

## **ДАНЪЧНА СТРУКТУРА НА БЪЛГАРИЯ**

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### **TAX STRUCTURE OF BULGARIA**

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#### ***Abstract***

*The article analyzes Bulgaria's tax system and the link between consumer tax system with economic growth. The article have analized the tax revenue types of Bulgaria and their impact on the economy. The paper has a goal to present some types of expenditure. It has analyzed the link between expenditure and GDP per capita. For the empirical analysis, a linear regression model was used in the form of the Least Squares Method (LSM). On this basis, the state's redistributive function was assessed as a burden of taxation. The survey covers the time period 1999-2015. The variable used are: government expenditure, tax revenues, GDP per capita, revenues from VAT, excise, duty, income taxes, capital and dividend taxes.*

**Key words:** *tax structure, direct taxes, indirect taxes, government revenue, expenditure*

**JEL Codes:** *H34, H25, H63*

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#### **INTRODUCTION**

Taxes and the tax system have always been at the heart of the disagreements surrounding the county's financial policy. Each country determines the types of taxes, the tax rates, the order and methods of taxation appropriate for it. The main goal is to optimize direct and indirect taxation. Achieved optimality leads to higher economic growth and higher personal wealth. According to Ganchev (2009), the problem of optimal taxation is not limited to the problems of redistribution. It is related to the production and supply of so-called public goods.

Taxation has past through different stages from Old World to the Modern World. Currently, taxation is a mandatory component of each country's policy. Without it the state could not carry out its functions.

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Many economists write about taxation, it is subject to many research and analysis. According to Moloko (2004) taxation is the main function to the country. It is a major regulator in economic, legal and foreign policy. The opinion of Baytin (1998) on this subject overlaps with that of Moloko. But according to Baytin taxation is the part of the economic and organizational functions of the country. I.e. without the existence of a stable tax system, the country could not participate in the organization and control of economic activities.

This article analyzes Bulgaria's tax system, which is a consumer type. The aim of the article is to reflect the link between the tax system and economic growth in Bulgaria. The redistributive function of the state, broken down through the prism of the consumer tax system. In an analysis for Bulgaria of Tanchev (2016) it is found that the redistribution in the budget has decreased as a result of the adoption of the proportional income tax. As a result of this change, the country has switched to a tax system of a consumer type. Therefore, government revenues are mainly dependent on consumption taxes.

In a research, Marlow (1988) proves that government expenditure are limited by the fiscal program. He argues that the amount of tax law, inflationary impact, and government debt determine the size of the public sector and state intervention.

Madsen and Damania (1986) studied the development of the economies caused by the reduction in direct taxes and the increase of indirect taxes in OECD countries over the period 1960-1990. They have empirically confirmed that budget revenues are not increased when revenues are largely dependent on consumption. In long term a negative effect on economic growth has been established.

Tanchev (2016) examines the income from direct and indirect taxes in the budget of Bulgaria during economic growth and crisis in conditions of consumer tax structure. It comes to the conclusion that in times of economic growth the revenues from consumption taxes form the necessary revenues in the budget. In a period of crisis, a tax structure that relies primarily on consumption taxes is unable to provide the necessary revenue in the budget.

The statistic shows that Bulgaria is on the list of poor countries in the European Union. Most of Bulgaria's tax revenues acquire from indirect taxes. Auerbach (2006) defines indirect taxes as taxes on consumption. Auerbach believes that consumer taxes improve the trade balance because they cover more economic activities. In an article of Xing (2011), he has found that more

countries reform their tax system, as they restructure their government revenue from income taxes to consumption taxes.

Macek in analyses (2014) of the OECD countries proves that taxes on consumption have a positive impact on the dynamics of economic growth.

Gordon and Li (2005) claim that the main income source of the wealthy countries is the personal income tax between 42.7% and 54.3%. For the poorer countries, consumption taxes are the main ones, which manage to generate about 51.2% of tax revenues.

## ANALYSIS AND DISCUSSION

The main tax revenues in Bulgaria are presented in Table 1. The table outlines the consumer tax system in Bulgaria. The main revenue from direct taxes are from income taxes. Most revenue from indirect taxes is collected from VAT.

*Table 1. Main tax revenue in Bulgaria*

Country	VAT	Duties	Excise	Other taxes	Income tax	Capital tax	Dividend tax	Total amount of tax revenue
Bulgaria	8.98	0.38	4.36	0.12	5.48	0.25	0.25	20.73

*Source:* The author

In the preparation of empirical analysis statistics, the necessary condition is the application of a seasonal adjustment procedure for the time series when monthly or quarterly data are used. Removing the trend and smoothing the rows was done with the Seasonal adjustment (Census X12).

After smoothing the rows, a single root (non-stationarity) check was performed at a pre-set error probability level of 5%. Used is the advanced Augmented Dickey-Fuller's Test (1979). The results of the application show the following results:

The article shows the extent to which consumption taxes and income taxes influence on government revenues and expenditures. It has been showed from four equations that are visualized through tables. The data used are on a quarterly basis and cover the period from the first quarter of 1999 to the fourth

quarter of 2015. For the Table 6 and Table 7, the data used are on an annual basis and cover the period from 1999 to 2012.

There is a unit root in the variables of revenue from taxes on income, capital, dividend (see Appendix A1). There is not a unit root in the variables of revenue from taxes on excise duties and VAT, as in government expenditure, government revenues. Appendix A2 presents the unit root of GDP per capita test that detects non-stationarity in the variable.

Appendices B1, B2 and B3 have showed the cointegration between government revenue, expenditure, GDP per capita and direct taxes in Bulgaria. Alternative hypothesis for existence cointegration has accepted for government revenue and revenue from taxes on capital, dividend and income and for GDP per capita and revenue from taxes on capital, dividend and income. Null hypothesis has accepted for lack of cointegration for government expenditure and revenue from taxes on capital, dividend and income.

The regression equations used for the analysis are six, so six Ramsey tests had also performed (see Appendix C1-C6). For each of them the linear form of dependence is correct:

- In the linear equation with dependent variable government revenue and independent – revenue from taxes on duty, excise and VAT-  
 $R^2 = 0.334981 < 0.689679 = R^2$  of the Ramsey test

- In the linear equation with dependent variable government revenue and independent – revenue from taxes on capital, dividend and income-  
 $R^2 = 0.564899 < 0.623451 = R^2$  of the Ramsey test

- In the linear equation with dependent variable government expenditure and independent – revenue from taxes on duty, excise and VAT-  
 $R^2 = 0.177731 < 0.259401 = R^2$  of the Ramsey test

- In the linear equation with dependent variable government expenditure and independent – revenue from taxes on capital, dividend and income-  
 $R^2 = 0.578565 < 0.660197 = R^2$  of the Ramsey test

- In the linear equation with dependent variable GDP per capita and independent – revenue from taxes on duty, excise and VAT-  
 $R^2 = 0.856878 < 0.875147 = R^2$  of the Ramsey test

- In the linear equation with dependent variable GDP per capita and independent — revenue from taxes on capital, dividend and income-  
 $R^2 = 0.960856 < 0.967905 = R^2$  of the Ramsey test

The linear equation takes the following standard form:

$$y_t = b_0 + b_1 + b_2 + b_3 + \varepsilon_t$$

Where:

$y_t$  – GDP per capita

$b_0$ – constant

$b_1$  - independent variable 1

$b_2$  - independent variable 2

$b_3$  - independent variable 3

$\varepsilon_t$ - residue vectors

There is a straightforward link between revenues from customs duties (0.3687431) and VAT (0.857942). This means that a unit increase in revenues from customs duties and VAT could lead to an increase in government revenue. The negative rate of excise revenue (-3.892644) suggests that a decrease in these would result in a decrease in total revenue (See Table 2).

Table 2. Dependent variable: revenue

Variable	Coefficient	Standard Error	T-statistic	Probability
<b>Constant</b>	30.68219	5.346446	5.738802	0,0000
<b>Duty</b>	3.687431	1.330327	2.771823	0.0072
<b>Excise</b>	-3.892644	1.690220	-2.303039	0.0244
<b>VAT</b>	0.857942	1.124598	0.762887	0.4482
R-squared	0.125895	Mean dependent var	37.90857	
Adjusted R-squared	0.086163	S.D. dependent var	4.805937	
S.E. of regression	4.594227	Akaike info criterion	5.942923	
Sum squared resid	1393.057	Schwarz criterion	6.071409	
Log likelihood	-204.0023	Hannan-Quinn criter.	5.993959	
F-statistic	3.168596	Durbin-Watson stat	1.469796	
Prob(F-statistic)	0.030008			

Source: The author

Table 3 aims to show the relation between government revenue and the three types of direct taxes. There is a straightforward link between revenue and revenue from income tax (2.248770). This is the highest coefficient of the three variables examined, indicating that the dependence is strongest. Increasing taxes

on income leads to an increase in the total amount of tax revenue. Significantly weaker, but again proportional to the revenue from tax on dividends (0.139808). The inverse relationship between government revenue and capital duty (-0.297549) implies that an increase in this tax leads to a decrease in revenues.

Table 3. Dependent variable: revenue

Variable	Coefficient	Standard Error	T-statistic	Probability
<b>Constant</b>	24.92494	1.519352	16.40498	0.0000
<b>Capital</b>	-0.297549	2.747884	-0.108283	0.9141
<b>Dividend</b>	0.139808	0.328129	1.426075	0.0674
<b>Income</b>	2.248770	0.207164	10.85502	0.0000
R-squared	0.649054	Mean dependent var	37.90857	
Adjusted R-squared	0.633102	S.D. dependent var	4.805937	
S.E. of regression	2.911058	Akaike info criterion	5.030355	
Sum squared resid	559.3009	Schwarz criterion	5.158841	
Log likelihood	-172.0624	Hannan-Quinn criter.	5.081391	
F-statistic	40.68770	Durbin-Watson stat	1.732610	
Prob(F-statistic)	0.000000			

Source: The author

The following table 4 aims to show which indirect taxes have the greatest impact on the redistribution of government revenue. As a dependent variable showing this redistribution, the amount of government expenditure is used. The strongest relation is observed with revenue from excise (-3.022397). The negative coefficient allows us to claim that a unit increase in revenue from excise duties will reduce government expenditure. The resulting VAT and customs rates are positive. The dependence between budget expenditure and revenue from VAT (1.739005) is stronger. It is noteworthy that if the revenue from VAT increases, the state's reallocation function will be increased by government expenditure. The disproportionate link between expenditure and duties (1.559101) indicates that a positive change in the independent variable leads to a positive change in the dependent variable, i.e. expenditure.

Table 4. Dependent variable: expenditure

Variable	Coefficient	Standard Error	T-statistic	Probability
<b>Constant</b>	42.22967	6.592222	6.405983	0.0000
<b>Duty</b>	1.559101	1.640307	0.950494	0.3453
<b>Excise</b>	-3.022397	2.084059	-1.450246	0.1517
<b>VAT</b>	1.739005	1.386641	1.254113	0.2142
R-squared	0.036423	Mean dependent var	38.09714	
Adjusted R-squared	-0.007376	S.D. dependent var	5.643952	
S.E. of regression	5.664729	Akaike info criterion	6.361840	
Sum squared resid	2117.884	Schwarz criterion	6.490326	
Log likelihood	-218.6644	Hannan-Quinn criter.	6.412876	
F-statistic	0.831590	Durbin-Watson stat	2.139884	
Prob(F-statistic)	0.481257			

Source: The author

Table 5. Dependent variable: expenditure

Variable	Coefficient	Standard Error	T-statistic	Probability
<b>Constant</b>	32.58516	2.313180	14.08674	0.0000
<b>Capital</b>	-10.77400	2.822860	-3.816697	0.0003
<b>Dividend</b>	0.890562	0.336915	2.643285	0.0103
<b>Income</b>	1.291517	0.354540	3.642797	0.0005
R-squared	0.334559	Mean dependent var	38.11537	
Adjusted R-squared	0.303367	S.D. dependent var	3.445919	
S.E. of regression	2.876121	Akaike info criterion	5.007784	
Sum squared resid	529.4125	Schwarz criterion	5.138344	
Log likelihood	-166.2647	Hannan-Quinn criter.	5.059516	
F-statistic	10.72563	Durbin-Watson stat	1.753921	

Source: The author

Table 5 shows the dependency between government expenditure and taxes on labor. The strongest relation was observed with taxes on capital (-10.77400). The negative coefficient testifies to the fact that an increase on this

tax will lead to a large decline in government expenditure. In the case of taxes on dividend, the situation is quite different. The positive coefficient (0.890562) shows a weak proportional dependence. I.e. an unit increase of dividend tax will increase and budget expenditures. The income tax ratio (1.291517) is also positive, which suggests that, if there are prerequisites for growth in income tax and capital income, this would lead to an increase in government expenditure, which will strengthen the state's redistributive function.

On the basis of the annual data for the period 1999 - 2012, the economic growth of Bulgaria has analyzed by the GDP per capita variable. The link between economic growth and taxes on consumption and labor is followed. The analysis is again done using the regression method and the results are presented in the following two tables 6 and 7.

*Table 6. Dependent variable: GDP per capita*

<b>Variable</b>	<b>Coefficient</b>	<b>Standard Error</b>	<b>T-statistic</b>	<b>Probability</b>
<b>Constant</b>	7646.641	2535.544	3.015780	0.0117
<b>Capital</b>	1528.862	251.6351	6.075710	0.0001
<b>Dividend</b>	-315.5026	203.9240	-1.547158	0.1501
<b>Income</b>	-84.10003	84.58006	-0.994325	0.3414
R-squared	0.908450	Mean dependent var	3533.333	
Adjusted R-squared	0.883481	S.D. dependent var	1431.616	
S.E. of regression	488.6798	Akaike info criterion	15.44447	
Sum squared resid	2626888.	Schwarz criterion	15.63328	
Log likelihood	-111.8335	Hannan-Quinn criter.	15.44246	
F-statistic	36.38411	Durbin-Watson stat	1.120631	
Prob(F-statistic)	0.000005			

*Source:* The author

Table 6 has showed dependence between economic development and the three types of direct taxes (on capital, dividend and income). There is a direct correlation between GDP per capita dynamics by a coefficient of 7646.641 and taxes on capital by a coefficient of 1528.862. Therefore, per unit growth by GDP per capita, it is concluded that there is an increase in the revenue from taxes on capital. It is found that if the economy grows, this also leads to a growth in revenue from taxes on capital. It is noticeable that there is a negative



dividend tax ratio (-315.5026). This means that when these taxes are increased, there will be a decrease in the dependent variable. Income tax is also reversed (-84.10003). It can be concluded that economic growth has seen a decline in revenue from income and dividend taxes.

Table 7 includes the dependent variable GDP per capita and three independent variables: revenue from taxes on duties, excise and VAT. The results show that there is the strongest relation between GDP per capita and excise revenue (-3914.819).

The negative coefficient testifies to an inverse relation between the variables. This implies that an increase in taxes on excise will lead to a decrease in the GDP per capita dynamics. Between GDP per capita and revenue from taxes on duties there is a direct relation, as evidenced by the rate of duty revenue (1878.199). It can be argued that economic growth leads to an increase in excise revenue. Relatively weaker is the registered link with VAT revenues (415.0445). It could be argued that per unit GDP growth per capita will see an increase in VAT revenue. Therefore, if the economy grows, this also leads to a growth in VAT revenues and to duties revenue.

*Table 7. Dependent variable: GDP per capita*

<b>Variable</b>	<b>Coefficient</b>	<b>Standard Error</b>	<b>T-statistic</b>	<b>Probability</b>
<b>Constant</b>	4725.665	557.0856	8.482836	0.0000
<b>Duty</b>	1878.199	1481.763	1.267544	0.2311
<b>Excise</b>	-3914.819	1261.062	-3.104384	0.0100
<b>VAT</b>	415.0445	1077.177	0.385308	0.1074
R-squared	0.811667	Mean dependent var	3533.333	
Adjusted R-squared	0.760303	S.D. dependent var	1431.616	
S.E. of regression	700.9029	Akaike info criterion	16.16579	
Sum squared resid	5403914.	Schwarz criterion	16.35461	
Log likelihood	-117.2435	Hannan-Quinn criter.	16.16378	
F-statistic	15.80235	Durbin-Watson stat	1.159005	
Prob(F-statistic)	0.000266			

Source: The author

## CONCLUSION

In the consumer tax system in Bulgaria there is a large percentage of tax revenues from indirect taxes at the expense of direct tax revenues.

From the conducted study and the econometric model of the Least Squares Method, some generalizations can be made:

Revenues from VAT and income tax revenues, respectively, from the group of indirect and direct taxes examined, have the most impact on the total amount of tax revenue. Regarding the state's redistributive function and its relationship to the level of tax revenues, it could be said that if there were prerequisites for increasing VAT and income tax revenues then government expenditure could increase.

The results have showed that the increase in economic growth has seen a decline in the revenue from the basic direct tax, namely income tax. It can be argued that per unit of GDP growth per capita will see an increase in VAT revenue. Consequently, if the economy grows, this also results in an increase in VAT revenues and revenue from duties. These are expected results for the country relying on consumption taxes.

## REFERENCES

- Auerbach, A. (2006). *The choice between Income and Consumption Taxes*, University of California, Berkeley and NBER
- Baytin, M.I. (1998). *Theory and rights*, Moscow, 1998
- Dickey, D., Fuller, W. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74 (366), 427-431
- Ganchev, G., Stavrova, E. (2009). *International finance and financial policy*, University press, Southwest University "Neofit Rilski", Blagoevgrad
- Gordon, R., Li, W. (2005). Tax structures in developing countries: Many puzzle and a possible explanation
- Macek, R. (2014). The Impact of Taxation on Economic Growth: Case Study of OECD Countries, *Review of economic perspectives*, vol.14, issue 4, 309-328
- Madsen, J., Damania, D. (1996). The macroeconomic effects of switch from direct to indirect taxes, An Empirical Assessment. *Scottish Journal of Political Economy*, 43 (5), 566-578
- Marlow, M. L. (1988). *Public choice*, MartinusMijhoff Publisher, Dordrecht, 56, 259-269
- Moloko A. W. (2004). *Theory and rights*, Moscow

Tanchev, S. (2016). The Role of Proportional Income Tax on Economic Growth of Bulgaria, Economic studies, issue 4, 66 -77

Tanchev, S. (2016). Consumer tax system of Bulgaria in terms of economic growth and crisis, Economic thought, 4, 106-125

Xing, J. (2011). Does tax structure affect economic growth? Empirical evidence from OECD countries, Oxford

## APPENDICES

### Appendix A1

#### Unit root test - Bulgaria (Q1.1999 – Q2.2016)

<i>Test critical values: 5% level</i>		<i>Augmented Dickey-Fuller test statistic</i>	<i>t-Statistic</i>	<i>Prob.*</i>
<b>Capital</b>		-2.904198	-1.773713	0.3904
<b>Dividend</b>		-2.904198	-2.694598	0.0801
<b>Duty</b>		-2.904198	-3.122180	0.0295
<b>Excise</b>		-2.904198	-3.320759	0.0176
<b>Government expenditure</b>		-2.904198	-5.134560	0.0001
<b>Income</b>		-2.904198	-2.445970	0.1333
<b>Government revenue</b>		-2.904198	-3.594248	0.0083
<b>VAT</b>		-2.904198	-3.739104	0.0055

### Appendix A2

#### Unit root test – GDP per capita, Bulgaria, (2000-2012)

<i>Test critical values: 5% level</i>	<i>Augmented Dickey-Fuller test statistic</i>	<i>t-Statistic</i>	<i>Prob.*</i>
<b>GDP per capita</b>	-3.144920	-1.031128	0.7050

## Appendix B1

### Johansen Cointegration Test – Bulgaria

Series: government revenue/ revenue from taxes on capital, dividend and income

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.908873	75.28733	47.85613	0.0000
At most 1 *	0.795440	39.35489	29.79707	0.0030
At most 2 *	0.549107	15.55151	15.49471	0.0490
At most 3 *	0.213563	3.603647	3.841466	0.0576

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.908873	35.93244	27.58434	0.0034
At most 1 *	0.795440	23.80338	21.13162	0.0205
At most 2 *	0.549107	11.94786	14.26460	0.1126
At most 3 *	0.213563	3.603647	3.841466	0.0576

## Appendix B2

### Johansen Cointegration Test – Bulgaria

Series: government expenditure/ revenue from taxes on capital, dividend and income

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.789120	54.06660	47.85613	0.0117
At most 1 *	0.745568	30.71959	29.79707	0.0391
At most 2 *	0.399323	10.18877	15.49471	0.2665
At most 3 *	0.155958	2.543302	3.841466	0.1108

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.789120	23.34701	27.58434	0.1591
At most 1 *	0.745568	20.53082	21.13162	0.0605
At most 2 *	0.399323	7.645469	14.26460	0.4159
At most 3 *	0.155958	2.543302	3.841466	0.1108

### Appendix B3

#### Johansen Cointegration Test – Bulgaria

Series: GDP per capita/ revenue from taxes on capital, dividend and income

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.972351	97.44692	47.85613	0.0000
At most 1 *	0.884330	50.80089	29.79707	0.0001
At most 2 *	0.792736	22.75972	15.49471	0.0034
At most 3 *	0.162208	2.300808	3.841466	0.0293

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.972351	46.64603	27.58434	0.0001
At most 1 *	0.884330	28.04117	21.13162	0.0046
At most 2 *	0.792736	20.45891	14.26460	0.0046
At most 3 *	0.162208	2.300808	3.841466	0.0293

### Appendix C1

#### Ramsey RESET test

Specification: government revenue  $\kappa$  revenue from taxes on duty, excise and VAT

	Value	Df	Prob**
T-statistic	3.703516	12	0.0030
F-statistic	13.71603	(1.12)	0.0030

### Appendix C2

#### Ramsey RESET test

Specification: government revenue  $\kappa$  revenue from taxes on capital, dividend and income

	Value	df	Prob**
T-statistic	1.366000	12	0.1970
F-statistic	1.865956	(1.12)	0.1970

### Appendix C3

#### Ramsey RESET test

Specification: government expenditure κ revenue from taxes on duty, excise and VAT Bulgaria

	Value	df	Prob**
T-statistic	1.150351	12	0.2724
F-statistic	1.323306	(1.12)	0.2724

### Appendix C4

#### Ramsey RESET test

Specification: government expenditure κ revenue from taxes on capital, dividend and income

	Стойност	df	Prob**
T-statistic	0.010210	12	0.9920
F-statistic	0.000104	(1.12)	0.9920

### Appendix C5

#### Ramsey RESET test

Specification: GDP per capita κ revenue from taxes on duty, excise and VAT

	Стойност	Df	Prob**
T-statistic	1.209657	10	0.2542
F-statistic	1.463269	(1.10)	0.2542

### Appendix C6

#### Ramsey RESET test

Specification: GDP per capita κ revenue from taxes on capital, dividend and income

	Стойност	Df	Prob**
T-statistic	1.482001	10	0.1692
F-statistic	2.196328	(1.10)	0.1692