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*Stoyan Tanchev*[1]

# THE ROLE OF THE PROPORTIONAL INCOME TAX ON ECONOMIC GROWTH OF BULGARIA

*This article looks at the possibilities of proportional and progressive income tax in Bulgaria, as factors for the formation of economic growth. The empirical study found proportional relationship between progressive taxation and economic growth. Inversely proportional relationship has been registered between the dynamics of growth and the proportional taxation. The results show the presence of synchronicity between progressive income taxation and collection. There have been established evidences for presence of causality.*
*JEL: E62; H21; H24*

## 1. Introduction

Taxation plays an important role in the modern world, being one of the most important instruments for regulating the national economy. Through a system of taxes the state maintains macroeconomic stability; it intervenes in the allocation of resources and redistributes income in favor of the weaker. Thus, taxation by definition is characterized by a wide range and its basis must have an optimal structure based on general economic principles.

Therefore, taxation should be seen not only as a fiscal instrument, but also as an effective lever for economic development. Last but not least, it is necessary to look for such a mechanism for the allocation of the tax burden that supports individual well-being. All mentioned above presupposes that a well-structured tax system is able to exercise fiscal and economic effective policy and thus having a positive effect on the whole economy. Moreover, it should seek such a harmonization, whose motives aim at achieving fiscal stability, encouraging investment activity and achieving growth in the economy. By definition, "fiscal policy is characterized by a combination of measures and activities which the State must strive for in the field of taxation to achieve certain fiscal, social and economic objectives." What should be emphasized is the importance of the age-old collision between progressive and proportional taxation, a collision which does not subside today. By that work the author also tries to compare the impact of the two major types of taxation on the economy.

[1] *Stoyan Tanchev is Assist. Prof. in SWU "Neofit Rilski" – Blagoevgrad, Faculty of economics, e-mail: stoyan_tanchev@yahoo.com.*

The main feature of the tax system evolution in Bulgaria in the last twenty years has been the gradual decreasing of direct taxes and the level of redistribution via state budget. At the heart of the Bulgarian tax reform is the introduction of the so-called "flat personal income tax". The tasks of this neoliberal tax revolution aim the additional stimulus for labor supply, a stronger foreign capital inflow, higher saving and investment, more dynamic economic growth. While these developments aim at more competitive and efficient decentralized market economy they reproduce in fact post-communist practices in Eastern Europe and Russia. Over the past twenty years there has been a clear trend in the countries of Central and Eastern Europe, as well as in some Asian countries, to replace the progressive with proportional taxation, in order to encourage economic activity. It is presupposed that lowering tax rates would have had a positive impact on the dynamics of domestic demand due to the increase in disposable income of the economic agents. Thus presented, these trends should provide the necessary incentive effect for a higher growth in GDP and hence, prosperity.

The object of the article is the personal income tax, in particular the proportional taxation, considered as a factor for the economic growth between 2008 and 2012. On this basis, the results obtained have been compared and contrasted with similar results from the progressive taxation, stimulating the economic growth in the period 2004-2007.

The subject of the present paper is the effect of the proportional taxation on the economy of Bulgaria. The analysis of the mentioned connections is performed by studying the macroeconomic variables: *Gross Domestic Product, Employment, Direct Foreign Investment, Tax Revenues.*

The research thesis in broad terms admits that taxation is not neutral and has a significant and statistically detectable impact on the economic activity. In the course of the study an empirical evidence is provided that rejects the assumptions about proportional taxation as a factor for economic growth. On the other hand, it is assumed, that there is a strong positive synchronous relationship between progressive taxes and economic growth.

Clearly presented the Bulgarian experience of application of the proportional income tax proves that its interaction with the studied macroeconomic variables is considerably more complicated and ambiguous than the standard theoretical assumptions.

## 2. Literature Review

The starting point focuses on the generally accepted theories of economic growth, whose basis is the neoclassical model of Solow (1956). The model emphasizes the savings and investment as a factor for economic growth. It is assumed that the balance in economy is not an exception, but a rule, i.e. the system always returns to its equilibrium state, no matter how and in which direction it has been disturbance.

Considering the factors that influence the income tax, it is assumed that if a proportional tax at a tax rate $t$ is introduced, the funds released, according to Solow, will be directed towards the accumulation of capital, i.e. the economy will implement higher levels of savings and

investments respectively. An important complementary element in the model is the possibility of an optimum level of consumption in which the optimal level of savings equals the investment (conclusions drawn for closed economy where the current account is zero, but in terms of small open economy this rule is not always valid). Therefore, in terms of taxation the following equation can be given:

$$\dot{K} = s(1-t)Y + tY = (s(1-t)+t)Y, \quad (1)$$

Where:

$\dot{K}$ - Capital gains;

S - Savings;

t - Tax rate;

Y - Income;

It can be alleged that the growth of capital $\dot{K}$ in this case is the product of the savings rate, and the income tax rate (assuming that the income from taxation can both be invested and increase savings, as well as reduce them). If we accept, in particular, that taxes are consumed, the reduction of income tax rate increases the personal disposable income. If a part of the freed resources is invested, and the rest is consumed, the ratio of savings might change. Therefore, the savings rate increases as investments also increase. Conversely, if the autonomous income is consumed, the rate of savings and investments shrinks. Very often it is assumed that the savings rate in high-income is higher than the average in which progressive taxation, provided that the state does not invest the collected tax money, reduces savings and investment. Therefore, progressive taxation ultimately slows economic growth.The marked connections reflect the neoclassical approach. Keynesian analysis, however, is based on fundamentally different assumptions. According to Keynes savings do not determine investments; it is vice versa - investments create the necessary savings by a banking and financial system conclusions of Ganchev, Tsenkov, Stavrova (2014). In this situation, the main factor for investing activities is not taxation, but it is the investment climate and it is what Keynes calls animal spirit.

The popularity of the proportional tax over the last twenty years comes from the American economists Robert Hall and Alvin Rabushka (1995). They draw the conclusions that assuming proportional tax of 19% will have a very positive effect on consumption, government revenue and the economic growth.

Cassou and Lansing (1996) (with simulation model) study what the impact will be if a reform takes place, which replaces progressive with one proportional income taxation for the US economy. Empirical analysis explores – revenues from households, capital and government spending. The model results show that revenues from each taxpayer can be increased, in a range from 0.18 to 0.85% annually. The conclusion is drawn that the exempt income leads to higher consumption and investment.

Ganev (2009) for economy of Bulgaria with Ordinary Last Square Method detects correlation between proportional income tax prosperity and government revenue. He

examined economic variables of revenue on proportional income taxation and tax-free threshold at two different levels. Ganev claims that proportional taxation improves the welfare of taxpayers as a result of the reduced rates and break social justice. According to him budget revenues from proportional income tax will increase as a result of the broader taxes.

In another study for economic on USA, Jorgensen and Wilcoxen (1997) found correlation between employment and lowered progressive tax rates. The results show, that income of households increase with 10% and of capital with 12%. The authors confirms that lower progressive income tax stimulate the employment. These determinations on macroeconomics variable have a positive influence on the economic growth. Therefore the economic has developed successfully and GDP increase with 3.7%.

The opposite conclusions are made by the Nobel laureate Stiglitz (2014) who alleges that "Lowering taxes in the US did not increase revenue, and the only thing that increased is the share of the deficit."

Marinas (2009) with panel data (VAR model) examines the impact of proportional income taxation and variables of GDP, revenue of proportional tax, employment, unemployment, share of the “gray "economy, consumption and investment for the Baltic countries (Estonia, Lithuania, Latvia) and Romania. The empirical evidence shows that proportional taxation has no impact of the economic growth. The existence of statistical significance between the dynamics of proportional tax rate and investment, but with a negative coefficient. He found correlation between the proportional tax and employment. Therefore when economy are in expansion, proportional tax has a positive effect on employment and it stimulates consumption; however, when the economy is in recession the proportional income tax increases the decline, since demand decreases (Keyns`es paradox). No stronger connection can be found, for example, in Estonia in terms of strong economic growth direct tax revenues shrink by 12% in 1994 to 7.5% in 2008 years.

Ivanova, A., M. Keane and A. Klemm (2005), researches increase personal income, employment and budget revenues from proportional taxation in Russia with quarterly data for the period 2001-2004. The statistical data in this article have been calculated by the Method of Ordinary Last Square. The empirical results find out a positive proportional correlation between proportional income tax and dynamic of budget revenues. There is no evidence about the existence a statistically significant connection between employment and tax rates. In conclusion, authors says, that higher revenues are justified by the extreme increase of personal income and partly by lightness of the economy, not by the proportional taxation.

Radulescu (2009) examines the budget revenue and the collection of proportional income taxation with panel data for countries – Estonia, Lithuania, Latvia, Slovakia and Romania. With VECM model for period 2001-2008, the author found that there is an inversely proportional relationship between variables. Therefore he has no reason to assume that the collection is rising. In conclusions he reached the following and comes to the following result:

- The reform in the countries concerned is linked to a reduction in the share of revenues from proportional taxation. Low income leads to an increase in the amount of indirect taxes.

Keen, Kim and Varsano (2006) found evidence that there is no correlation between the proportional taxation and the increase in fiscal revenues for Russia and Slovakia.

With use of panel data for period 2002-2005 about standard SVAR model in the analysis covers the macroeconomic determinants such as proportional income tax, employment and welfare of the population-Djini coefficient. The authors add that after the adoption of proportional taxation tax revenues from have declined. With these results, we have no reason to assume that the budget revenues will increase automatically after the proportional tax reform.

Gechev (2010) research variables of foreign directed investments and revenue of proportional income tax for economic of Bulgaria for period 2008-2009. Founded negative collection between proportional tax and foreign directed investments. Therefore investments are not increase. According to him a positive determination between proportional tax rate and revenue of proportional tax is evident. But this higher revenue is a result from the dynamic of inflation.

The imposed a 10% flat tax is analyzed by Brusarski, R. (2012). Statistics found that as it concerns the economy of Bulgaria the proportional tax probably boosts the employment, limits the tax evasion and increases compliance. This tax, however, has no redistributive effect. Reducing inequality requires the introduction of some progressiveness. Brusarski claims that the adoption of non-taxable minimum for the lowest incomes, will lower revenue by 500 million leva per year. Replacing the proportional tax by a neutral in terms of tax revenue progression of Benton, requires increasing the positive marginal tax rate from 10 to 15%. The application of a negative income tax (that social transfers from the state to individuals with low incomes) in the tax rate of 15% will reduce revenues by more than 50%. Neutrality, regarding the budget in case of presence of negative income tax, marginal rate requires a 20% tax rate.

By the econometric regression model for period 2000-2012, Ganchev, G. (2013) examines the relationship between the income growth and rates of growth of revenues from income taxes (progressive and proportional income taxation) for Bulgaria. In the article he claims that „If the tax collection grows, the tax revenues should grow faster than the growth in income itself, especially in terms of proportional taxation". The result from the study formulates the conclusion that in terms of proportional tax collection the revenues do not increase but rather decreases.

## 3. Methodology and limitations of the study

Methodological and theoretical basis of the research can be formulated in the following sequence:

- Theoretical analysis whose basis is the neoclassical model of Solow;

- Development and implementation of practical econometric models. The analysis which reflects the quantitative results of the application of econometric methodology is based on the Method of least squares with a dummy variable. Quarterly statistical data of the National Statistical Institute (NSI) is used, for Period 1 from 31.03.2004 till 31.12.2007, Period 2 from 31.03.2008 till 31.12.2012. In total there are 36 observations. For the Period I – 16 observations and for Period II – 20 observations.

Before proceeding to the election of the econometric method it is necessary to apply a test to establish the stationarity (the presence of unit root). Since we have been used quarterly data, it is necessary for them to be seasonally adjusted - Seasonal Adjustment.

About static time series we say that are stationary when the average, the variance and the autocorrelation of the submitted phenomena and processes are independent in time Arkadiyev D. (2005) Therefore, a time series $Y_t$ in order to be defined as a stationary (stochastic) process it must meet the following requirements:

$$E(Y_t) = \mu \tag{2}$$

$$D(Y_t) = E(Y_t - \mu)^2 = \sigma^2 \tag{3}$$

$$cov\,(Y_t, Y_{t+k}) = E(Y_t - \mu)(Y_{t+k} - \mu) = \gamma_k \tag{4}$$

Equations 2 and 3 show the requirements that the arithmetic mean and the variance should be constant in time. Equation 4 requires the covariance between two of the values of the variable to depend only on the time interval between them, not on their position in time. If these processes are met, it is executed with this requirement of independence over the time. Therefore, if this process has the given characteristics, it is known as **white noise**.

A special feature is that if it does not possess these characteristics, we define it as non-stationary, i.e. there is a unit root. The empirical studies based on economic time series, a common type of nonstationarity, are called a **random walk**. It occurs when there is a correlation of the current value of a variable influenced by its previous value and then we write down the following:

$$Y_t = Y_{t-1} + u_t \tag{5}$$

In this case it is established whether a particular time series is stationary when checking for the presence of a single root. For a clearer definition, let us see the following stochastic process:

$$Y_t = \rho Y_{t-1} + u_t, -1 \leq \rho \leq 1 \tag{6}$$

In cases when it is defined that $\rho = 1$, a non-stationary process is to be found when there is $|\rho| \leq 1$, the time series $Y_t$ is stationary according to the displayed characteristics. Taking the stationary process, one of the most frequently used tests for a unit root is the extended test of Dickey and Fuller, the so-called ADFT test (Augmented Dickey - Fuller Test) [21]. It is based on the assumption that the time trend is characterized as an autoregressive process

of order $p$. The econometric estimation of the test is performed by an auxiliary equation which includes as explanatory variables the differences between $p$ past values, known as **lags** of the dependent variable. Thus, the following equation can be deduced:

$$\Delta Y_t = \alpha_1 + \alpha_2 t + \delta Y_{t-1} + \beta_1 \Delta Y_{t-1} + \beta_2 \Delta Y_{t-2} + \cdots + \beta_p \Delta Y_{t-1} + V_t, \quad (7)$$

Where $V_t$ has the characteristic of white noise and is

$$\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2}), \ \Delta Y_{t-2} = (Y_{t-2} - Y_{t-3}) \quad \text{etc., and } \delta = (\rho - 1). \quad (8)$$

Thus, the null hypothesis of Dickey - Fuller test states that the time trend has a unit root or it is non-stationary, when $\delta = 0$, i.e. $H_0: \delta = 0$ and the alternative hypothesis is $H_1: \delta \leq 0$. what is used for the verification of the null hypothesis is $t$ for $\delta$ (i.e. this is the assessment of $\delta$ at a standard error), where $\tau_{\hat{\delta}} = \hat{\delta} / se(\hat{\delta})$, and what is applied here is not the standard *t* distribution of Student but are the simulated critical values Davidson and MacKinnon (1989).

In cases where it is demonstrated that there is a unit root it is necessary to make transformation of trends, respectively to calculate the first and second difference. The accepted level of error of the first order is 5%. The length of the included in the test lags of the dependent variable is defined on the basis of minimizing the Schwarz information criterion.

From the results of the Dickey-Fuller test in the variables it is not established the presence of a unit root, i.e. the processes are stationary and it is not necessary to transform by the first or the second differences and they are presented in Appendix 1. In the so established dependence it is possible to move to a procedure for applying linear regression method.

The conduct of the econometric study we calculate by linear regression using the Method of least squares (OLS) and it is included in the dummy variable equation – DUMMY VARIABLE.

Using a dummy variable is intended to divide the regression equation of the two sub periods. In this case matching coefficients measured by registered and reverse links at a time of progressive and proportional taxation are required .

To conduct calculation the dummy variable takes two values - (0) for a period of progressive taxation (2004-2007) and (1) for the proportional (2008-2012).

The presented in Table 1 symbols are used both in the data submitted by econometric models and in the analysis based on them. For that purpose, we apply an econometric equation with the following standard form:

$$y_t GDP = C + \beta_1 EMP_t + \beta_2 INV_t + \beta_3 TAX_t + \beta_4 (EXPT1.0) + \varepsilon_t \quad (9)$$

Table 1

Symbols used for the examined macroeconomic variables

| № | Symbol | Examined variable |
|---|---|---|
| 1. | GDP | Growth rate of Gross domestic product |
| 2. | EMPL | Growth rate of Employment |
| 3. | INV | Growth rate of Foreign Direct Investment |
| 4. | TAX | Growth rate of Proportional Income Tax Revenues |
| 5. | EXPT=0.0 | DUMMY VARIABLE taking value 0 and covering the period of application of a progressive tax system – from 2004 till 2008 |
| 6. | EXPT=1.0 | DUMMY VARIABLE taking value 1 and covering the period of application of a proportional tax system – from 2008 till 2012 |
| 7. | $\varepsilon_t$ | Residuals |

## 4. Empirical Analysis

The results of the linear regression, including all examined variables and ***EXPT = 1.0*** in period of proportional income tax (Table 2) show the statistical significance of the variable ***EXPT = 1.0*** and its value (-1.769816). It was found that the negative symbol of ***EXPT = 1.0*** leads to reduction in the regression constant ***C***, whose registered coefficient is (0.858567). We can draw a conclusion which results in decrease in GDP at neutralizing the influence of the other explanatory variables used in the regression equation. It is evident that the coefficient of tax revenues (0.056352) under the influence of ***EXPT = 1.0*** also becomes negative which leads to a contraction in revenues. In summary, we can state that in proportional taxation there are no conditions for the growth of GDP, but rather for the limit of its dynamics.

We cannot fail to notice that the explanatory variables employment and investment are statistically insignificant - their t-statistics have values less than 2. Considering the results together with the fact that in EXPT = 1.0 it is statistically significance supports the above conclusions.

Table 2

Dependent variable: GDP

| Variable | Coefficient | Std. Error | t-Statistic | Probability |
|---|---|---|---|---|
| C | 0.858567 | 4.267853 | 0.201171 | 0.8419 |
| INV | -0.024843 | 0.050781 | -0.489210 | 0.6281 |
| EMPL | 0.008747 | 0.075328 | 0.116122 | 0.9083 |
| TAX | 0.056352 | 0.027243 | 2.068513 | 0.0470 |
| EXPT=1 | -1.769816 | 0.699968 | -2.528425 | 0.0168 |

Analyzing the results of the regression equation, including all examined variables and ***EXPT = 0.0***, related to a progressive tax system (Table 3) we can take into account that as statistical significance and subsequent conclusions are observed the opposite results of the registered for ***EXPT = 1.0***. From this, we can draw conclusions opposite to those characteristic of the proportional tax system, and namely and primarily that in terms of

progressive taxation there are prerequisites which lead to GDP growth. The drawn conclusion is confirmed by the presence of the positive correlation of the coefficient ***EXPT = 0.0*** (1.769816), compared to the coefficient of the regression constant ***C*** and established value (-0.911249).

Table 3

Dependent variable: GDP

| Variable | Coefficient | Std. Error | t-Statistic | Probability |
|---|---|---|---|---|
| C | -0.911249 | 4.580077 | -0.198959 | 0.8436 |
| INV | -0.024843 | 0.050781 | -0.489210 | 0.6281 |
| EMPL | 0.008747 | 0.075328 | 0.116122 | 0.9083 |
| TAX | 0.056352 | 0.027243 | 2.068513 | 0.0470 |
| EXPT=0 | 1.769816 | 0.699968 | 2.528425 | 0.0168 |

Emphasizing the specifics of the research studies and in particular to the tax revenues, we examine a linear regression of GDP with two explanatory variables – TAX and EXPT. Starting with ***EXPT = 1.0*** (Table 4) and the impact of the proportional tax system, we should note the presence of the statistically significant variables – the regression constant ***C*** and ***EXPT = 1.0*** with values (1.094936) and (-1.519108) respectively. The negative sign of ***EXPT = 1.0*** shows that in a proportional tax system there is a strong limitation of the dynamics of GDP – the constant ***C*** decreases, resulting in the overall decrease in GDP growth rates. This logically leads to lower tax revenues – a conclusion established by the statistical coefficient of TAX and its value (0.055689). Therefore, the application of proportional taxation in our country, all other things being equal, does not form higher revenues and there are no prerequisites for stimulating the dynamics of GDP.

Confirmation of the said above we can find in the regression equation of GDP which includes ***EXPT = 0.0***, a variable reflecting the effect of the progressive tax system in our country (Table 5). The established value of ***EXPT = 0.0*** is positive and statistically significant with a coefficient (1.519108), and that of the constant ***C*** is (-0.424172). In the thus formed conditions there is increase in the revenues from progressive taxation established by the positive coefficient of TAX and its value (2.110903). The registered indicators would imply that, other things being equal, the progressive taxation has positive impact on the economic growth in the Republic of Bulgaria.

Table 4

Dependent variable: GDP

| Variable | Coefficient | Std. Error | t-Statistic | Probability |
|---|---|---|---|---|
| C | 1.094936 | 0.387855 | 2.823056 | 0.0080 |
| TAX | 0.055689 | 0.026382 | 2.110903 | 0.0424 |
| EXPT=1 | -1.519108 | 0.403989 | -3.760267 | 0.0007 |

Table 5

Dependent variable: GDP

| Variable | Coefficient | Std. Error | t-Statistic | Probability |
|---|---|---|---|---|
| C | -0.424172 | 0.347282 | -1.221403 | 0.2306 |
| TAX | 0.055689 | 0.026382 | 2.110903 | 0.0424 |
| EXPT=0 | 1.519108 | 0.403989 | 3.760267 | 0.0007 |

After the establishment of the results of the regression analysis, a necessary condition is the testing for the presence of cause-and-effect relationships. For this purpose, we apply the test for the presence of bi-directional Granger causality checking the two periods of taxation. Granger null hypothesis states that there is no presence of causality and the alternative respectively establishes the opposite. The results set out in Table 6 show that between GDP and proportional taxation there is no Granger causality. After including the other variables (Table 7), and namely investment and employment there is no presence of causality. Therefore, the null hypothesis is confirmed here.

Table 6

| Granger Causality Tests | F-Statistic | Probability |
|---|---|---|
| TAX does not Granger Cause GDP | 1.16348 | 0.3429 |
| GDP does not Granger Cause TAX | 2.31235 | 0.1383 |

Table 7

| Granger Causality Tests | F-Statistic | Probability |
|---|---|---|
| TAX does not Granger Cause GDP | 1.16348 | 0.3429 |
| GDP does not Granger Cause TAX | 2.31235 | 0.1383 |
| EMPL does not Granger Cause GDP | 1.97044 | 0.1789 |
| GDP does not Granger Cause EMPL | 0.32070 | 0.7312 |
| INV does not Granger Cause GDP | 1.88308 | 0.1913 |
| GDP does not Granger Cause INV | 1.58838 | 0.2415 |
| EMPL does not Granger Cause TAX | 2.38916 | 0.1307 |
| TAX does not Granger Cause EMPL | 0.21709 | 0.8077 |
| INV does not Granger Cause TAX | 2.16057 | 0.1548 |
| TAX does not Granger Cause INV | 0.47276 | 0.6336 |
| INV does not Granger Cause EMPL | 1.68668 | 0.2232 |
| EMPL does not Granger Cause INV | 0.65137 | 0.5375 |

When considering the results of progressive taxation (Table 8 and 9) we can draw a conclusion opposite to that of proportional taxation. It was found that between GDP and progressive taxation there is presence of causality according to the Granger test. There is a dependence based on the impulses in the economy according to the examined variables are caused by TAX to GDP. The main conclusion is that progressive taxation affects the dynamics of GDP. Hence, the established result rejects the null hypothesis and the alternative is accepted.

Table 8

| Granger Causality Tests | F-Statistic | Probability |
|---|---|---|
| TAX does not Granger Cause GDP | 4.65682 | 0.0409 |
| GDP does not Granger Cause TAX | 0.43476 | 0.6603 |

It is obvious that the results of this analysis support progressive taxation. This is established by the presence of statistical coefficients and the positive sign (***EXPT 0, 0***). It can be considered that, at other things being equal progressive taxation stimulates economic

growth, it improves the investment activity, employment and it leads to higher revenues. There is a presence of a cause-and-effect relationship between progressive taxation and GDP, while similar results cannot be established between proportional taxation and dynamics of GDP.

Table 9

| Granger Causality Tests | F-Statistic | Probability |
|---|---|---|
| TAX does not Granger Cause GDP | 4.65682 | 0.0409 |
| GDP does not Granger Cause TAX | 0.43476 | 0.6603 |
| EMPL does not Granger Cause GDP | 0.73551 | 0.5060 |
| GDP does not Granger Cause EMPL | 1.43729 | 0.2873 |
| INV does not Granger Cause GDP | 0.94878 | 0.4228 |
| GDP does not Granger Cause INV | 0.11598 | 0.8918 |
| EMPL does not Granger Cause TAX | 0.29995 | 0.7480 |
| TAX does not Granger Cause EMPL | 0.12743 | 0.8819 |
| INV does not Granger Cause TAX | 0.21037 | 0.8142 |
| TAX does not Granger Cause INV | 0.46708 | 0.6412 |
| INV does not Granger Cause EMPL | 0.17278 | 0.8440 |
| EMPL does not Granger Cause INV | 0.91000 | 0.4366 |

## 5. Empirical conclusions and generalizations

The results of the empirical researches are supported by its F-statistic, which indicates statistical significance of the regression equation.

In the period of proportional income taxation there are no prerequisites for the growth of GDP, but rather for limitation of its dynamics. This is confirmed by statistically significant coefficient of the negative sign EXPT = 1.0, which reduces the regression constant C. We can state that the proportional income taxation doesn't lead to increase of the revenue, but rather to limitation of its dynamics.

In terms of progressive income taxation there are prerequisites for increasing the rate of GDP. The results from the regression equation, between including all examined variables and EXPT = 0.0, in period of progressive income tax, are opposite to those of proportional taxation. This is confirmed by the coefficient of EXPT = 0.0 and the one of the regression constant C. Therefore we can say, that the revenue of the progressive income tax also increase.

In an equation with two explanatory variables, and namely GDP and TAX, the result is repeated. The sign of EXPT = 1.0 proves that in a condition of proportional income tax there is limitation of the GDP dynamics. Therefore the regression constant C decreases, which results in a total GDP reduction. In a system of progressive taxation there are prerequisites for increasing the rate of GDP, this is confirmed by the positive coefficient of EXPT = 0.0 and the indicator of the regression constant C. It is assumed that the progressive income taxation as an economic instrument creating prerequisites for stimulating the dynamics of GDP – inbuilt atomically stabilizations**.**

After the reform, the fiscal revenue of proportional income tax is unpredictable and the economic and the social policy are unstable. The explaining of that relationship indicates that the 10% proportional income taxation does not stimulate the revenue and the economic growth, but it rather has a negative impact.

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Appendix 1

ADF TEST FOR UNIT ROOT

| Test critical values: 5% level | Augmented Dickey-Fuller test statistic | t-Statistic | Prob.* |
|---|---|---|---|
| GDP | -4.040966 | 2.948404 | 0.0035 |
| INCOME TAX | -10.20912 | -2.948404 | 0.0156 |
| INVESTMANT | -3.452093 | -2.948404 | 0.0156 |
| EMPLOYMENT | -3.580775 | -2.960411 | 0.0122 |