

The Size of Government Expenditure and the Rate of Economic Growth in Bulgaria

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Summary: This article analyses the relationship between government spending and the economic growth rate in the period 1990-2004 in Bulgaria. The Armeij curve is used as an analytical tool. The optimal rate of the spending /output ratio is calculated on the basis of that curve. The conclusion arrived at is that the current ratio of government spending to total output is above the optimal rate. Policy implication includes a gradual decrease in the government spending / output ratio and an increase in the efficiency of the government spending programs.

Key words: government expenditure, rate of economic growth, Armeij curve, structure of government expenditure by groups.

JEL: E62; H10.

The debate over the role of the government in the economy has lasted for many decades, dating back to the times of the predominantly laissez-faire and classical economy policies. However an agreement has

not yet been reached. In a historical and logical context, no government, or a state of anarchy in society, will lead to an extremely low productivity of the economic system. The establishment of government to protect private property rights in legislation significantly boosts economic progress in society. However, this has proved insufficient. The Great Depression and the "General Theory of Employment, Interest and Money" radically change the economic thought and reasoning. Keynes' belief that "the biggest mistake of economic society, in which we live, is its incapability to ensure full employment, as well as the random and unfair distribution of wealth and income" (1, 1993, c.428) has become the driving force of the economic policy and has set the scene for regulation of the economy. Unemployment assumes the dimensions of a problem of society rather than of the individual. Not only has government played the role of "a knight guard", but it has also significantly broadened its area of activities – "the centralized control to achieve full employment will certainly require a large expansion of the traditional functions of government" (1, 1993, c.437). Conducting such a policy in most industrial countries has led to an unprecedented increase in the public sector in the '60s and '70s – a process which continued up to the mid '90s (see table 1).

At the same time the practice in Russia and the CEE countries up to 1990 convincingly showed that, in an environment of state monopoly of production and a centralized allocation of the

resources, societies cannot provide for a stable long-term economic growth. Consequently, sooner or later the countries with command economy lapsed into a deep and comprehensive system crisis. Drawing upon historic experience, it can be undoubtedly concluded that both little government and too big government do not insure maximization of the economic welfare. Logically, a natural question arises: What level of government intervention would lead to this maximization? Is it necessary to decrease the ratio of government expenditure to GDP, or should it increase, and to what level, if the purpose is to increase the total output of the economy?

The logical answer to the above question is that neither the total government, nor the lack of government leads to maximization of the social welfare. In other words, a certain combination of the free market forces and government decisions, concerning the allocation of resources, is needed. Mixed economy has been the object of analysis in several studies. Its advantages over the pure market economy or the pure state-controlled economy in terms of the economic efficiency are indisputable. One of the most interesting questions, which continue to be the focus of attention in economic research, concerns the level of state intervention in the economy.

Over the last years it has been increasingly argued that the effective level of government interference in the market mechanisms has been exceeded. Himself being a proponent of government regulation, Keynes assumed the excessive government interference in economic life and thought. He claimed that only economic practice would answer the question about the optimal level of state intervention – “we must admit that only experience can show to what degree the public will, integrated in the government policy, should be directed to increasing and complementing the investment incentives and how safe it is to stimulate

the average propensity to consume without depreciating the value of the scarce capital over one or two generations” (1, 1993, c.434).

A period of seventy years is long enough to reassess the role of government in economic life both from a theoretical and practical point of view. Theoretically, the necessity of restricting government intervention is supported by monetarists, neo-classicists, real business cycle economists and supply siders. A group of economists, emerging after 1990 under the name of “non-Keynesian effects” of the macroeconomic policy, held the view that in some cases even fiscal consolidation might stimulate the economy.

The economies of some new industrialized countries (Korea, Thailand, Taiwan, Singapore, Hong Kong, Malaysia), with a limited public sector and a more dynamic growth, stand out against the background of economies of most industrially developed European countries with a strong government intervention, growing budget deficits and levels of national debt, and economic growth rates. A country aiming to overcome its economic underdevelopment needs foreign investment. But nowadays, in

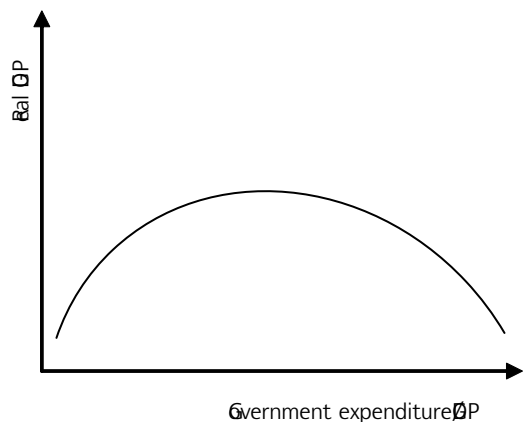


Figure 1. Government expenditure and GDP
(The Armeij curve)

an environment of globalization, competition on the international financial markets has been enhanced. Foreign investors prefer countries with low taxes, less government spending and a more liberal economy. Ireland provides a good example of a country, which has successfully attracted a significant amount of foreign investment, thus amazingly improving its economic development. At the same time, it is the country with the lowest ratio of government expenditure to GDP in the EU (see table 1). Awareness of such trends presupposes a reconsideration of the degree of redistribution of GDP by the government.

Economic theory offers different methods and instruments for evaluating the role of the government in the economic process¹. One of

these instruments (relatively new) is the Armeij curve (5, 1995). The Armeij curve is based on the fundamental law of diminishing factor returns. It is illustrated on Figure 1.

The curve, showing the ratio of government participation in the economy (measured by the government expenditure/GDP ratio) and real GDP (or the growth rates of the real GDP), suggests the idea that without government a very low output is being produced (theoretically, it can be zero). The increase in government spending leads to higher GDP, faster at the beginning, slower after that, and reaching the maximum output (or maximum growth rate) at a certain level of government spending. After this point, a further increase in government

Table 1. Government expenditure as a per cent of GDP for EU-15

	1960	1970	1980	1990	1996	2001	Increase 1960-2001
Belgium	34.5	36.5	50.7	54.6	54.5	49.4	14.9
Denmark	24.8	40.2	56.2	58.6	60.8	55.3	30.5
Germany	32.4	38.6	48.3	45.7	56.0	48.3	15.9
Greece	17.4	22.4	30.5	49.6	49.4	47.8	30.4
Spain	13.7	22.2	32.9	43.0	45.4	39.5	25.8
France	34.6	38.9	46.1	49.9	54.7	52.5	17.9
Ireland	28.0	39.6	50.8	40.9	37.7	33.9	5.9
Italy	30.1	34.2	41.9	53.8	52.7	48.5	18.4
Luxembourg	30.5	33.1	54.8	45.5	49.3	39.0	8.5
Holland	33.7	46.0	57.5	57.5	58.1	46.6	12.9
Austria	35.7	39.2	48.9	49.3	52.7	51.9	16.2
Portugal	17.0	21.6	25.9	41.9	46.0	46.3	29.3
Finland	26.6	31.3	36.6	46.8	59.4	49.1	22.5
Sweden	31.0	43.7	61.6	60.8	66.1	57.1	26.1
England	32.2	39.2	44.9	42.3	43.7	40.2	8
Average	28.1	35.1	45.8	49.3	52.4	47	18.9
Standart deviation	7	7.7	10.5	6.4	7.4	6.4	

Source: OECD, *Economic Outlook*, December 2002.

¹ For example: Basing her thesis on a descriptive analysis of government spending, V. Pirimova reveals its influence on the growth rate and evaluates the efficiency of the fiscal policy (3, 2001,c.49-75).

spending leads to a decrease in the output (or slowing down of the growth rate). It is here where the law of diminishing returns applies. The new government expenditure requires raising taxes, which serves as a disincentive for economic agents. In small amounts, transfer payments to the poor do not affect negatively their economic behavior. As they grow larger, they result in stronger work disincentive effects.

Consequently, after a certain level, each additional unit of government spending diminishes growth rates, and, at a later stage, decreases output. A very popular practical rule, establishing the possible effective levels of the "government expenditure/GDP" ratio, is Milton Friedman's statement: "Government has an essential role to play in a free and open society. Its average contribution is positive; but I believe that the marginal contribution of going from 15 % of the national income to 50 % has been negative..." (7, 1997, c.14). In other words, according to Friedman, the optimal threshold of government expenditure to GDP is somewhere between 15 % and 50 %.

A survey of the government expenditure/GDP ratio in some of the most industrially developed countries shows that not all of them can be classified in the aforementioned Friedman's range – some of the countries surpass the upper level.

What stands out as a tendency during this 40-year period is a considerable increase in the share of government spending in GDP (an average increase of 19 % for all countries). In Ireland, Luxembourg and England the increase amounts to 10-15 % under the average, in Denmark, Greece and Portugal it is the most significant – about 10 % above the average. This trend of growing ratio in all countries continues up to the mid 1990s. Thereafter, a certain decrease can be noticed in most of

the countries. In 2001 the highest percent belongs to Sweden, Denmark and France, and the lowest – to Ireland, 33,9 %.

Spain is the one with the lowest government expenditure/GDP ratio for the whole represented period -13 % in 1960. On the other hand Sweden has the highest – 66 % in 1996. Furthermore, in 2001 compared to 1960 the standard deviation decreases. This means that a considerable drawing closer between the countries is observed on this indicator. A drawing closer is also seen in the decrease in the relation between the country with the highest and the one with the lowest per cent of government expenditure/GDP ratio. In the year 1960 it is 2,6 times (Austria – 35,7 % , and Spain -13,7 %), and in 2001 – 1,6 times (Sweden – 57,1 % , and Ireland – 33,9 %).

For the last 5 years the decrease in the Scandinavian countries has been most significant – for Finland it is by 10,3 percentage points, for Sweden – by 9 percentage points, but they, especially Sweden, still remains among the countries with a high government expenditure/GDP ratio. So there are no countries with a government expenditure/GDP ratio over 50 % until 1960. In 2001 in spite of the declining trend outlined after 1996, 4 countries (Denmark, France, Austria, and Sweden) kept their over the 50 % frontier, which as mentioned before, could be taken for an upper limit of the practical rule concerning the best government expenditure/GDP ratio.

Empirical studies on the basis of the Armeij curve for other countries also show that in many of them the optimal amount of the government expenditure is rather surpassed. R. Vedder and E. Gallway surveyed a 200 year period in the USA and found that the optimal size of a government that maximizes the economic growth was 13.42 %, and the government spending/GDP ratio, maximizing

GDP was 17.45 %. This is considerably lower than the actual size of government spending which is 33.3 % of the GDP in 1996 (14, 1998, p.5-9). P. Grossman considers the optimal size for USA to be 20 % of the GNP (9, 1987, p.193). G. Scully (12, 1994) specifies the optimal tax rate in the USA as 23 % and in 1994 it increases by 14 percentage points that leads to lowering of the growth rate by about 2 percentage points, compared to the optimal one. According to J. Chao and H. Grubel the optimal size of the government expenditure in the Canadian economy is 27 %, which is 20 percentage points less than the actual one. (6, 1998, p.68). In his research concerning some of the countries in the European Community, P.Pevcin comes to the next few rates of the optimal size of government expenditure: Italy-37,09 %; France-42,90 %; Finland-38,98 %; Sweden-45,96 %; Germany-38,45 %; Holland-44,86 % (11, 2004, p.10). Using a method, based on the analysis of the relationship among government spending, taxes and some other macroeconomic indicators, V. Tanzy and L. Schuknecht study a wide range of countries with different levels of socio-economic development and determine the optimal level of government spending in the scope between 20 % and 40 % of GDP. The level of 30 % is accepted as the tentative limit (13, 1998, p.69-92).

Given the data, one can conclude that there is not (and cannot be) a unique optimal size of government expenditure in the economy.

Every country has its own optimal level which depends on a number of factors and conditions such as the level of economic development, the level of permanency and effectiveness of the institutions of the market economy, the effectiveness of the public sector and the state administration and population preferences .

How does the relationship between government expenditure and growth rates in Bulgaria look like for the last 15 years? Figure 2 shows the dynamics of government expenditure (as a % of GDP) and the growth rate of real GDP for the 1990-2004 period. Two tendencies stand out: the first one presents a considerable reduction in the government expenditure/GDP ratio from 61,7 % in the beginning of the period to 40 % in its end; the second tendency reveals an increase in the growth rates, which in 1997 transform themselves from negative to positive. Regression analysis is needed for the evaluation of the proper relationship between the two variables.

The relationship between the government expenditure/GDP ratio and the rates of growth can be estimated by a simple regression:

$$T = a_1 + a_2G \tag{1}$$

Where:

- T – Rate of growth of real GDP;
- G – Government expenditure/GDP ratio

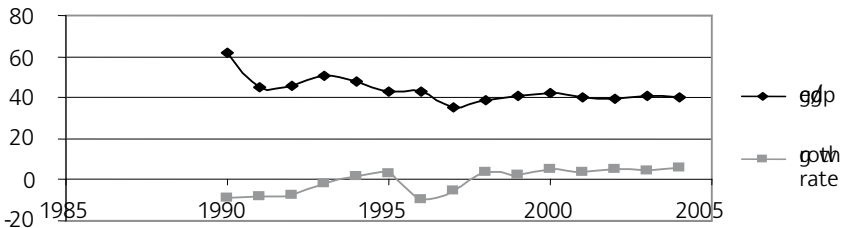


Figure 2. Dynamics of government expenditure (% of GDP) and rate of growth of GDP, 1990-2004

Table 2. Results of estimating equation 1

Variable	Regression coefficient	t-Statistic
Constant	a1 = 18.9	1.9
G	a2 = -0.44	-1.96
R2 = 0.23; DW – statistic = 1.09; F-Statistic = 3.8.		

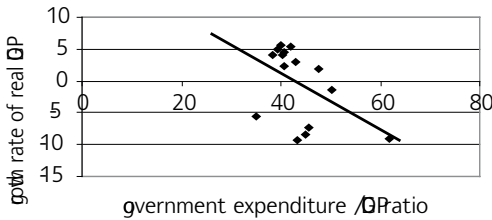


Figure 3. The relationship between government expenditures and growth rates, 1990-2004

The results of the estimation of the equation 1 on the basis of regression analysis using ordinary least squares are shown in Table 2.

Figure 3 considers the negative relationship between the size of government and the real GDP growth.

Using a simple linear regression reveals the negative relationship between the investigated variables: a decreasing government expenditure/GDP ratio leads to an increasing growth rate – more concrete, one percentage point decrease of G leads to an increase in the growth rate with 0.44 percentage points. But as it has been theoretically proved, the link between government expenditure and growth rates is of a non-linear rather than linear nature. The regression equation from table 2 just shows that up to the present the respective country has exceeded the optimal amount of the government expenditure and is

located in the part sloping downward of the Armeij curve. In this sense reduction of the government expenditure to a certain level can increase growth rates. In order to find this optimal size, it is necessary to represent the Armeij curve in non-linear form as a concave function.

The empirical test for the existence of the Armeij curve can be done on the basis of a mathematical model:

$$Q = f(G, N) \tag{2}$$

where Q measures the final result of the functioning of the economy, G indicates the government participation in the economy, and N – the possible factors.

The most suitable indicator for Q is the rate of growth of GDP² and for G – the government expenditure/GDP ratio. If the other factors are not considered, in order to represent theoretical relationship, shown on figure 1, more appropriately, the quadratic function is the best way:

$$T = a_1 + a_2G - a_3G^2 \tag{3}$$

The statistical results from the estimation of equation 3 by using the regression analysis on the basis of the least squares method are shown in table 3.

Table 3. Results of the estimation of equation 3

Variable	Regression coefficient	t-Statistic
G	a ₂ = 0.36	1.85
G ²	a ₃ = -0.0084	-1.96
R ² = 0.24; DW – Statistic = 1.1		
T = 0.6G – 0.0084G ² (3)		

² Real GDP can also be used.

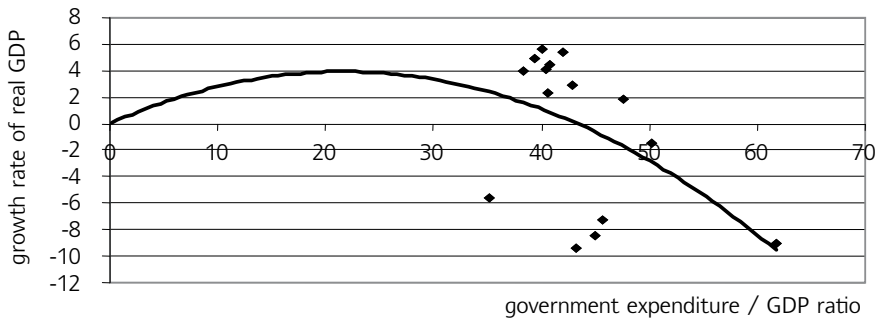


Figure 4. Armeij curve, 1990-2004 period

All independent variables are statistically significant at 10 % level. From the results it can be assessed, following the Armeij curve (drawn on figure 4), where the level of GDP produced is maximized. Solving of equation 3 as a function, which should be maximized leads to finding the optimal size of the government expenditure/GDP ratio, or $G = 21.42\%$.

The result means, that if the government expenditure/GDP ratio has been 21.42 % during the former period, the maximum possible growth rate would be 3.9% on average per year. Had this happened, the real GDP produced during 2004 would have been 62 % larger than the actual GDP.

The resulting estimate for the optimal size of the government expenditure of Bulgaria should not be regarded as an absolute value.

First, it is known that the more observations we have, the more reliable results we get from an econometric model. The period, analyzed in the article, is relatively short. From this point of view the final result can be changed after adding or subtracting one or two years of the estimated period³.

Secondly, certain differences in the estimate of the optimal size of the government expenditure result from the specification of the regression too – with or without intercept. From a purely theoretical perspective, it is more logical to assume that even without government and the ongoing costs, it is possible that some level of GDP will be produced. That hypothesis is presented by a regression with intercept. In that case, the optimal size of government expenditure is 28 %⁴.

Thirdly, government expenditure is not the only factor affecting the growth rate. Having this in mind an inclusion of additional factors such as foreign investments, taxes and inflation improves the explanatory power of the regression model. However, our goal is not to find a model of the economic growth, but to check if there is a non-linear relationship between government expenditure and growth rate. In other words, to verify the existence of the Armeij curve in Bulgaria and to show that optimal frontier has been exceeded.

The conclusions from the econometric model can be additionally defined by an analysis of the structure of the government expenditure by groups and the relationship among the different

³ For example, 2 years smaller period increase optimal size to 22,5 % and 3 years – to 25%. The same result is possible under increasing the period. Besides that the low number of observation are not appropriate to check for stationarity.

⁴ The coefficients of regression with intercept are statistically insignificant at 10 % level.

kinds of expenditure and the rate of economic growth.

The dynamics of the basic kind of expenditure in the structure of the consolidated state budget in Bulgaria for the 1990-2003 period is shown on figure 5.

The following tendencies outline the directions of government expenditure policy during the last few years.

1. As a whole, the structure of government expenditure of the consolidated state budget is subject to numerous variations, expressed in terms of considerable differences between the maximum and minimum value of the percentage ratio of the different kinds of expenditure to GDP. For the majority of the budget items, the variations are clearly visible in the maximum, exceeding the minimum about twice (see table 4, last column).

2. The defense and safety expenditures, which are about 5,2% of GDP, are relatively constant. The ratio between the maximum and the minimum values of these expenditures is 1.36 times. This kind of expenditure is hard to comment as there are a number of questions concerning the national security and which results directly from Bulgaria's NATO

membership. Nonetheless, a comparison with the EU-15's countries could be an indicator⁵. The average defense and safety spending in the EU-15 is 3.5%. The highest ones are in UK and Greece – respectively 4.5% and 4%, while in many countries the percentage is below 3% of GDP: Italy (3%), Denmark (2.7%), Belgium (2.8%) and Ireland (2.2%). The figures for the last country are extremely suitable to our purposes because in the last few years it has the most dynamic growth rates. An interesting fact is that in Ireland most of these expenditures are in the field of public order and safety. Taking in mind that comparison, we can say that defence and safety spending in Bulgaria seems to be too high and that it can be optimized according to the economic potential of the country.

3. The highest fluctuations are in the category "other expenditures" with a ratio of 9.2 times between the maximum and the minimum value. That could be explained easily as the basic component of that category is "interest". The basic interest rate dropped dramatically after the start of the Currency board – from 216% in March 1997 to below 3% in the end of 2003 and 2004. Simultaneously, the interest payments on the internal debt of the government decreased.

4. The education and health expenditures

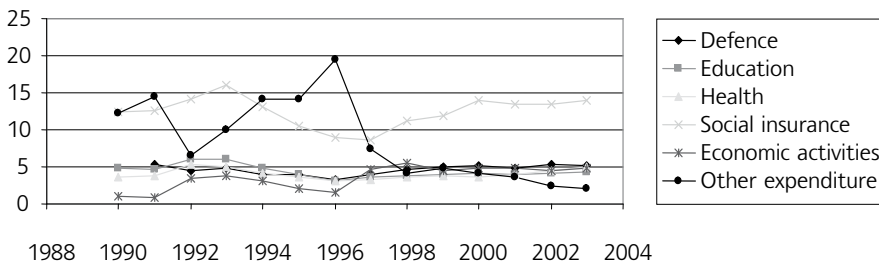


Figure 5. Dynamics of expenditure of consolidated state budget as a percent of GDP

⁵ All EU data are for 2001 and are taken from: Gilles, Revelin. Government expenditure by main function: EU countries compared. Economy and Finance, theme 2 – 54/2003.

Table 4. The structure of expenditure of consolidated state, 1991 – 2003

	Government expenditure as a per cent of GDP				
	At the beginning of the period	At the end of the period	Minimal value	Maximal value	Max/Min Ratio
Total	44.9	40.7	35.1	50.2	
General public services	2*	3.2	1.3	3.8	2.9
Defense and safety	5.3	5.2	3.9	5.3	1.36
Education	4.7	4.4	3.2	6.10	1.9
Healthcare services	3.8	4.9	3.1	5.4	1.74
Social security	12.7	13.9	8.6	16	1.86
Housing, public utilities and protection of the environment	1,5*	1.4	0.8	1.8	2.25
Recreational, cultural and religious affairs	0.9*	0.8	0.5	0.9	1.8
Economic activities and services	0.9	4.8	0.9	5.5	6.1
Other expenditure	14.4	2.1	2.1	19.5	9.2

Source: own calculations using data from "Statistical yearbook of the Republic of Bulgaria, 1992-2004. *1993 data

come up to 4.4 % and 4.9 % of the GDP respectively. According to L. Yotova (2, 2003, p.90), "these levels, in comparison with those in other European countries, can be characterized as low". We can agree, to some extent, with that opinion, as far as these values are below the average levels of the EU-15 – 5.1 % and 6.3 % respectively. At the same time, we should consider that some countries have similar to our levels of education expenditure: UK – 4.6 %, Germany – 4.2 %, Spain – 4.3 %, Ireland – 4.3 %, only Greece has a considerably lower level – 3.8 %. As far as health services are concerned, most of the countries make expenditures that are with 1 percentage point higher than the Bulgarian ones. Only Greece and the Netherlands have lower percentage levels of this type of spending.

5. The highest share in the total spending belongs to the field of social security. These expenditures grow modestly during the examined period: with 1.5 percentage points and they reach 13.9 % of

GDP at the end of the period. These expenditures are considerably lower in Bulgaria than in the EU countries, where the average level is 18.8 % of GDP. In some countries like Denmark, Sweden, Germany, Finland and France that spending is over 20 % of GDP. Taking into account the fact that those countries undertake serious reforms in the social security system, which aims at decreasing spending and improving efficiency, we could assume that those levels of present spending in Bulgaria are reasonable.

The analysis of the structure of the budget expenditure, compared to that of the EU, reveals important trends, but the basic conclusion is that the differences rather than similarities prevail in the EU countries. Therefore, a specific uniform structure of budget items cannot and should not exist. The answer of the question whether in Bulgaria there is an Armey curve relationship in all categories of spending or whether there is a negative or positive one for some of them is what really matters.

Table 5. Regression results: the relationship between the expenditure of the consolidated state budget by groups and the growth rate, 1991-2003

Expenditure groups	Linear relationship	Armey curve	Optimal rate
General public services	Positive*	No	
Education		Yes**	4.6
Healthcare services		Yes***	4.3
Social security		Yes*	13.6
Economic activities and services	Positive **	No	
Other expenditure	Negative**	No	

*Note: * – at 10% level; ** – at 5% level; *** – at 1% level.*

To this effect equation 3 is estimated as variable G takes the form of different categories of budget spending. The analysis includes all of the basic expenditure items – general public services, education, health services, social security, economic activities and services and other expenditure. The results from the regression analysis are summarized in table 5.

The regression analysis defines the existence of an Armey curve in the following groups of expenditure: social insurance, education and health services. On that basis the optimal levels for these three groups can be calculated (last column of table 5). Compared to actual values for 2003, an exceeding of 0.7 percentage points over the optimum is seen. The other three types of spending, the relationship of which to growth rate is statistically significant, are as follows: “general public services”, “economic activities and services” and “other expenditure”. For these, however, the relationship is linear, for the first two groups it is positive and for the last group – negative. That means that the increase in the first two types of expenditure has a positive impact on the growth, whereas the positive effect of the “other expenditure” comes from its decrease. Taking in mind the lowest value of 2.1% from GDP reached in 2003, for the whole period of transition we can hardly expect a further decrease in this indicator

of over one percentage point.

On the basis of the analysis in this paper it can be said that during the last years in the industrially developed countries a tendency towards a contracted the public sector is observed. Bulgaria, which is undergoing the fundamental transformation of its economic system, is confronted with the problem of reducing state participation in its economy. Economists apply different techniques in searching for the optimal amount of government expenditure. The Armey curve based on the non-linear relationship between government expenditure/GDP ratio and the growth rate is useful tool in determining the best solution. The optimal size of government expenditure in Bulgaria, based on the curve for the period 1990-2004, is around 22% of GDP in regression without intercept and 28% in the case with intercept. The same approach applied to the main categories of budget expenditure gives a more adequate figure of 28%. Finally, a conclusion can be drawn that the present ratio of government expenditure to GDP of 40% has to be gradually declining in future.

Accelerating or maintaining the growth rates of the last few years will allow for increasing in the absolute amount of the government expenditure, whilst retaining the basic government functions, even if the government expenditure/GDP ratio

decreases. Undoubtedly the enhanced spending efficiency⁶ will be the main factor determining the successful implementation of such a strategy.

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⁶ The low return of the government spending programs in the specific Bulgarian political environment is among the most important factors, which force the need of their relative limitation.