will be investigated in more detail in the next section. – If the scope of government is measured by disbursements, i.e. total consumptive expenditures, the respective growth effects are even more pronounced.

government shares with respect to different types of government expenditures are given in the Appendix (Tables A5– A9). From an economic point of view these expenditures can be divided into two broad categories: government consumption goods and government investment goods. The consumption goods (disbursements, DISB) comprise final consumption expenditures (FCE), transfers (TRA) as well as interest payments and subsidies (INTSUB). The investment goods are not further divided into subgroups but only consist of public investments (PUBLINV). Again it is evident that the regional structure as well as the development of these government activities according to type differs widely.

Since government expenditures of different types may have different effects on economic growth, additional regressions with different types of expenditures have been run.[11] The regression results indicate that all subcategories of consumptive government expenditures have a significantly negative impact on economic growth (Table 4, Equations 1–3). In the case of public capital formation one might have expected a positive effect on economic growth. But in this case too, the sign of the regression coefficient is negative although not statistically significant (Equation 4). Taken together, there is no type of government expenditures which seems to have been positively related to economic activity. On the contrary, the growth effect of nearly all subcategories of government expenditures in OECD countries seems to be negative.

Table 4 – Determinants of Economic Growth in OECD Countries Including Specific Types of Government Expenditures, 60s, 70s, 80s and 90s

Equation	(1)	(2)	(3)	(4)

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[11] A regression in which all subcategories of government expenditures served as exogenous variables led to unsatisfactory results, i.e. revealed problems of multicollinearity. The reason seems to be that the different types of government expenditures are highly correlated, i.e. show to a large extent the same variation in the data (see Table A10).

Exogenous Variables				
Constant	5.838	2.767	2.017	−0.615
	(1.59)	(0.95)	(0.82)	(−0.315)
ln INVSH	0.459	1.233	0.745	1.178[b]
	(0.82)	(2.26*)	(1.19)	(2.33*)
ln GROLAB	−1.917	−2.192	−1.566	−1.050
	(−2.32*)	(−2.52**)	(−2.035*)	(−1.32)
ln HUMCAP	0.175	0.056	0.128	0.034
	(0.61)	(0.25)	(0.56)	(0.16)
ln RGDPW	−3.284	−2.658	−3.128	−3.185
	(−6.12**)	(−5.690**)	(−7.53**)	(−7.401**)
ln FCE	−1.416	.	.	.
	(−2.30*)			
ln TRA	.	−0.700	.	.
		(−2.24*)		
ln INTSUB	.	.	−0.518	.
			(−2.81**)	
ln PUBLINV	.	.	.	−0.108
				(−0.34)
Adjusted R²	0.70	0.64	0.66	0.61
Standard Error of Regression	0.89	0.96	0.94	0.95
No of Observations	84	80	80	72

[a] Generalised least squares estimates using four time periods (60s, 70s, 80s and 90s). t-test in parentheses. *significant at 5 per cent, **at 1 per cent. — Dependent variable is average growth rate of gross domestic product per capita (worker). — INVSH, average share of investment as per cent of gross domestic product. — GROLAB, average yearly growth rate of the labour force (5 percentage points added to account for technical progress (3 per cent) and depreciation (2 per cent). — HUMCAP, human capital proxied by secondary school enrolment rates. — RGDPW, gross domestic product per worker relative to the United States. — FCE, average final consumption expenditures as per cent of gross domestic product. — TRA, transfers. — INTSUB, interest payments and subsidies. — PUBLINV, government gross fixed capital formation. — [b] Private sector.

Source: Table 1 and Tables A1–A4, A6–A9. — Own calculations.

7. Evidence for Crowding Out

The results obtained suggest that government activities not only did not improve but actually impaired economic efficiency. In addition, the regression results indicate that things could even be worse. Compared with the reference equation, i.e. the growth equation without government activities (Table 3, Equation 1), the inclusion of government expenditures or different types of government

expenditures makes the capital accumulation variable lose its significance. This holds true for most of the definitions of government activities: total government outlays, disbursements, final consumption expenditures and interest payments and subsidies. Quite obviously, government expenditures are also directly related to the formation of physical capital. The nature of this relationship will be investigated via the following empirical test.

In this test physical capital formation is the dependent variable whereas total government outlays as well as different types of government expenditures serve as independent variables. The results are shown in Table 5. In all equations there is a highly significant relationship between government expenditures and physical capital accumulation. With respect to total government outlays and all types of consumptive government expenditures this relationship is negative, whereas the relationship between public investment and physical capital formation is positive. In the case of total government outlays and disbursements the regressions „explain" about two thirds of the data variation of physical capital accumulation. Thus, the scope of government seems not only to have had a negative impact on economic efficiency (i.e. total factor productivity) but also through the „investment channel" on physical capital formation. Since this second impact seems to be quite strong and highly significant, one might drop

Table 5 – The Impact of Government Expenditures by Type of Expenditure on Investment, OECD Countries 60s, 70s, 80s and 90s (Regression Results)

Equation[a]	Constant	Exogenous Variables[b]		Adjusted R²	No of Observations
(1)	4.664 (21.82**)	−0.393 (−6.84**)	ln OUTL	0.65	87
(2)	4.517 (24.80**)	−0.364 (−7.23**)	ln DISB	0.66	87

(3)	4.442 (21.95**)	−0.442 (−6.09**)	ln FCE	0.60	91
(4)	3.755 (34.68**)	−0.214 (−5.21**)	ln TRA	0.58	87
(5)	3.497 (60.23**)	−5.153 (−5.62**)	ln INTSUB	0.58	87
(6)	2.881 (33.89**)	0.239 (4.19**)	ln PUBLINV	0.50	79

[a] Generalised least squares estimates using four time periods (60s, 70s, 80s and 90s) t-test in parentheses. **significant at 1 percent. — Dependent variable is average share of investment as per cent of gross domestic products. — [b] OUTL, average total government outlays as per cent of gross domestic product. — DISB, disbursements. — FCE, final consumption expenditures. — TRA, transfers. — INTSUB, interest payments and subsidies. PUBLINV, government gross fixed capital formation.

Source: Table 1, Tables A5–A9. — Own calculations.

capital formation from the respective growth regression to get a direct measure of the total impact (i.e. from both „channels") of the scope of government.[12] The additional estimates reveal that in the case of total outlays the coefficient of this variable rises to −1.88 (Table 3, Equation 4). Compared with the original regression (Equation 2) this is an increase of about 30 per cent.

8.   Conclusions

The central hypothesis of this study was that government expenditures on public goods have a positive impact on economic growth. However, as it was also suggested, the positive impact of government tends to decline or even reverse if government further increases expenditures and ultimately also provides private goods. An excess amount of public expenditures has a negative impact on economic growth and employment because the necessary taxes reduce the

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[12]   The resulting regression equation can be interpreted to be a reduced form of a structural model in which physical capital formation is predetermined by government expenditures.

incentives to work, to invest and to innovate. The study lends support to this hypothesis.

The empirical analysis of national accounts of the main OECD countries revealed that the supply of public goods in the 90s only accounted for about 14 percentage points of gross domestic product. Given the observation that the scope of government in European OECD countries, as measured by government shares, on average accounted for about 50 per cent of gross domestic product one may suggest that these countries have significantly surpassed the „optimum" of government activities and thus, accordingly to the hypothesis, should have reduced the growth potential of their economies considerably.

Regression analyses based on generalised least squares panel estimates for 21 OECD countries for 60s, 70s, 80s and 90s confirmed that total government expenditures as well as government expenditures by type of expenditure (such as disbursements, final consumption, transfers, subsidies and interest payments, public investments) did have had a negative impact on economic efficiency. This effect is – excepting transfers and public investments – statistically highly significant. Moreover, additional estimates indicate that a second „channel" was also operative: government also crowded out private investment in physical capital.

Based on these estimates a projection of economic growth revealed that a reduction of government's share by about 10 percentage points – i.e. about one standard deviation among OECD countries, or the difference between the share of European and non-European OECD countries in the 90s – would be associated with an increase of the average growth rate of about 0.5 percentage points per year.

Some people may suggest a reduction in the scope of government of this extent to be an illusion. But the case of Ireland shows that it is not: Since the mid-eighties Ireland reduced the share of government (which was about 51 per cent of gross domestic product) by 13.4 percentage points. After that, in the 90s Ireland became the fastest growing country in the OECD area. Some other countries like Belgium and the Netherlands have also begun to reduce the scope of government. According to the results of this study they have thereby strengthened the potential for economic growth.

Appendix

Table A1 – Capital Accumulation[a] in OECD Countries, 60s, 70s, 80s and 90s

Country	60s	70s	80s	90s[b]
Austria	25.3	27.6	24.4	26.5
Belgium	26.1	25.0	20.3	23.3
Denmark	28.3	27.5	21.5	18.5
Finland	36.8	35.6	31.7	20.7
France	28.1	28.9	25.0	23.2
Germany	31.1	28.0	24.3	23.8
Greece	26.6	28.6	19.3	17.8
Iceland	29.7	31.5	24.6	20.8
Ireland	23.4	27.9	23.6	18.0
Italy	32.0	27.3	24.1	22.1
Luxembourg	33.7	27.7	26.7	31.9
Netherlands	28.0	24.9	20.9	20.4
Norway	32.0	33.9	27.3	19.8
Portugal	23.4	24.6	20.1	14.3
Spain	26.0	26.6	24.0	26.5
Sweden	25.8	23.6	21.0	17.9
Switzerland	30.0	27.5	30.7	28.5
United Kingdom	18.8	18.4	17.3	16.6
Canada	22.9	23.4	25.4	25.4
United States	22.0	21.4	21.0	20.4
Japan	33.0	36.6	33.8	36.1
Australia	30.6	28.3	26.8	22.8
Mean	27.8	27.4	24.3	22.7
New Zealand	25.1	24.4	24.5	27.0

[a] Average share of investment as per cent of gross domestic product measured in international prices of 1985. — [b] 1991–1997.

Source: National Bureau of Economic Research (1997). —OECD (var. iss.). — Own calculations.

Table A2 –   Growth of the Labour Force[a] in OECD Countries, 60s, 70s, 80s and 90s

Country	60s	70s	80s	90s[b]
Austria	–0.56	0.10	1.20	1.38
Belgium	0.49	0.77	0.26	0.44
Denmark	1.28	1.21	0.81	–0.28
Finland	0.21	1.18	0.41	–0.08
France	0.72	0.86	0.62	0.48
Germany	0.11	0.41	0.83	–0.01
Greece	–0.98	0.54	1.48	1.14
Iceland	1.99	2.45	1.89	2.07
Ireland	0.00	1.09	0.45	2.36
Italy	–0.54	0.77	0.83	–0.64
Luxembourg	0.59	1.27	1.89	2.76
Netherlands	1.12	1.11	2.41	1.58
Norway	0.66	2.20	0.99	0.99
Portugal	0.51	1.93	1.26	0.05
Spain	0.75	0.40	1.28	0.90
Sweden	0.66	0.98	0.50	–0.90
Switzerland	1.45	0.10	1.10	1.63
United Kingdom	0.32	0.59	0.60	0.11
Canada	2.55	3.51	1.78	0.97
United States	1.72	2.46	1.61	1.06
Japan	1.33	0.92	1.22	0.87
Australia	2.77	1.93	2.37	1.12
New Zealand	2.19	1.78	2.15	1.68
Mean	0.84	1.24	1.21	0.86

[a] Average yearly growth rate of the Labour force. — [b] 1991–1997.

Source: OECD (var. iss.). — Own calculations.

Table A3 –   Human Capital Formation[a] in OECD Countries, 60s, 70s, 80s and
90s

Country	60s[b]	70s[c]	80s[d]	90s[e]
Austria	47.9	50.1	58.0	64.6
Belgium	27.6	34.6	45.6	50.4
Denmark	38.7	42.9	49.6	52.4
Finland	27.8	30.5	36.9	44.3
France	47.5	59.3	61.4	58.7
Germany	53.6	57.8	71.7	77.4
Greece	12.5	15.0	19.0	25.9
Ireland	23.2	30.1	38.9	45.6
Italy	12.7	23.9	34.3	47.9
Netherlands	40.6	51.4	58.6	65.4
Norway	24.3	34.0	44.1	53.2
Portugal	6.4	6.8	10.3	14.4
Spain	4.2	5.9	12.6	27.9
Sweden	30.2	37.4	44.0	50.6
Switzerland	41.7	53.3	62.4	72.2
United Kingdom	39.4	47.2	58.1	65.6
Canada	67.2	65.6	60.0	55.9
United States	75.2	73.5	64.8	58.4
Japan	38.7	48.3	56.8	65.0
Australia	37.9	48.3	51.7	55.0
New Zealand	53.8	55.8	57.8	59.6
Mean	35.8	41.5	47.5	52.9

[a] Human capital proxied by secondary school enrolment rates. — [b] 1969. — [c] 1970. — [d] 1980. — [e] 1990.

Source: De la Fuente, Donénech (2000).

Table A4 –   Initial Income[a] in OECD Countries, 1960, 1970, 1980 and 1990

Country	1960	1970	1980	1990
Austria	43.8	59.0	74.0	72.6
Belgium	58.6	73.0	87.5	86.3
Denmark	60.6	65.7	67.8	67.9
Finland	47.4	55.7	68.7	74.4
France	55.2	70.9	84.6	82.6
Germany	57.0	69.7	86.0	80.3
Greece	21.1	35.7	48.9	48.2
Iceland	51.5	51.3	70.8	67.9
Ireland	34.3	43.3	58.2	65.4
Italy	45.3	63.5	84.7	83.8
Luxembourg	76.8	83.3	89.8	103.1
Netherlands	70.1	83.4	92.2	85.0
Norway	58.5	63.7	79.7	79.5
Portugal	19.9	27.6	35.7	45.2
Spain	33.5	54.3	67.7	71.7
Sweden	71.0	76.2	78.4	77.2
Switzerland	82.5	89.3	93.2	89.2
United Kingdom	60.4	60.9	67.0	72.8
Canada	79.7	81.7	90.6	93.5
United States	100	100	100	100
Japan	20.5	37.8	51.4	61.5
Australia	78.8	82.8	86.0	82.4
New Zealand	87.1	79.1	77.7	69.1
Mean	57.1	65.6	64.5	76.5

[a] Gross domestic product per capita (worker) in international prices of 1985 relative to the United States (United States 1960, 1970, 1980, 1990 = 100).

Source: National Bureau of Economic Research (1997). — Own calculations.

Table A5 –   Government Disbursements[a] in OECD Countries, 60s, 70s, 80s and
1990

Country	60s	70s	80s	90s
Austria	31.9	37.7	45.0	47.6[b]
Belgium	33.9	45.0	55.6	52.1
Denmark	27.6	43.3	56.5	59.7[c]
Finland	25.4	32.4	40.2	56.2[b]
France	33.8	38.1	47.1	50.4
Germany	31.3	40.1	43.7	45.8
Greece	20.8	26.4	42.2	50.8[c]
Iceland	21.7	25.6	30.2	34.5[b]
Ireland	28.3	38.6	45.8	38.6[b]
Italy	29.1	37.3	45.5	50.7[b]
Luxembourg	29.6	38.7[d]	46.6	.
Netherlands	33.6	46.9	56.3	53.4[b]
Norway	31.1	41.1	43.4	46.5
Portugal	18.1	26.7	36.8	40.5[c]
Spain	15.7	23.0	35.0	41.4[b]
Sweden	31.8	47.4	59.3	64.1[b]
Switzerland	19.8	27.2	30.2	33.3
United Kingdom	31.6	38.0	41.5	41.7[b]
Canada	27.4	36.0	43.5	47.3
United States	26.5	30.3	34.2	34.5
Japan	13.7	20.1	26.4	27.1
Australia	20.4	28.3	33.9	35.8[b]
Mean	26.5	34.9	42.7	45.3

[a] Average government disbursements as per cent of gross domestic product. — [b] 1991–96. — [c] 1991–95. — [d] 1981–86.

Source: OECD (var. iss.). — Own calculations.

Table A6 –   Government Final Consumption[a] Expenditures in OECD Countries,
60s, 70s, 80s and 1990

Country	60s	70s	80s	90s
Austria	14.0	16.8	19.1	19.7
Belgium	13.0	15.9	16.4	14.5
Denmark	17.3	24.1	26.5	25.8
Finland	13.8	16.8	19.8	22.8
France	14.5	16.4	18.9	19.2
Germany	15.7	19.6	20.4	19.8
Greece	8.5	10.3	14.0	14.5
Iceland	11.4	15.6	18.1	20.4
Ireland	12.7	16.5	17.2	14.7
Italy	13.5	14.5	16.7	17.0
Luxembourg	9.1	11.5	13.1	12.6
Netherlands	14.1	16.4	16.0	14.3
Norway	14.8	18.6	19.6	21.1
Portugal	11.7	12.8	14.3	17.8
Spain	8.7	10.9	14.6	16.8
Sweden	18.9	25.6	27.8	26.9
Switzerland	10.1	12.0	13.3	14.5
United Kingdom	17.4	20.3	21.2	21.4
Canada	17.3	21.4	22.1	22.5
United States	17.6	17.3	17.7	16.4
Japan	7.8	9.3	9.5	9.5
Australia	12.9	16.4	17.9	17.5
New Zealand	12.2	15.2	16.8	15.5
Mean	13.3	16.3	17.9	18.1

[a] Average government final consumption expenditures as per cent of gross domestic product.

Source: OECD (var. iss.). — Own calculations.

Table A7 –   Government Transfers[a] in OECD Countries, 60s, 70s, 80s and 1990

Country	60s	70s	80s	90s
Austria	14.9	16.9	19.9	21.3[b]
Belgium	12.8	20.3	24.3	23.6
Denmark	9.1	13.4	17.3	20.5[c]
Finland	6.5	10.2	14.4	23.3[b]
France	15.9	16.9	21.4	23.0
Germany	12.7	15.7	16.4	17.9
Greece	7.1	8.0	14.1	16.2[c]
Iceland	8.0	6.1	5.0	6.7[b]
Ireland	6.4	11.2	15.3	14.2[b]
Italy	11.6	14.7	17.1	19.2[b]
Luxembourg	13.6	18.7	22.6[d]	.
Netherlands	16.6[e]	22.5	26.6	25.5
Norway	9.5	12.9	13.2	16.1
Portugal	3.2	7.9	10.9	13.3[c]
Spain	5.8	11.3	15.7	17.5[b]
Sweden	9.5	15.0	18.5	23.4[b]
Switzerland	7.0	11.5	13.5	16.6[c]
United Kingdom	7.8	9.8	12.8	14.6[f]
Canada	5.5	7.8	10.0	12.9
United States	5.9	9.8	11.0	12.8
Japan	4.4	7.6	11.1	12.5
Australia	5.5	7.5	9.3	11.3[b]
Mean	9.1	12.5	15.5	8.0

[a] Average government transfers as per cent of gross domestic product. — [b] 1991–96. — [c] 1991–95. — [d] 1981–86. — [e] 1968–70. — [f] 1991–94.

Source: OECD (var. iss.). — Own calculations.

Table A8 –   Government Interest Payments and Subsidies[a] in OECD Countries,
60s, 70s, 80s and 1990

Country	60s	70s	80s	90s
Austria	3.0	3.9	6.0	6.5[b]
Belgium	8.1	8.8	14.9	13.9
Denmark	1.2	5.8	12.7	13.3[c]
Finland	5.1	5.4	6.1	9.9[b]
France	3.4	4.8	6.8	8.1
Germany	3.0	4.8	6.9	8.1
Greece	5.2	8.1	14.1	20.2[c]
Iceland	2.2	4.0	7.1	7.3[b]
Ireland	9.1	10.9	13.3	9.4[b]
Italy	3.9	8.0	11.7	14.5[b]
Luxembourg	6.8	8.5	10.9[d]	.
Netherlands	7.0[e]	8.0	13.7	13.4[b]
Norway	6.8	9.6	10.7	9.3
Portugal	3.2	6.0	11.6	9.7[c]
Spain	1.1	0.8	4.7	7.0[b]
Sweden	3.5	6.8	13.0	13.7[b]
Switzerland	2.7	3.7	3.5	1.7[c]
United Kingdom	6.5	7.9	7.6	5.2[f]
Canada	4.7	6.8	11.4	11.9
United States	3.0	3.2	5.5	5.4
Japan	1.5	3.3	5.8	5.2
Australia	2.1	4.4	6.7	6.9[b]
Mean	4.2	6.1	9.3	4.1

[a] Average interest payments as per cent of gross domestic product. —[b] 1991–96. — [c] 1991–95. — [d] 1981–86. — [e] 1968–70. — [f] 1991–94.

Source: OECD (var. iss.). — Own calculations.

Table A9 –   Government Gross Capital Formation[a] in OECD Countries,
60s, 70s, 80s and 1990

Country	60s	70s	80s	90s
Austria	6.6	6.7	5.4	4.7[b]
Belgium	3.9	5.1	3.2	1.9
Denmark	4.5	4.6	2.8	2.1[c]
Finland	4.8	4.3	4.0	3.4[b]
France	4.5	4.0	3.5	3.4
Germany	5.7	5.5	3.8	4.7
Greece	.	.	.	.
Iceland	6.9	8.0	7.0	5.9[b]
Ireland	5.2	5.1	3.6	1.7[b]
Italy	3.7	4.0	4.8	3.7[b]
Luxembourg	4.2	6.7	7.4[d]	.
Netherlands	5.6	4.9	4.6	3.7[b]
Norway	4.1	4.9	3.8	3.7
Portugal	2.3	2.2	5.3	3.5[c]
Spain	3.7[e]	3.4	5.1	4.7[b]
Sweden	5.9	5.0	3.5	3.5[b]
Switzerland	.	.	.	.
United Kingdom	4.9	4.9	3.1	2.9[b]
Canada	4.9	4.1	3.7	2.9
United States	2.3	1.6	1.5	1.6
Japan	5.3	6.7	6.2	7.4
Australia	3.5	3.4	3.0	2.6[b]
Mean	3.5	3.6	3.2	2.4

[a] Average government gross capital formation as per cent of gross domestic product. —
[b] 1991–96. — [c] 1991–95. — [d] 1981–86. — [e] 1964–70.

Source: OECD (var. iss.). — Own calculations.

Table A10 – Correlation Matrix of Government Expenditures in OECD
Countries, 60s, 70s, 80s and 90s

Variables[a]	OUTL	DISB	FCE	TRA	INTSUB
OUTL	.	.	.	.	.
DISB	0.99**	.	.	.	.
FCE	0.70**	0.73**	.	.	.
TRA	0.87	0.87**	0.37**	.	.
INTSUB	0.83**	0.84**	0.47**	0.65**	.
PUBLINV	−0.19	−0.31**	−0.36**	−0.15	−0.27*

[a] OUTL, average total government outlays as per cent of gross domestic product. — DISB, disbursements. — FCE, final consumption expenditures. — TRA, transfers. — INTSUB, interest payments and subsidies. — PUBLINV, government gross capital formation. — The number of observations varies between 65 and 92. — *significant at 5 per cent, **at 1 per cent.

Source: Table1, Tables A5–A9. — Own calculations.

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