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WHAT IS THE OPTIMUM SIZE OF GOVERNMENT

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Acknowledgements

Content:

ABSTRACT

This paper discusses the theoretical foundations for the existence of an optimal size of government as depicted by an inverted U curve where the size of government is on the horizontal axis and economic growth is on the vertical axis. The evidence indicates that the optimum size of government, e.g. the share of overall government spending that maximizes economic growth, is no greater than 25% of GDP (at a 95% confidence level) based on data from the OECD countries. In addition, the evidence indicates that the optimum level of government consumption on final goods and services as a share of GDP is 10.4% based on a panel data of 81 countries. However, due to model and data limitations, it is probable that the results are biased upwards, and the "true" optimum government level is even smaller than the existing empirical study indicates. Optimal government size is also, of course, influenced by the quality of a government. Because the measures of "government quality" are inherently subjective, no attempt was made to incorporate them in this study.

1. Introduction

The optimal size of the government is a problem that has attracted the attention of researchers for decades. Professor Arthur Laffer illustrated that there is tax revenue maximizing tax rate, and in a similar way other authors try to identify the government share of GDP which maximizes the GDP growth. Total government spending as a percent of GDP has grown continuously in 20th century and is close to an average of 41% for the OECD countries. Economic growth has suffered from the increase of taxation and government spending which has been above optimal levels in most countries.

Many see government as an agent striving to correct the inadequacies and excesses of the unrestrained markets. The government provides the public goods the market is incapable of providing and removes the distortions in the allocation of resources due to externalities. Others view politicians, public sector employees, and special interest groups as seeking to use the power of the government for their own purposes. Distortions arising from political decision making can outweigh the benefits from government activities, thus reducing social welfare. When this occurs, government is no longer a solution but is a problem. It is probable that both hypotheses are right in different circumstances.

Most previous studies find a strong and statistically significant negative relationship between the two variables of interest at a relatively low level of government spending, which means the empirical evidence for most countries argues for smaller government and reduced public spending. The quality of the government in providing goods and services, in addition to the size of government, is also important in the efficient provision of public goods, but this is not the focus of this paper.

The purpose of this paper is to estimate the optimum size of government, e.g. the share of government spending that maximizes economic growth. The use of cross-

country analysis in assessing the optimal government share of GDP has deficiencies because each country has individual characteristics.

In Section 2, a literature review of the effect of government size on the economic development is presented. Section 3 explains the applied methodology. The empirical analysis is presented in Section 4, including data sources and a discussion of the results. Section 5 concludes and delineates the topics for further research.

2. Literature Review

Although a large number of empirical studies have been conducted, there is no consensus on the impact of government size on economic growth. Most economists believe[1] a larger government size than a certain optimal level has detrimental impact on economic growth due to the inefficiencies inherent in government. Government has as its most basic function the protection of people and property which is the foundation for the efficient operation of a market economy. In addition, a provision of limited set goods and services, called public goods, such as roads and national defense, may also enhance economic growth.

However, Gwartney et al.[2] states, "as governments move beyond these core functions, they will adversely affect economic growth because of (a) the disincentive effects of higher taxes and crowding-out effect of public investment in relation to private investment, (b) diminishing returns as governments undertake activities for which they are ill-suited, and (c) an interference with the wealth creation process, because governments are not as good as markets in adjusting to changing circumstances and finding innovative new ways of increasing the value of resources". Daniel Mitchell[i] concludes "government spending undermines

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[1] For a comprehensive review of literature and a brief discussion on the findings of related studies see Appendix II.

[2] Gwartney, J., Lawson, R. and Holcombe, R. (1998). "The size and functions of government and economic growth," *Joint Economic Committee,* p. (V)

economic growth by displacing private-sector activity. Whether financed by taxes or borrowing, government spending imposes heavy extraction and displacement costs on the productive sector."

There are some economists who argue that a larger government is likely to speed economic growth by providing public goods and correcting for market failures. According to this school, government consumption is also likely to increase investment and employment via multiplier effects on aggregate demand. In addition, Wagner's Law suggests a more-than-proportionate increase in government expenditure when economic growth accelerates because there will be a need for more administrative and protective functions of the state, a need for increased provision of social and cultural goods and services, and an increased need for provision of proper administrative and bureaucratic controls to ensure the smooth operation of market forces (Wahab[ii]).

The growth-maximizing level of government size

Barro (1989[3]) Armey et al. (1995[4]) and Rahn et al. (1996[5]) and Scully (1998[6], 2003[7]) did theoretical and empirical research and popularized the existence of an optimal size of government as depicted by an inverted U curve (therefore, we will refer to it as "BARS[ii] Curve" after Barro, Armey, Rahn, and Scully). As the size of government, measured on the horizontal axis, expands from zero (complete

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[3] Barro, R. (1989). "A Cross - Country Study of Growth, Saving and Government," *NBER Working Paper No. 2855*

[4] Armey, D. and Armey, R. (1995). "The Freedom Revolution: The New Republican House Majority Leader Tells Why Big Government Failed, Why Freedom Works, and How We Will Rebuild America, ",*Washington, D.C.; Regnery Publishing Inc. .*

[5] Rahn, R. and Fox, H. (1996). "What Is the Optimum Size of Government," *Vernon K. Krieble Foundation*
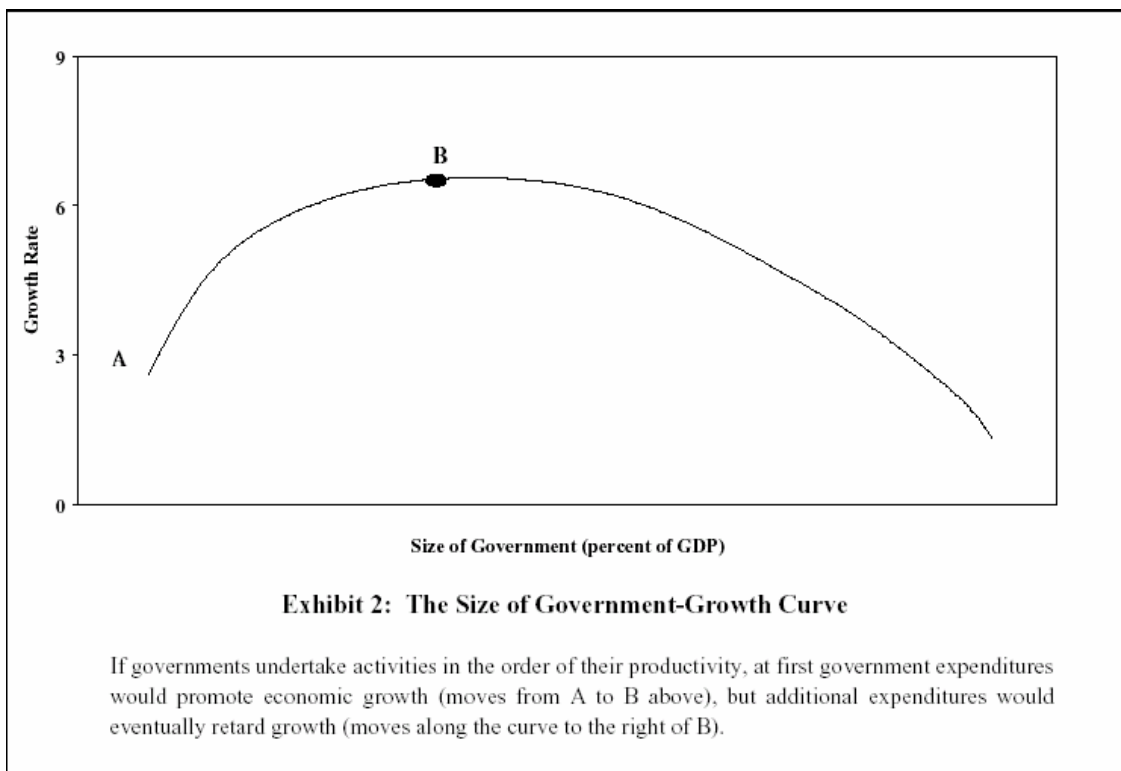
[6] Scully, G. (1998). "Measuring the Burden of High Taxes," *National Center for Policy Analysis Policy Report No. 215*

[7] Scully, G. (2003). "Optimal taxation, economic growth and income inequality," *Public Choice 115: 299–312*

anarchy), initially the growth rate of the economy—measured on the vertical axis—increases. As government continues to grow as a share of the economy, expenditures are channeled into less productive (and later counterproductive) activities, causing the rate of economic growth to diminish and eventually decline.

Figure 1: The BARS Curve

Exhibit 2: The Size of Government-Growth Curve

If governments undertake activities in the order of their productivity, at first government expenditures would promote economic growth (moves from A to B above), but additional expenditures would eventually retard growth (moves along the curve to the right of B).

Source: Gwartney, J., Lawson, R. and Holcombe, R. (1998). "The size and functions of government and economic growth," Joint Economic Committee, p. 5, Exhibit 2

The research studies[8] using various empirical techniques and different sets of counties conclude that the optimal government size (total government spending as a share of GDP) is between 17% and 40% of GDP, and the mode of the estimates is in

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[8] See Appendix II for a comprehensive review of these studies.

the range of 20 to 30% of GDP, much lower than the current government share in most developed countries[9]. In 2007 the OECD average of total final government expenditures is 40.4% of GDP, while for the Euro area the average is 46.2% of the GDP.

3. Methodology

1) The Scully Model

Scully (1998[10], 2003[11]) developed a model that estimates the share of government spending (or general tax rate) that maximizes real economic growth. Following the exposition of the model, the production function is specified in Cobb-Douglas form:

$$Y = a(G_{t-1})^b \left[\left(1 - \tau_{t-1}\right) Y_{t-1} \right]^c \qquad (1),$$

where Y is real GDP, G is total government spending (in constant prices), τ is total tax rate in the economy measured as the share of government spending as a percentage of GDP.

A balanced-budget assumption is made that $G = \tau Y$ each year. By substituting this assumption in equation (1), we obtain:

$$Y_t = a(\tau_{t-1} Y_{t-1})^b \left[\left(1 - \tau_{t-1}\right) Y_{t-1} \right]^c \qquad (2)$$

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[9] See Appendix I, table 1.

[10] Scully, G. (1998). "Measuring the Burden of High Taxes," *National Center for Policy Analysis Policy Report No. 215*

[11] Scully, G. (2003). "Optimal taxation, economic growth and income inequality," *Public Choice 115: 299–312*

By finding the first and second differential of Y with respect to τ, Scully shows that the maximum real output is derived when government spending as a share of GDP equals the following: $\tau^* = \dfrac{b}{b+c}$.

Thus, we use the following equation to estimate the optimum level of government spending:

$$\ln(y_{i,t}) = \ln(a) + b\ln(\tau_{i,t-1}Y_{i,t-1}) + c\ln\left[\left(1 - \tau_{i,t-1}\right)Y_{i,t-1}\right] \qquad (3),$$

where the index i indicates the country (i = 1,…..,28), the index t indicates the period (t = 1970, ……, 2007); $y_{i,t}$ is real GDP per capita for i country in year t. The panel is unbalanced due to non-availability of data.

Critique of the model

Roderick Hill[12] points out that the relationship in the Scully model produces spurious estimates of an 'optimal tax rate.' He cites an unpublished study by E. Sieper (1997), commissioned for The Treasury, Government of New Zealand, and concludes that in order for the Scully model to be derived from a simple endogenous growth model, it requires that the rate of depreciation is 100 percent per year, e.g. "capital is entirely used up in the process of annual production." In other words, Scully's model ignores the contribution of earlier periods' capital goods to output. In his reply, Scully[13] noted that the contribution of previously-accumulated capital and technological change in the aggregate production function are implicitly captured by the presence of the lagged production term.

2) Quadratic equation

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[12] Hill R. (2008). "Optimal taxation and economic growth: a comment," *Public Choice, 134: 419–427*
[13] Scully, G. (2000). "The Growth-Maximizing Tax Rate," *Pacific Economic Review, Vol. 5, No 1*

In order to test the relationship between general government consumption expenditures and economic growth that is theoretically characterized by the inverted U curve, we use a simple quadratic equation following Vedder and Gallaway[14], Pevcin[15] and Davies[16].

$$1 + g_{i,t} = a + b(GC)_{i,t} + c(GC)_{i,t}^2 \qquad (4),$$

The government consumption as a share of GDP that maximises economic growth from the quadratic function above is found to be the following after differentiating the g with respect to GC : $GC^* = -\dfrac{b}{2c}$.

We estimate the following equation:

$$1 + d(\ln(GDP_{i,t})) = a + b(GC)_{i,t} + c(GC)_{i,t}^2 \qquad (5),$$

where the index i indicates the country ($i = 1,\ldots,81$), the index t indicates the period ($t = 1961, \ldots, 2005$); $d(\ln(GDP_{i,t}))$ represents real growth of GDP, GC is general government consumption expenditures as a share of GDP.

Baltagi[17] lists several benefits from using panel data. These include the following:

1) Controlling for individual heterogeneity, panel data suggests that countries are heterogeneous. Time-series and cross-section studies which do not control this heterogeneity run the risk of obtaining biased results. Panel data

[14] Vedder, R. and Gallaway, L. (1998). "Government Size and Economic Growth," *Joint Economic Committee*

[15] Pevcin, P. (2004). "Does Optimal Size of Government Spending Exist?," *University of Ljubljana*

[16] Davies, A. (2008). "Human Development and the Optimal Size of Government," *Journal of Socioeconomics*

[17] Baltagi, B. (2005). "Econometric Analysis of Panel Data," Third Edition, John Wiley & Sons Ltd., pp. 4-7

are able to control for these state- and time-invariant variables whereas a time-series study or a cross-section study cannot.

2) Panel data give more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency. While time-series studies are plagued with multicollinearity, this is less likely with a panel across the OECD countries or a world set of countries since the cross-section dimension adds a lot of variability, adding more informative data on independent variables.

3) Panel data are better able to study the dynamics of adjustment.

4) Panel data are better able to identify and measure effects that are simply not detectable in pure cross-section or pure time-series data.

We use cross-section time-series regressions and we use dummy variables to take into account specific country and time effects, and robust standard errors to control for heteroskedasticity or serial correlation.

4. Empirical Analysis

Data

Definition of government size

According to the System of National Accounts (SNA 1993) "*The general government sector consists of the totality of institutional units which, in addition to fulfilling their political responsibilities and their role of economic regulation, produce principally non-market services (possibly goods) for individual or collective consumption and redistribute income and wealth.*" SNA distinguishes between two types of production, and refers to them as market and non-market activities. Goods and services sold on the market

are regarded as output of public corporations, not government. They are valued at market prices, even if these prices are less than cost. Examples are publicly-owned telecommunications, railways, utilities, etc. Goods and services which are produced by state employees and distributed without charge (or at prices which are not economically significant) are deemed to be the output of general government. These include the activities of government ministries, but they also include activities of public non-market institutions such as schools, provided they are both controlled and financed by government. This means that the general government sector does not include public corporations or quasi-corporations, although they are part of the public sector (see Government Finance Statistics Manual (2001)).

The general government sector can be divided into three levels: central, state (or regional) and local. However, not all countries have these three levels, depending on the political organization and level of fiscal decentralization of each economy.

There are various ways in which the size of government is measured in the literature – these are usually spending-based or revenue-based measures. Furthermore, estimating the government and public sector employment also provides information on the size of government sector.

Total general government expenditures include all types of outlays by the government sector. This figure presents the consolidated spending of all three levels of the government sector and as such is deemed to be most comprehensive measure of spending by the government. However, as Pevcin[18] points out, fiscal instruments are only one part of the two instruments used by the government, the other one being regulation. Therefore, the government budgets tend to underestimate the true size of the government sector due to the existence of other forms of intervention, such as regulation of economic activities or state ownership of enterprises. These

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[18] Pevcin, P. (2004). "Cross-country Differences in Government Sector Activities", *Zb. Rad. - Sveuc. u Rij., Ekon. fak., god. 22. Sv. 2, str. 41-59*

non-budget items have the impact of a tax or an expenditure programme on the private sector, since public finance policies do affect the functioning of markets and the behavior of economic players. Low administrative burdens are usually conducive to higher economic growth and greater productivity potential of the economy (see Action Programme for Reducing Administrative Burdens in the European Union, COM(2007)23). It is obvious that not only the size, but also the regulatory scope of the government sector is important.

The general government expenditures can be divided into several sub-categories:

1) Final general government consumption expenditure – according to SNA 93 it consists of *expenditure, including imputed expenditure, incurred by general government on both individual consumption goods and services and collective consumption services.* In other words, government consumption is the sum of all goods and services provided without charge to individual households and collectively to the community. It includes goods and services purchased from the private sector as well as those produced by government.

    The principle behind the broad definition of government consumption is that consumption is private only when households are free to choose how or whether to spend the income. Government transfers in kind, such as food, housing, health care and schooling, are thus classified as government consumption (see United Nations, World Public Sector Report, Globalization and the State, 2001).

    Government consumption is a component of the expenditure method of measuring GDP:

    $$GDP = C + I + G + (X - M) \qquad (6),$$

    where *C* is private consumption, *I* is gross investment, *G* is government consumption expenditures on final goods and services, and *(X-M)* is exports

minus imports (net exports). Therefore, *G* is available for most countries as it is estimated as part of national income accounts.

2) Transfers and subsidies - governments also provide cash payments to households and producers. When the recipient is a household, the payment is defined in the SNA as a current transfer payment. When the recipient is a private or public institution, it is defined as a subsidy or, when tied to the acquisition of fixed assets, as a capital transfer. Transfer payments also include payment of interest on the national debt, provision of public pensions for the elderly, income support for the unemployed and other cash outlays.

3) Public investment of capital spending - this is the aggregate of government capital formation, purchases of land and intangible assets, and capital transfers to non-government sectors.

Another measure of government size is **central government expenditure**, which includes cash transfers and subsidies as well as outlays for consumption and investment. However, these statistics have two drawbacks (see United Nations, World Public Sector Report, Globalization and the State, 2001). First, they record investment expenditure, rather than depreciation of capital, and consequently all the outlay for a large highway or a new port, for example, shows up in the year of construction and not in subsequent years when it is actually in use. Second, the statistics include only transfers to lower levels of government, and thus ignore self-financed expenditures of local governments.

Another measure of government size is **total government revenues** that comprise the following sub-components:

1. Total government tax revenues that include direct tax revenues (profit tax revenues and personal income tax revenues); indirect tax revenues (such as

revenues from VAT, sales tax, excise duties); and revenues from social security payments.

2. General government net lending.

3. Sale of state assets.

4. Capital revenue, fees, etc.

Data Availability and Data Sources

In the empirical analysis, two measures are used as proxies of the budgetary government. The first measure is total general government expenditures as a percentage of GDP. The sample consists of 28 countries – members of the OECD. The time span is from 1970 to 2007. The sample of countries for which data on capital stock is available consists of 17 OECD countries over the period 1977-2004. Data on government expenditures as a share of GDP and data on capital stock volume (smoothed) is available from the OECD Economic Outlook Database. Data on gross domestic product in constant prices is obtained from the World Development Indicators of the World Bank.

The general government consumption expenditures are used as another measure of government size, although they do not account for the full government size. As a component of the expenditure method for estimating GDP, it is widely available. Data is taken from World Development Indicators of the World Bank. The sample consists of 81 countries over the period 1961-2005. The panel is balanced and consists of 3645 observations.

Due to lack of data, we are not able to conduct a cross-section time-series analysis of the impact of total government share (defined as total general government expenditures) on economic growth on a larger sample of countries. According to Wagner's Law, more developed countries should have larger governments because

the government's share in GDP increases more than proportionally in GDP (Directorate-General for Economic and Financial Affairs, EC, 2008). Thus, we believe that a panel data analysis over a large sample of countries would add to the theoretical debate but due to lack of data, we are not able to conduct it.

As the Department of Economic and Social Affairs of the United Nations Secretariat (2004) states, "compilation of consolidated general government accounts, especially expenditure by function, should be a priority. Once a country has such accounts, attention can be focused on remaining problems such as quantification of tax expenditures, the quasi-fiscal impact of regulation and trade restrictions, and the need to move from cash to accrual reporting of expenditure in the public sector. All of these problems, important as they are, are minor compared with that of the complete lack of consolidated general government accounts in all countries, and the lack of any accounts at all for lower levels of government in most developing countries."

Results

In equation (7) we report the estimated coefficients of the Scully model using panel generalized least squares (EGLS) method with period fixed effects. The panel consists of 854 observations with 28 countries over the period 1970-2007.

$$\ln(y_{i,t}) = \underset{(54.44)}{3.023} + \underset{(4.44)}{0.1534} \ln(\tau_{i,t-1} Y_{i,t-1}) + \underset{(14.25)}{0.4631} \ln\left[\left(1 - \tau_{i,t-1}\right) Y_{i,t-1}\right] \qquad (7)$$

In parenthesis are presented the *t*-statistics. They show that all coefficients are statistically significant at 1 percent. Standard errors are robust to cross-equation correlation as well as different error variances in each cross-section. Thus, empirical results show that the optimal or growth-maximizing rate of government expenditures as a share of GDP amounts to 25%.

The result shows that almost all countries from the sample are on the negative side of the inverted U curve (the BARS Curve as referred above). The Republic of Korea, with a general government spending of 30.7% of GDP in 2007, is closest to the optimal government size as estimated by the Scully model but still is 5 percentage points above the optimum level and is very probably going to be on the negative side as well. In Denmark, Hungary, France and Sweden government expenditures as a share of GDP exceed 50% in 2007 (see table 1 in Appendix 1). According to the models presented here, income per capita in these economies has grown more slowly than it would have if the size of government had been constrained to the growth-maximizing level.

In equation (8), we report the estimated coefficients of the quadratic form of the relationship of the economic growth with respect to government consumption using panel least squares method with period and cross-section fixed effects. The panel consists of 2650 observations with 81 countries over the period 1961-2005.

$$1 + d(\ln(GDP_{i,t})) = \underset{(9.43)}{0.9264} + \underset{(2.14)}{2.256(GC)_{i,t}} - \underset{(-3.77)}{10.457(GC)_{i,t}^2} \qquad (8)$$

In parenthesis are presented the *t*-statistics. They show that all coefficients are statistically significant at 5 percent. Standard errors are robust to arbitrary serial correlation and time-varying variances in the disturbances. Results are consistent with the suggested hypothesis – government consumption expenditures are detrimental to economic growth after a certain point and that is why the coefficient of the square term of government consumption is negative. Thus, empirical results show that the optimal or growth-maximizing rate of government consumption as a share of GDP amounts to 10.8%.

In most developed countries, government consumption as a share of GDP exceeds this threshold by several percentage points. For example, in 2005 government consumption as a share of GDP is 18% in Australia and Austria, 23% in Belgium,

25.9% in Denmark, 22% in United Kingdom, 16% in USA, 27% in Sweden. On the positive side are Singapore and India where government consumption is 10.4% of GDP, and Chile – 10.9% (see table 2 in the appendix).

Discussion of Results

There are some conceptual and data limitations in using econometric models in estimating the optimal government size.

First, due to data non-availability, we have to deal with truncated data, i.e., few observations on the left side of the optimum. This leads to upward biased results.

Second, as Lawrence Hunter noted "as countries become more developed (socially, politically and economically), rent seeking and politicization become pervasive." If this is the case, "then it will be empirically true […] that nations gravitate toward the revenue-maximizing level. […] Then what we would expect to observe in the real world when we impose upon it an econometric model and 'test' it against the data, is that even though the general prediction holds true (namely there are diminishing returns to government spending), nevertheless there is an upward bias in the data, call it the rent-seeking bias. In other words, if all countries are skewed to the right due to rent seeking, then our models will fit that relationship—not the true relationship of spending relative to the output-maximizing optimum. Thus, all such studies will create a false sense of precision on how closely it is possible to pinpoint the output-maximizing size of government given that it is not possible to observe instances where the rent-seeking bias does not contaminate the data."

As such, the results from the above mentioned models should not be taken as the "true" optimal level of government due to limitations of the models, and lack of data as already discussed. As Dan Mitchell commented, government spending was about 10% of GDP in the West from the end of the Napoleonic wars to World War I.

And we do not have any data to think that growth would have been higher if government was doubled or tripled. However, what the empirical results do show is that the government spending should be much less than is the average of most countries at the moment.

Thus, we can confidentially say the optimum size of general government is no bigger than 25% but is likely to be considerably smaller because of the above-mentioned reasons.

5. Conclusion

Over the past century there has been a significant expansion of government intervention in the economy of all OECD countries and all over the world through greater government spending as a percentage of GDP. Many studies have shown that there is a negative relationship between government size and economic growth after a certain point of government participation in the economy is reached. The government has as its core functions the protection of person and property, establishing the rule of law, the sanctity of contract, and perhaps the creation of a limited set of public goods. However, growing above these functions, the government is likely to be detrimental to economic growth.

In this paper, we examined the optimal size of government (measured as overall government spending as a percentage of GDP) that maximizes economic growth for a set of OECD countries. The overall results suggest that the optimal level of government spending is 25% according to the Scully model. However, due to model and data limitations, the evidence is that the results are biased upwards, and the "true" optimum government level is even smaller and depends also on the quality of a government, and not only its size.

These results are in line with other empirically based studies which show that the government size should not exceed the range from 20 to 30 percent of GDP if economic growth is to be maximized. This is due to the inefficiency of allocation of scare resources in the public sector and the crowding-out effect that government investment has on private investment.

Furthermore, examining the relationship between general government consumption on final goods and services for a set of 81 countries, we estimate that the optimal size of government consumption is 10.4% of GDP.

Regarding possible further empirical research, one could test the relationship between good fiscal governance and government size and try to estimate the optimal composition of public expenditure. Also, finding a more proper measurement of government size that includes not only budget items but also takes into account the level of regulation and administrative burden would be a significant contribution to the research question on the optimal size of government.

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Appendix I

Table 1: Total general government expenditure as a percentage of GDP

country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Australia	35.7	37.8	38.3	37.8	38.2	38.2	37.2	36.3	35.2	34.8	35.2	35.9	35.4	34.6	35.1	34.8	34.5	34.7
Austria	51.5	52.4	53.0	56.0	55.6	56.0	55.6	53.1	53.6	53.1	51.5	50.8	50.5	50.9	52.8	49.7	49.2	48.2
Belgium	52.2	53.3	53.6	54.6	52.4	51.9	52.2	51.0	50.2	50.1	49.1	49.1	49.8	51.2	49.3	51.8	48.4	48.7
Canada	48.8	52.3	53.3	52.2	49.7	48.5	46.6	44.3	44.8	42.7	41.1	42.0	41.2	41.2	39.9	39.2	39.3	39.0
Czech Republic	..	..	..	..	..	54.0	42.4	43.2	43.1	42.2	41.7	44.2	46.2	47.1	44.8	44.6	43.0	41.8
Denmark	55.9	56.5	57.0	60.1	60.0	59.1	58.7	56.4	56.0	55.1	53.3	53.9	54.2	54.7	54.3	52.4	50.9	50.3
Finland	47.9	56.5	61.7	64.3	63.8	61.4	59.8	56.3	52.6	51.6	48.4	47.9	49.0	50.1	50.3	50.5	48.8	47.5
France	49.4	50.6	52.0	54.9	54.2	54.4	54.5	54.1	52.7	52.6	51.6	51.6	52.6	53.2	53.3	53.5	52.7	52.4
Germany	43.6	46.1	47.3	48.3	47.9	48.3	49.3	48.3	48.1	48.2	45.1	47.5	48.0	48.4	47.3	47.0	45.4	43.8
Greece	44.9	41.8	44.3	46.6	44.8	45.8	44.1	45.0	44.4	44.4	46.7	45.3	44.8	45.0	45.4	43.1	42.3	43.3
Hungary	..	55.8	59.7	59.3	62.8	55.3	52.1	50.0	51.5	48.6	46.5	47.2	51.2	49.1	48.8	49.9	51.9	50.1
Iceland	41.5	42.9	43.8	43.6	43.4	42.7	42.2	40.7	41.3	42.0	41.9	42.6	44.2	45.6	44.1	42.2	41.7	43.1
Ireland	42.9	44.5	44.9	44.7	44.0	41.2	39.2	36.7	34.5	34.1	31.5	33.3	33.6	33.4	33.8	33.8	34.2	36.7
Italy	52.9	54.0	55.4	56.4	53.5	52.5	52.5	50.2	49.3	48.2	46.1	48.0	47.4	48.3	47.8	48.2	48.8	48.5
Japan	32.0	31.6	32.5	34.3	35.5	36.5	36.8	35.7	37.1	38.6	39.0	38.6	38.8	38.4	37.0	38.4	36.0	35.8
Korea	20.0	20.9	22.0	21.6	21.0	20.8	21.7	22.4	24.7	23.9	23.9	25.0	24.8	30.9	28.1	28.9	30.3	30.7
Luxembourg	37.8	38.4	40.0	39.8	39.0	39.7	41.2	40.7	41.0	39.1	37.7	38.1	41.5	41.9	42.6	41.8	38.7	38.0
Netherlands	54.9	54.9	55.7	55.7	53.5	51.6	49.4	47.5	46.7	46.0	44.2	45.4	46.2	47.1	46.1	45.2	46.1	45.9
New Zealand	53.2	50.3	49.4	45.7	42.9	42.0	41.0	41.7	41.4	41.0	39.6	38.5	38.4	38.8	38.7	40.5	41.0	41.7
Norway	53.3	54.5	55.7	54.6	53.7	50.9	48.5	46.9	49.2	47.7	42.3	44.2	47.1	48.3	45.6	42.3	40.6	40.6
Poland	..	..	..	..	..	47.7	51.0	46.4	44.3	42.7	41.1	43.8	44.2	44.6	42.6	43.3	43.8	42.4
Portugal	40.5	43.4	44.5	46.1	44.3	43.4	44.1	43.2	42.8	43.2	43.1	44.4	44.3	45.5	46.5	47.6	46.3	45.8
Slovak Republic	..	..	..	..	54.9	48.4	53.5	48.8	45.7	47.7	50.7	44.4	44.9	40.2	37.8	38.1	37.2	36.9
Spain	42.8	44.3	45.4	49.0	46.7	44.4	43.2	41.6	41.1	39.9	39.1	38.6	38.9	38.4	38.9	38.5	38.6	38.7
Sweden	59.7	61.1	69.3	70.9	68.4	65.3	62.9	60.7	58.5	60.2	57.0	61.2	55.8	56.0	54.4	54.0	53.1	51.3
Switzerland	30.3	32.1	34.2	35.1	35.2	35.0	35.3	35.5	35.8	34.3	35.1	34.8	36.2	36.4	35.9	35.4	34.0	33.4
United Kingdom	41.9	43.6	45.6	45.7	45.0	44.5	42.7	41.2	39.9	39.3	37.0	40.4	41.4	42.8	43.1	44.9	44.9	44.7
United States	37.1	37.8	38.5	38.0	37.0	37.0	36.5	35.4	34.7	34.3	34.2	35.3	36.3	36.8	36.4	36.7	36.7	37.4
Euro area	**50.4**	**49.3**	**50.5**	**52.2**	**51.0**	**50.6**	**50.7**	**49.4**	**48.6**	**48.2**	**46.2**	**47.3**	**47.6**	**48.1**	**47.6**	**47.5**	**46.8**	**46.2**
Total OECD	**40.9**	**41.3**	**42.4**	**42.9**	**42.2**	**42.1**	**41.8**	**40.6**	**40.2**	**39.9**	**39.1**	**40.1**	**40.7**	**41.2**	**40.6**	**40.9**	**40.4**	**40.4**

Source: OECD Economic Outlook 83 database

Table 2: General government final consumption expenditure (% of GDP)

country	1961	1970	1980	1990	2005
Australia	12.06	13.82	17.53	17.54	12.13
Austria	12.67	14.77	18.1	18.71	18.14
Belgium	14.87	16.76	22.83	20	22.94
Brazil	14.64	11.32	9.2	19.29	20.05
Chile	10.03	12.44	12.45	10	10.96
China	7.12	7.76	14.98	14.23	14.47
Denmark	14.38	20.31	27.06	25.12	25.87
Finland	12.01	14.78	18.28	21.65	22.15
France	16.86	17.24	21.36	21.73	23.77
Greece	8.67	9.7	11.99	13.42	14.24
Iceland	10.9	13.75	17.61	19.92	24.57
India	7.17	9.27	9.98	11.67	10.42
Indonesia	10.89	7.99	10.53	8.85	8.08
Ireland	13.1	15.44	20.94	16.26	15.85
Italy	14.14	15.37	16.92	20.13	20.42
Japan	10.99	10.65	14.05	13.4	18.09
Korea	14.22	9.76	12.44	11.81	14.17
Luxembourg	10.17	10.75	17.08	15.78	16.99
Mexico	5.71	7.26	10.04	8.38	11.55
Netherlands	16.56	19.42	24.78	23.03	24.1
Norway	12.41	16.37	19.16	21.17	20.07
Portugal	11.16	12.37	13	15.6	21.19
Singapore	9.2	11.93	9.74	10.12	10.47
Spain	8.8	10.13	13.97	16.68	17.96
Sweden	16.29	22.02	29.62	27.23	27.1
Switzerland	7.34	8.33	10.12	11.13	11.4
United Kingdom	16.94	18.22	21.79	20.14	21.98
United States	17.23	18.34	16.75	17	15.95
Average	**12.02**	**13.44**	**16.51**	**16.79**	**17.68**

Source: World Development Indicators, World Bank

Appendix II: Extensive Literature Review

The results of the investigations on the effect of government spending on economic growth have been diverse and extensive.

In 1983, the Daniel Landau's study[19] suggests a negative relationship exists between the share of government consumption expenditure in GDP and the rate of growth of per capita GDP.

An empirical analysis of the data from 23 OECD countries (Gwartney et al.[20]) shows a strong negative relationship between both (a) the size of government and GDP growth and (b) increases in government expenditures and GDP growth. A 10 percentage point increase in government expenditures as a share of GDP is associated with approximately a one percentage point decline in the growth rate of real GDP. An analysis of a larger data set of 60 countries reinforces the conclusions reached by analyzing the OECD countries. After adjustment for cross-country differences in the security of property rights, inflation, education, and investment, higher levels of government spending as a percentage of GDP exert a strong negative impact on GDP growth.

In a study[21] published in June 1997 on a sample of 20 European countries for the period 1950-1990, Georgios Karras concludes that "the marginal productivity of government services may be negatively related to government size: the public sector may be more productive when small."

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[19] Landau, D. (1983). "Government Expenditure and Economic Growth: A Cross-Country Study," *Southern Economic Journal*

[20] Gwartney, J., Lawson, R. and Holcombe, R. (1998). "The size and functions of government and economic growth," *Joint Economic Committee*

[21] Karras, G. (1997). "On the Optimal Government Size in Europe: Theory and Empirical Evidence," *The Manchester School of Economic&Social Studies, Blackwell Publishing, vol. 65(3), pages 280-94, June*

A 1997 study by James Guseh[22] concludes that growth in government size is negatively associated with economic growth, but the negative effects are greater in non-democratic socialist systems than in democratic market systems. Overall, the negative impact of government in countries with non-democratic socialist institutions is three times that of countries with democratic market institutions. For example, a 10% increase in government size yields a 0.74% decline in economic growth in democratic mixed economic systems, a 1.11% decline in democratic market systems, and a 3.29% decline in non-democratic socialist systems, ceteris paribus.

The results in a 2004 study by Primož Pevcin[23] indicate that a one-percentage point increase in government spending is associated with an approximately 0.15 percentage point reduction in real economic growth rate.

Simulations for the American economy after the World War II by Charles Carlstrom and Jagadeesh Gokhale (1991)[24] show that with no deficit financing a permanent rise in government consumption leads to lower long-run output. For an increase in expenditure of the magnitude of 4 percent per year, output declines by about 2 percent. With deficit financing, output is higher in the short run, but declines considerably in the long run.

Findings by Lowell Gallaway and Richard Vedder (1995)[25] in a study on the American economy for the period 1947-1994 indicate that for every dollar government spending is reduced and a dollar's worth of resources is freed up to be used by the private sector, an additional 38 cents of output and income will be created in the initial year of the reduction, and over a seven year period, the total

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[22] Guseh, J. (2007). "Government Size and Economic Growth in Developing Countries: A Political-Economy Framework," *Journal of Macroeconomics, Elsevier, vol. 19(1), pages 175-192, January*
[23] Pevcin, P. (2004). "Does Optimal Size of Government Spending Exist?," *University of Ljubljana*
[24] Carlstrom, C. and Gokhale, J. (1991). "Government Consumption, Taxation, and Economic Activity," *Federal Reserve Bank of Cleveland Economic Review, 3rd Quarter, pp. 18-29*
[25] Gallaway, L. and Vedder, R. (1995). "The Impact of the Welfare State on the American Economy," *Joint Economic Committee of Congress Study, Washington D.C., December*

increase in income will be $2.45. This constitutes a powerful argument for reducing levels of Federal government spending.

Empirical evidence by Andrea Bassanini and Stefano Scarpetta (2001)[26] from a pooled cross-country time-series analysis of the OECD countries supports the notion that the overall size of government in the economy may reach levels that hinder growth. The results suggest that for a given level of taxation, higher direct taxes lead to lower output per capita, while, on the expenditure side, government consumption and government investment tend to have non-negative effects on output per capita. Government investment may also influence growth by improving the framework conditions (e.g. better infrastructure) in which private agents operate.

In a 2002 study, Atul A. Dar and Sal AmirKhalkhali[27] examine the growth–government size relationship for 19 developed countries belonging to the OECD using data for the 1971–1999 period. The results indicate that, on average, total factor productivity growth, as well as the productivity of capital, are weaker in countries where government size is larger. The government size has a negative and statistically significant impact on economic growth. There is no systematic relationship between the magnitude of the growth impact of government and the size of government across these countries, so one might infer that the negative impact of government size could well reflect the effect of taxation and transfer payments.

The empirical results by Edward Hsieh and Kon Lai (1994)[28] based on G-7 countries for the period 1885-1987 suggest that the relationship between government spending

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[26] Bassanini, A. and Scarpetta, S. (2001). "The Driving Forces of Economic Growth: Panel Data Evidence For the OECD Countries," *OECD Economic Studies No. 33, 2001/II*
[27] Dar, A. A. and AmirKhalkhali, S. (2002). "Government size, factor accumulation, and economic growth: evidence from OECD countries," *Journal of Policy Modeling, 24, 679-692*
[28] Hsieh, E. and Lai, K. (1994). "Government Spending and Economic Growth: the G-7 Experience," *Applied Economics, Taylor and Francis Journals, vol. 26(5), pages 535-42, May*

and economic growth can vary significantly across time as well as across the major industrialized countries that presumably belong to the "growth club." No consistent evidence is found that government spending can increase per capita output growth. Neither is there consistent support for the negative argument. For most countries under study, public spending is found to contribute at best a small proportion to the growth of an economy.

However, there are studies whose conclusions are opposite to the ones cited above. In 1985 in a sample of 47 countries, Roger Kormendi and Philip Meguire[29] found no evidence that growth in the ratio of government consumption to output adversely affects economic growth.

In a recent study, Marta Pascual Sáez and Santiago Álvarez García[30] found that the relationship between government spending and economic growth can be positive or negative depending on the countries included in the sample, the period of estimation and the variables which reflect the size of the public sector. The results obtained, based on regressions and panel techniques, suggest that government spending is positively related with economic growth in the European Union countries.

Investigating 115 countries for the period 1960-1980, Rati Ram[31] concludes that 1) the overall impact of government size on growth is positive in almost all cases, 2) the marginal externality effect of government size is generally positive, 3) factor productivity in the government sector appears to be higher, at least in 1960s, 4) it is possible that the positive effect of government size on growth is stronger in lower income countries.

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[29] Kormendi, R. and Meguire, P. (1985). "Macroeconomic Determinants of Growth Cross-Country Evidence," *Journal of Monetary Economics 16, 141-163*

[30] Sáez, M. P. and García, S. A. (2006). "Government Spending and Economic Growth in the European Union Countries: An Empirical Approach", *University of Cantabria, Department of Economics; University of Oviedo, Department of Economics*

[31] Ram, R. (1986). "Government size and economic growth: a new framework and some evidence from cross-section and time-series data," *The American Economic Review, 76, 191-203*

Some researchers examine the impact of not only the size, but also the quality of government on economic growth. For example, a 2008 study by Arusha Cooray[32] investigates the role of the government in economic growth by extending the neo classical production function to incorporate two dimensions of the government – a size dimension and a quality dimension. The study comprises 51 developing countries on the period 1996-2003. The empirical results indicate that the size of the government has a positive but insignificant impact on growth, while the quality of the government has a significant and positive impact on economic growth. Hence, investing in the capacity for enhanced governance is a priority for the improved growth performance of the countries examined. A 10% rise in the public capital stock will lead to 1.7% increase in output per head over 7 years, and a one unit rise in the composite governance index increases output per head by 8.8% over 7 years. The results suggest that for developing economies that already allocate a considerable share of public resources to social services, further spending may not improve growth outcomes. Increases in the size of the government can impede growth due to the disincentive effects of taxes, increased rent seeking and the crowding out effect on private investment. The results indicate that good governance can improve growth outcomes.

Despite the opposing results and conclusions, in recent years, many more studies have concluded that the relationship between government spending and economic growth is negative. This literature has recently been the subject of meta-analysis by Nijkamp and Poot (2003)[33]. A sample of 93 published studies, yielding 123 meta-observations, is used in their study to examine the robustness of the evidence regarding the impact of fiscal policy on growth. The most commonly studied issue regarding the impact of fiscal policy on growth is the effect of overall government

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[32] Cooray, A. (2008). "Economic Growth and The Size And Quality Of The Government", *University of Tasmania*

[33] Nijkamp, P. and Poot, J. (2002). "Meta-analysis of the impact of fiscal policies on long-run growth," *Tinbergen Institute Discussion Paper, 02-028/3*

"size." Among the sample of studies, 29 percent of the 41 studies concluded that "big government" appeared to be detrimental to growth, as compared with 17 percent of studies that concluded that an increase in government size had a positive impact on growth. Consequently, more than one half of the studies were inconclusive.

Also, some severe methodological errors are documented to be present in studies that find a positive relationship between economic growth and government size. For example, a large government spending is also part of GDP, which means that GDP may grow just because government spending grows. Also, Keynesian models assume, rather than find, a positive impact of fiscal spending on economic growth (see Mitchell[34]). Some studies use central government expenditure ratio as a measure of the size of government, probably because this measure is available for more countries. However, as Gwartney, Holcombe and Lawson (1998)[35] report, this ratio can be highly misleading, because it can underestimate the size of government for countries where substantial activities are undertaken at lower levels of government, as for example in Nordic countries. Also, because of the fact that large differences in the size of government across countries included in the sample exist, there are some theoretical as well as methodological considerations about the robustness of results based on panel data.

In 1989, Jack Carr[36] and Bhanoji Rao[37] independently present a critical review of Ram's model and call for reexamination of his results. Carr reports that the valuing of government goods and services at cost makes it impossible to measure

[34] Mitchell, D. (2005). "The Impact of Government Spending on Economic Growth," *The Heritage Foundation, No. 1831*

[35] Gwartney, J., Lawson, R. and Holcombe, R. (1998). "The size and functions of government and economic growth," *Joint Economic Committee, Washington, D.C., April*

[36] Carr, J. (1989). "Government size and economic growth: a new framework and some evidence from cross-section and time-series data: Comment," *The American Economic Review, American Economic Association*, vol. 79(1), pages 267-71, March

[37] Rao, B. (1989). "Government size and economic growth: a new framework and some evidence from cross-section and time-series data: Comment," *The American Economic Review, American Economic Association, vol. 79(1), pages 272-80, March*

government productivity. The mislabeling of government intermediate goods as final goods induces a positive bias in the relationship between government size and economic growth. Consequently, empirical results showing a positive effect of government size on economic growth must be viewed with caution. Rao also concludes that the overall positive impact of government size, observed in cross-country regressions, may be biased due to specification problem. Also, in regard to the positive and relatively large impact identified in time-series regressions, the result is of limited significance since causation at best is bidirectional in a few countries, and there is little direct evidence to support the type of causation implied in the Ram model.

Most recent studies of the impact of government size on growth in the OECD/EU countries find the following conclusions. In a paper[38] published in January 2008, António Afonso and Davide Furceri analyze the effects in terms of size and volatility of government revenue and spending on growth in the OECD and EU countries. Using a panel regression for the OECD and EU countries over the period 1970-2004, they find that indirect taxes (size and volatility), social contributions (size and volatility), government consumption (size and volatility), subsidies (size) and government investment (volatility) have a sizeable, negative and statistically significant effect on growth. In particular, a percentage point increase in the share of total revenue in GDP would decrease output growth by 0.12 percentage points both for the OECD and the EU countries. For the OECD (EU) countries, an increase of one percentage point in the share of total expenditure to GDP would decrease growth by 0.13 (0.09) percentage points.

Andrea Bassanini, Stefano Scarpetta and Philip Hemmings (2001)[39] use multivariate growth regressions for 21 OECD countries over the 1971-1998 period. The empirical

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[38] Afonso, A. and Furceri, D. (2008). "Government Size, Composition, Volatility and Economic Growth," *Working Paper Series No 849, European Central Bank*
[39] Bassanini, A. and Scarpetta, S. (2001). "The Driving Forces of Economic Growth: Panel Data Evidence For the OECD Countries," *OECD Economic Studies No. 33, 2001/II*

evidence generally supports the notion that the overall involvement of government in the economy may reach levels that impede growth. The results suggest that for a given level of taxation, higher direct taxes lead to lower output per capita, while on the expenditure side, transfers as opposed to government consumption, and especially as opposed to government investment, could lead to lower output per capita.

Stefan Fölster & Magnus Henrekson (2000)[40] estimate that an increase of the government expenditure ratio by 10 percentage points is associated with a decrease in the growth rate on the order of 0.7–0.8 percentage points.

Some economists recognize that only certain types of government consumption and investment expenditure can raise the marginal productivity of the factors of production. Public expenditure, notably on physical infrastructure or human capital, can be growth-enhancing but the financing of such expenditures can be growth-retarding (because of disincentive effects). The overall impact depends on the trade-offs between the productivity of public expenditure and the distortionary effects of taxes.

According to Barro and Sala-i-Martin (1992)[41], expenditures are categorized as *productive* if they are included as arguments in private production functions, and *unproductive* if they are not. This categorization implies that productive expenditures have a direct effect upon the rate of economic growth but unproductive expenditures have an indirect or no effect. The issue of which expenditure items should be categorized as productive or unproductive is debatable.

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[40] Fölster, S. and Henrekson, M. (2000). " Growth Effects of Government Expenditure and Taxation in Rich Countries", *Working Paper Series in Economics and Finance 391, Stockholm School of Economics*
[41] Barro, R. and Sala-i-Martin, X. (1990). "Public Finance in Models of Economic Growth," *NBER Working Paper No. 3362*

Heitger[42] distinguishes between government consumption spending (which includes consumption of fixed assets, compensation of employees, net purchase of non-fixed goods and services, net payment of interests and royalties, etc.), which he claims has a negative impact on growth, and government investment spending (for example, schooling, infrastructure and R&D, capital formation), which he claims has a positive impact on growth.

Antony Davies[43] finds that for low-income countries, government consumption expenditures have a positive impact on the Human Development Index (HDI) from (virtually) 0% share of GDP onward. In contrast, government investment expenditures have a negative impact on the HDI until investment expenditures reach approximately 40% of GDP.

Using a cross-country sample of 72 countries from 1960 to 1985, Robert Barro[44] concludes that public consumption spending is systematically inversely related to growth and investment while public investment tends to be positively correlated with growth and private investment.

Transfer payments (such as Social Security payments, social assistance grants and subsidies) also bring with them the problem of rent seeking. Rent-seeking (or subsidy seeking) occurs when people attempt to enhance their wealth by trying to direct government benefits to themselves rather than by engaging in productive activity. Rent-seeking benefits the recipient of the rents, but it is a drain on the economy as a whole (Gwartney et al.[45]).

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[42] Heitger, B. (2001). "The Scope of Government and Its Impact on Economic Growth in OECD Countries," *Kiel Institute of World Economics; Kiel Working Paper No. 1034*
[43] Davies, A. (2008). "Human Development and the Optimal Size of Government," *Journal of Socioeconomics,* forthcoming
[44] Barro, R. (1989). "A Cross - Country Study of Growth, Saving and Government," *NBER Working Paper No. 2855*
[45] Gwartney, J., Lawson, R. and Holcombe, R. (1998). "The size and functions of government and economic growth," *Joint Economic Committee, Washington, D.C., April, pp. 6-7*

Theoretically, transfers and subsidies are likely to reduce economic growth. The increased availability of transfers and subsidies will increase the incentive of both businesses and organized interest groups to seek gains through government largess rather than increases in productivity. Since the direction of transfers is generally either from those with high income levels to those with lower levels of income, or from working people to retired people, they shift income away from people with high savings' rates and toward those who save less of their income. The predictable effects are a reduction in total savings, higher real interest rates and a decline in the rate of investment. In addition, if the growth in the transfer sector (and overall size of government) is financed with government borrowing, this too is likely to place upward pressure on interest rates and reduce the level of investment (Gwartney et al.[46]).

The evidence suggests that large transfer payments have negative consequences for growth. Richard K. Vedder and Lowell E. Gallaway[47] in 1995 report the following "a federal budget strategy of constraining spending growth below output growth, with particular attention paid to constraining transfer payments, would have positive effects on economic growth."

Diego Romero de Avila and Rolf Strauch[48] estimate a distributed lag model, which indicates that government consumption and transfers negatively affect growth rates of GDP per capita over the business cycle, while public investment has a positive impact, and provides robust evidence that distortionary taxation affects growth in the medium-term through its impact on the accumulation of private physical capital.

Some findings support the view that the growth of government in newly emerging nations and economies tends to increase output. "Presumably this reflects the

[46] Ibid, p. 7
[47] Gallaway, L. and Vedder, R. (1995). "The Impact of the Welfare State on the American Economy," *Joint Economic Committee Study, December*
[48] Romero de Avila, D. and Strauch, R. (2003). "Public Finances and Long-term Growth in Europe – evidence from a panel data analysis," *Working Paper Series No 246, European Central Bank*

reduction in transactions' costs and the improved environment for investment associated with a rule of law and enforceable property rights" (Richard K. Vedder and Lowell E. Gallaway[49]). However, a 2001 paper by Sanjeev Gupta, Luc Leruth, Luiz de Mello, and Shamit Chakravarti[50] finds that the size of government in transition countries is still large and the scope is inappropriate in many cases.

Marta Pascual Sáez and Santiago Álvarez García[51] study the impact not only of the size, but also of the scope of the government on economic growth. The study identifies several variables that determine the size and scope of the government – trade openness and degree of integration with the rest of the world, business and political cycles, demographics such as dependency ratio, budget institutions, preferences of taxpayers and voters, and the structure of government. They conclude that a change in the scope of the government affects the social marginal benefit of some programs, and hence, the overall marginal benefit of public spending. Also, a less distortionary tax system would decrease the marginal cost of raising funds. This would affect the optimal government size that maximizes economic growth. The authors conclude that more attention should be paid to rationalizing the scope of government in transition economies than to cutting expenditures per se.

Salvador Barrios and Andrea Schaechter[52] conclude that good fiscal governance can facilitate structural reforms and is beneficial for all dimensions of public finances.

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[49] Gallaway, L. and Vedder, R. (1995). "The Impact of the Welfare State on the American Economy," *Joint Economic Committee of Congress Study, Washington D.C., December, p. 15*

[50] Gupta, S., Leruth, L., Luiz de Mello, and Shamit Chakravarti. (2001). "Transition Economies: How Appropriate is the Size and Scope of Government?," *IMF Working Paper*

[51] Sáez, M. P. and García, S. A. (2006). "Government Spending and Economic Growth in the European Union Countries: An Empirical Approach", *University of Cantabria, Department of Economics; University of Oviedo, Department of Economics*

[52] Barrios, S. and Schaechter, A. (2008). "The Quality of Public Finances and Economic Growth," *Economic Papers 337, September*

The growth-maximizing level of government size

In 1989 Barro[53] laid the theoretical foundations of the BARS Curve showing that the relationship between government size and economic growth is expected to be positive in the countries where the government is below a certain threshold. When the government is sufficiently large, the relationship is expected to be negative. This is so because, as government grows, more and more resources are allocated by political rather than market forces, and this creates inefficiencies that are detrimental to economic growth. As government grows relative to the market sector, the law of diminishing returns begins operating. Public expenditures are increasingly channeled into less and less productive activities, and the government undertakes more activities for which it is ill-suited, which lead to negative returns and retardation of economic growth. This is likely to result when governments become involved in the provision of private goods—goods for which the consumption benefits accrue to the individual consumers. Goods like food, housing, medical service, and child care fall into this category. There is no reason to expect that governments will either allocate or provide such goods more efficiently than the market sector (Gwartney et al.[54]).

Scholarly research indicates that most industrialized countries are on the downward sloping portion of the BARS Curve. After the World War II, many countries have seen large increases in government as a share of GDP. Government involvement in the economy of a number of industrial countries was indeed minimal, with average public expenditure amounting to only 8.3 percent of GDP in 1870. Public expenditure in the industrial countries reached 44.8 percent of GDP on average in

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[53] Barro, R. (1989). "A Cross - Country Study of Growth, Saving and Government," *NBER Working Paper No. 2855*

[54] Gwartney, J., Lawson, R. and Holcombe, R. (1998). "The size and functions of government and economic growth," *Joint Economic Committee, Washington, D.C., April, p. 4*

1990, and by 1994, it had risen to 47.2 percent of GDP (Vito Tanzi and Ludger Schuknecht[55]).

James Gwartney, Robert Lawson, Randall Holcombe[56] add these categories of government spending for the USA that are considered to be the core functions of government - expenditures on the protection of persons and property, national defense and international affairs, infrastructure such as highways and sewage, sanitation, and environmental protection. The authors note that even these functions are contradictory because the private sector could undertake at least some of these activities without government involvement. Even so, results show that expenditures on these core functions of government have always been less than 20 percent of GDP in the USA. Since 1980, core function expenditures have been less than 15 percent of GDP. Also, the authors report that transfers and subsidies as a share of GDP have more than doubled in the USA since the 1960s. They have risen from 6.4 percent of GDP in the 1960s to 13.5 percent of GDP during the 1990s. Thus, transfers and subsidies consumed an additional 7.1 percent of GDP in the 1990s as compared with the 1960s.

Government expenditures were examined in the same way as for other developed countries - Canada, United Kingdom, Germany, Australia, and Sweden. The data indicate that in recent years the actual government expenditures on these core functions sum to between 9 percent and 14 percent of GDP. The core government expenditures in "big government" European economies like Sweden and Germany consume approximately the same share of the economy as in the United States. Finally, while data over a lengthy time were available for only the United States and Canada, in these two countries, expenditures on the core functions of government constituted a smaller share of GDP in the 1990s than was true for 1960. The authors

[55] Tanzi, V. and Schuknecht, L. (1996). "Reforming Government in Industrial Countries," *The Institute for Public-Private Partnerships*
[56] Gwartney, J., Lawson, R. and Holcombe, R. (1998). "The size and functions of government and economic growth," *Joint Economic Committee, Washington, D.C., April*

state that "the growth of expenditures in the core areas has contributed little to the rapid growth of government."

Some researchers use the theoretical framework of Barro (1989) based on endogenous growth model in order to estimate the optimal size of government that maximizes economic growth. According to the so-called Barro's rule, the government services are "optimally provided" when marginal product equals unity. Using the theoretical framework of Barro, Karras (1997)[57] develops an empirical methodology to investigate the role of government services in the process of economic growth. He examines the Barro Rule for 20 European countries and finds out that the optimal government size is 16 per cent (+/-3 percent) for the average European country.

Following the theoretical framework of Barro and the methodology of Karras, Burak Gunalp and Oguzhan C. Dincer[58] estimate the productivity of government services and the optimal government size for 20 transition countries based on annual data for the period 1990-2001. The optimal government size is estimated to be 17.3 percent (+/-3 percent) for the average transition country. Null hypothesis that government consumption is not productive is rejected in favor of the alternative that government services are conducive to production in transition countries.

In 1987, Philip Grossman[59] estimates that the 1983 level of government expenditures in the USA exceeds by 87 percent the level that would maximize private sector output. Reducing government from $491 billion to $263 billion and shifting the freed labor to the private sector would increase output from $1187 billion to $1451 billion.

[57] Karras, G. (1997). "On the Optimal Government Size in Europe: Theory and Empirical Evidence," *The Manchester School of Economic&Social Studies, Blackwell Publishing, vol. 65(3), pages 280-94, June*
[58] Gunalp, B. and Dincer, O. (2005). "The Optimal Government Size in Transition Countries," *Department of Economics, Hacettepe University Beytepe, Ankara and Department of Commerce, Massey University, Auckland*
[59] Grossman, P. (1987). "The optimal size of government," *Public Choice 53:131-147*

In a 1991 paper, Edgar Peden[60] studies the government's effects on productivity in the USA for the period 1929-1986. This analysis validates the classical supply-side paradigm and shows that maximum productivity growth occurs when government expenditures represent about 17- 20% of GNP, far less than the 35% which existed in 1986.

In 1994, Gerald Scully[61] concludes that in order to maximize economic growth in the USA, the average rate of federal, state and local taxes combined should be between 21.5 and 22.9% of GNP. A more recent paper[62] by Scully published in September 2008 shows that the growth-maximizing tax rate for the United States over the 1960–1990 period was an estimated 19.3 percent of GDP, so this is the optimal government size. During that time, however, federal, state and local governments consumed a much higher percentage of GDP, and the economy grew more slowly than it would have at the growth-maximizing level. The Scully model also shows that while the growth of real government consumption and investment expenditures contributed positively to American economic growth (unlike transfers and subsidies), these expenditures were about one-fifth as productive as real private capital (physical and human) accumulation (0.22 compared with 1.11 and 0.96, respectively). Thus, at the margin, a dollar of public expenditure ought to have five times the rate of return of a dollar of private investment to justify the marginal dollar's worth of taxation to pay for it.

Using Scully's method to estimate the optimal size of government in Canada, Johnny Chao and Herbert Grubel[63] find that the optimal rate of taxation and

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[60] Peden, E. (1991). "Productivity in the United States and its relationship to government activity: An analysis of 57 years, 1929-1986," *Public Choice 69: 153-173*

[61] Scully, G. (1994). "What is the optimal size of government in the US?," *National Center for Policy Analysis, Policy Report No. 188*

[62] Scully, G. (2008). "Optimal Taxation, Economic Growth and Income Inequality in the United States," *National Center for Policy Analysis, Policy Report No. 316*

[63] Chao, J. And Grubel, H. (1998). "Optimal Levels of Spending and Taxation in Canada," *The Fraser Institute, Vancouver*

government spending in Canada is about 34 percent. The econometric results show that every one percent change in the ratio of spending to national income results in a 0.74 percent increase in the rate of economic growth. The reduction in the spending ratio of 29 percent due to the movement to the optimal level results, therefore, in an increase in economic growth of 22 percent.

In September 1996, Vito Tanzi and Ludger Schuknecht[64] report that "taking 1960 as the benchmark, over the long run, total public expenditure could be reduced to, perhaps, less than 30 percent of GDP without sacrificing much in terms of social or economic objectives."

In a 1998 study on the American economy for the period 1947-1997, Richard K. Vedder and Lowell E. Gallaway[65] show that "the Curve peaks where federal government spending equals 17.45 percent of GDP." The size of state and local government that maximizes the growth rate in GDP is 11.42 percent, which means that the overall optimal government size is 28.87 percent of GDP.

In a recent study, Antony Davies[66] expands on the previous literature by (1) shifting the criterion for optimal government size from productivity to social welfare by employing the United Nations' Development Programme's Human Development Index (HDI) as the outcome variable, and (2) generalizing from single country studies by employing panel data techniques to a data set of 154 countries over the period 1975 through 2002. The results indicate that, over all countries, the estimated levels of government consumption and investment expenditures that are associated with maximal growth in per-capita RGDP are 8.5% and 6.2%, respectively. This implies an optimal level of government expenditures of 14.7%.

[64] Tanzi, V. and Schuknecht, L. (1996). "Reforming Government in Industrial Countries," *The Institute for Public-Private Partnerships, Finance & Development, p. 3*

[65] Vedder, R. and Gallaway, L. (1998). "Government Size and Economic Growth," *Joint Economic Committee, Washington D.C., p. 5*

[66] Davies, A. (2008). "Human Development and the Optimal Size of Government," *Journal of Socioeconomics*, forthcoming

Using general government expenditure ratio in a sample of 12 European countries for the 1950-1996 period, Primož Pevcin[67] reports the following: "the panel data estimates of the Armey Curve suggest that optimal size of government in the sample of 12 European countries is approximately between 36 and 42 percent of GDP, indicating that potential scope for reduction of government spending ratio is from approximately 19 to approximately 30 percent. However, given the fact that large differences in the size of government across countries included in the sample exist, some theoretical as well as methodological considerations about panel data estimation occurred. Consequently, separate time series data estimations are implemented, implying, on average, approximately 19 percent reduction in government spending ratio."

Using the endogenous growth model, Ernesto Rezk[68] (2005) finds out that the optimal government size in Argentina, measured as the average tax rate, is 30%.

Directorate-General for Economic and Financial Affairs, EC (2008)[69] cites Buti, Martinez-Mongay, Sekkat and van den Noord (2003)[70] who find that the maximum stabilizing size of government is lower for small open economies. Their model suggests a threshold of about 35% of GDP for small open economies and somewhat higher, or about 40% of GDP, for large open economies. According to the authors, a larger government sector helps stabilize output in case of demand shocks but would destabilize output in case of supply shocks, if the government size exceeds a certain threshold. They suggest that reducing the government size with the aim to eliminate distortions and encourage long-run growth is not necessarily detrimental for the functioning of automatic stabilizers.

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[67] Pevcin, P. (2004). "Does Optimal Size of Government Spending Exist?," *University of Ljubljana, p. 11*
[68] Rezk, E. (2005). "Public Expenditure and Optimal Government Size in an Endogenous Growth Model: An Analysis of the Argentine Case," *National University of La Plata*
[69] European Commission, Directorate-General for Economic and Financial Affairs (2008). "Public finances in EMU – 2008"
[70] Buti, M., C. Martinez-Mongay, C., K. Sekkat and P. van den Noord (2003), "'Macroeconomic policy and structural reform: A conflict between stabilisation and flexibility?," in: M. Buti (ed.) *Monetary and Fiscal Policies in EMU* (Cambridge University Press), pp. 187-210.

Although there has been a general trend toward increasing the government size during the last decades, there is a considerable cross-country variation in the size and scope of the government in different countries. An attempt to distinguish among various determinants of government sector growth is made by Pevcin[71]. He concludes that economic factors such as differences of the magnitude of government ownership of enterprises, shares of elderly and urban population, etc. are more important in explaining the variation in the size of consumption spending, whereas political, social and cultural factors are more important in explaining the variation in the size of transfer spending.

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[i] Mitchell, D. (2005). "The Impact of Government Spending on Economic Growth," *The Heritage Foundation, No. 1831*

[ii] Wahab, M. (2004). "Economic growth and government expenditure: evidence from a new test specification," *Applied Economics, 36, 2126–2127*

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[71] Pevcin, P. (2004). "Cross-country Differences in Government Sector Activities", *Zb. Rad. - Sveuc. u Rij„ Ekon. fak„ god. 22. Sv. 2, str. 41-59*