GOVERNMENT DEBT AS A CONTRADICTORY FACTOR OF ECONOMIC GROWTH

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ABSTRACT

Article seeks to substantiate the hypothesis of contradictory impact of government debt on economic growth. The objectives and related research methods are: empirical analysis and abstract logical analysis of the impact of the level of government debt on economic growth; cluster analysis of European countries in terms of their economic growth, government debt and government expenditure on economic affairs. Substantiated positive impact on economic growth in the following cases: constant or increasing in proportion to the GDP growth of government debt volume subject to gain or maintain the level of government expenditure on economic affairs; government debt level of stability at constant GDP increase and advance the government expenditure on economic affairs.

Keywords: *Economic Growth; Government Debt; Government Expenditure On Economic Affairs; Contradictory*

JEL Codes: O40, H63, E62

1. INTRODUCTION

Continuing the research of national financial architecture as a form of the organization of joint financial activities of public authorities, subjects of real and financial sectors of economy, households, their hierarchical subordination and interrelation, influence of policy of national debt management on economic growth has aroused a particular interest as an absence of perceptible effect of its use in Ukraine is obvious. A complexity of the solution of the specified problem is connected with an urgent need for formation of the scientific machine of reasoning for amount and vectors of financial relations of the government and subjects of real sector which will stimulate finding of stability of national economical development and increasing of social security level in the country.

A purpose of the article is reasoning for hypotheses of contradictory impact of government debt on economic growth and expediency of its use on condition of progressive government economic support of non-financial corporations.

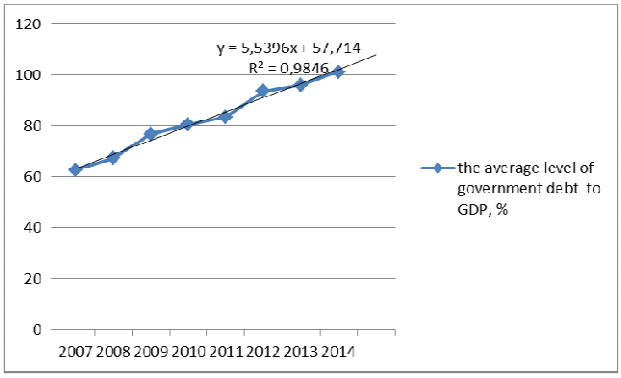
2. THE ANALYSIS OF THE ACTUAL SITUATIONS CONCERNING THE IMPACT OF GOVERNMENT DEBT ON ECONOMIC GROWTH

Research of the last foreign publications concerning the delivered problem has designated quite accurate position of rather negative impact of government debt on economic growth. Checherita-Westphal C., Rother P. (2012) ground nonlinear impact of debt on economic growth, presenting it in the form of a reverse U-shaped curve. According to the authors, a critical point is the government debt level of about 90-100% of GDP, but negative effect on economic growth is designated by the authors already from the debt level of about 70 to 80% of GDP. Analyzing the countries of the eurozone, other researchers – Afonso A., Alves J. (2014) – mark the critical point of government debt level at the level of 75% and 74% of GDP. According to Pescatori A., Sandri D., Simon J. (2014), any critical points of a government debt augmentation are absent in principle as there are no certain structural proportions in its interrelation with economic growth. Calderón C. and Fuentes J. R. (2013) draw a conclusion about: existence of strong negative link between government debt and economic growth; nonlinearity of this link depending on the level of economic development and the level of government debt; possibilities of reduction of negative impact of government debt on the economic growth by structural factors (quality of institutes, development of domestic financial market, and GDP level per capita) and by openness of economy. Swamy V. (2015), while analyzing the results received in empirical research, also draws a conclusion about nonlinear impact of the debt on economic growth, emphasizing that the effect is not regular for all countries and depends to a large extent on such macroeconomic factors as inflation, openness of trade, the directions of final consumption of funds and direct foreign investments.Thus, foreign authors are almost unanimous concerning negative influence of considerable level of government debt on economic growth, at the same time they vary the factors weakening or intensifying such impact. The author's opinion stated in this article is an attempt to confirm a hypothesis of rather contradictory influence of government debt on economic growth depending on the established relations between government and real sector through the system of government spending. In our opinion, distribution of debt funds received from external creditors to non-productive spheres of economy (defense, activities of social functions), still more aggravates financial and economic crisis in the country and makes impossible economic growth whereas a stimulation of development and a financial support of non-financial corporations creates basis for potential economic growth.

3. EMPIRICAL ANALYSIS OF INFLUENCE OF THE LEVEL OF GOVERNMENT DEBT ON ECONOMIC GROWTH

Our own empirical analysis of influence of the level of government debt on economic growth is carried out on the basis of the retrospective database composed on over 22 countries' government debt in the relation to GDP in dynamics of 2007-2014 (Belgium, the Czech republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Luxembourg, the Netherlands, Norway, Poland, Portugal, the Slovak republic, Slovenia, Spain, Sweden, the United Kingdom), in the issue the rising tendency of the average level of government debt has been revealed (figure 1).

Figure 1. A rising tendency of the average level of government debt in the relation to GDP on over 22 countries, %[1]



Among the world leaders Japan, Greece, Italy, Ireland, Portugal and Belgium stand out in the ratio of government debt to GDP[2]. At the same time, according to World Economic Outlook[3], the reduction of GDP in 2014 was 0,1% in Japan, 0,38% in Italy, and in other specified countries there was a growth of GDP (0,69% in Greece, 5,2% in Ireland, 0,9% in Portugal, 1,35% in Belgium). Relation between government debt and growth of GDP by countries sampling appears really identical to the inverted parabola, and researches results of the foreign authors mentioned above testify it.

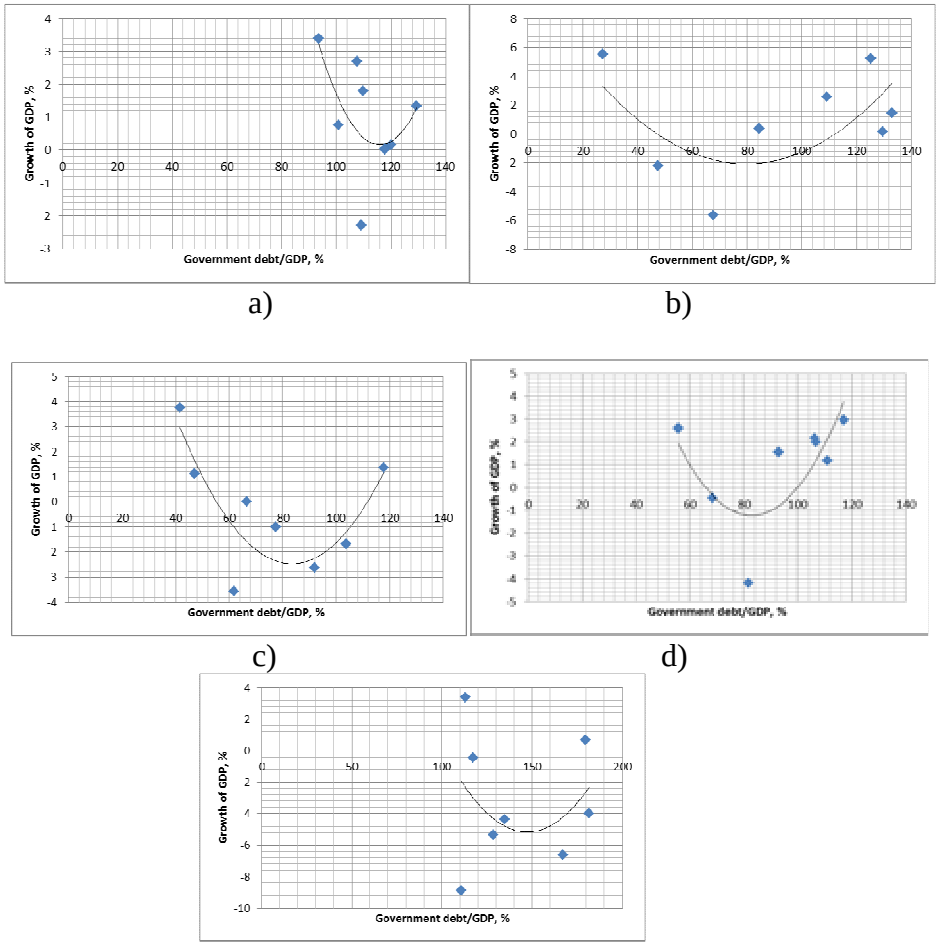
Out background study concerning the countries which have considerable relation of government debt to GDP and at the same time are characterized by positive rates of economic growth (Belgium, Ireland, Spain, Greece, the United Kingdom). Relation between government debt and growth of GDP for these countries appears as the U-shaped curve (it is not inverted contrary to conclusions of foreign researchers) (Figure 2).

[1] It is built according to Organization for Economic Cooperation and Development (OECD, 2016) [An electronic resource]. – Access mode: https://data.oecd.org/

[2] The same

[3] IMF (2016). World Economic Outlook 2014, October 2015 [An electronic resource]. – Access mode: https://www.imf.org

Figure 2. Relation between government debt and growth of GDP by countries sampling which have considerable ratio of government debt to GDP and positive rates of economic growth[4]



a) b) c) d) e)

a) Belgium, b) Ireland, c) Spain, d) the United Kingdom, e) Greece

Thus, empirical researches have shown a contradictoriness of judgments concerning the influence of government debt level on economic growth. Certain countries use the funds received on credit for economy support successfully: this statement is confirmed by the analysis of public expenses structure of certain countries. So, according to Eurostat[5], social protection was the most considerable function of the public expenses almost in all EU countries – in 2014 the public expenses on social protection in EU-28 accounted for 19,5% of GDP on average. The share of expenses on social protection in aggregate expenditures grows from 27,8% in 2008 to 38,7% at the height of economic and financial crisis and 40,4% in

[4] It is built according to Organization for Economic Cooperation and Development (OECD, 2016) [An electronic resource]. – Access mode: https://data.oecd.org/

[5] Eurostat (2016) [An electronic resource]. – Access mode: http://ec.europa.eu/eurostat/statistics-explained/index.php/Government_expenditure_on_general_public_services#Evolution_of_expenditure_on_general_public_services_over_2006-2014

2014. At the same time 4,2% of GDP on average were appropriated for economy support[6]. Meanwhile the highest expense level on economy support in 2007-2014 on average is observed in Belgium (6,75% of GDP), the Czech republic (6,45% of GDP), Greece (6,18% of GDP), Hungary (6,46% of GDP), Ireland (7,26% of GDP), Slovenia (6,02% of GDP) and Spain (5,55% of GDP). As we can see, 4 of 5 countries with high ratio of government debt to GDP and positive rates of economic growth (with the exception of the United Kingdom) are included in this list. The results of the carried-out correlation analysis of interrelation of government expenditure on economic affairs with a government debt change are also interesting: correlation coefficient for the countries with positive rates of economic growth is quite high (for example, it is 0,92 for Denmark, 0,84 for France, 0,76 for Belgium, the average level of correlation is typical for Greece, Hungary, Luxembourg and Slovenia), but Italy which has been experiencing difficulties in achievement of economic growth for the last three years has low coefficient of correlation of economic expenses and government debt, it is the closest on the to zero modulo (-0,07). It should be noted that the well-defined positive or negative conclusion concerning interpretation of values of the specified correlation coefficient should be drawn with a glance of specifics of the certain country development.

Thus close direct relation of government expenditure on economic affairs and government debt is positive if the country which needs additional financial injections in economy channels funds for economic purposes proportionally and gains certain economic effect on the macrolevel. At the same time, decrease in government debt under the growing GDP does not have to affect refusal of permanent financing of economic purposes, and it's quite possible that it will be connected also with its growth, i.e. inverse relation of various tightness degree will be observed in this case (for example, negative correlation coefficient of government expenditure on economic affairs and government debt is typical (-0,69) for Poland which keeps stable rates of economic growth throughout all analyzed period). On the assumption of the carried-out abstract-logical analysis of situational ratio variants of dynamics of GDP activities, the level of government debt and government expenditure on economic affairs (table 1) we can single out the following positive situations accelerating economic growth:

- the invariable or growing volume of government debt in proportion to growth of GDP is admissible on condition of observing the growth or preserving the expense level on economy support;
- increase in government expenditure on economic affairs in case of the stable level of government debt and invariable GDP gives the chance of potential economic growth.
- The negative variants which slow down economic growth are:
- the growth of government debt that outgoes the dynamics of GDP and government expenditure on economic affairs and limits the potential of economic growth;
- decrease in government debt in case of decrease in GDP causing shortage of funds for financing of government expenditure on economic affairs and guaranteeing economic growth.

[6] An article «Government expenditure on economic affairs» presented in reports Eurostat (2016) was taken into account

Table 1: Abstract-logical analysis of situational ratio variants of dynamics of GDP activities, the level of government debt and government expenditure on economic affairs

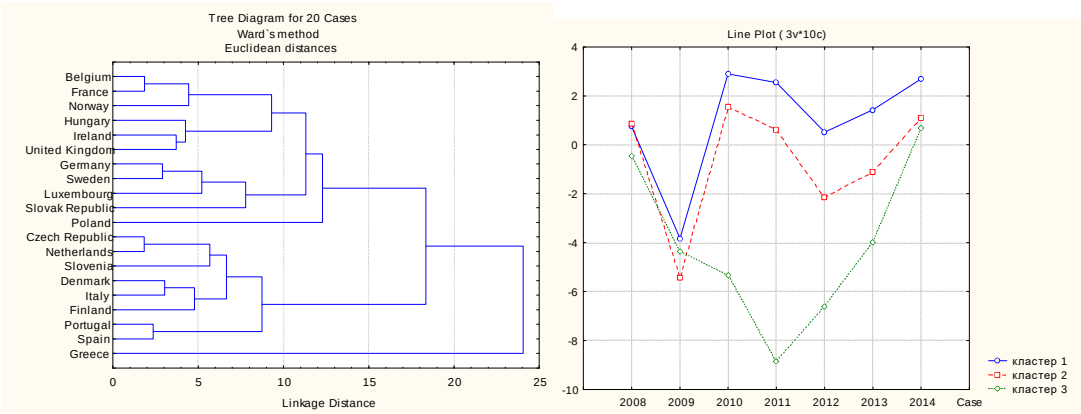
<table>
<tr><th>Situational variants</th><th>ΔGDP>0</th><th>ΔGDP=0</th><th>ΔGDP<0</th></tr>
<tr><td>$\Delta\frac{GD}{GDP}>0; \Delta\frac{GEEA}{GDP}>0$</td><td colspan="2">Neutral situation: There is a proportional growth of government debt and government expenditure on economic affairs that will promote further GDP growth. It is necessary to pay attention to an outgoing of rates of government debt growing over GDP growing. Delay of economic growth will be observed in case of the outgoing of government debt growth and vice versa its acceleration will be observed in case of the outgoing growth of government expenditure on economic affairs</td><td>Neutral situation: There is a positive characteristic of potential economic growth as growing in government debt is followed by growth in government expenditure on economic affairs. It is necessary to pay attention to outgoing of rates of government debt growth over GDP growth</td></tr>
<tr><td>$\Delta\frac{GD}{GDP}>0; \Delta\frac{GEEA}{GDP}=0$</td><td colspan="3" rowspan="2">Negative situation: The growth of government debt outgoes the growth of GDP and government expenditure on economic affairs, limiting the potential of economic growth</td></tr>
<tr><td>$\Delta\frac{GD}{GDP}>0; \Delta\frac{GEEA}{GDP}<0$</td></tr>
<tr><td>$\Delta\frac{GD}{GDP}<0; \Delta\frac{GEEA}{GDP}>0$</td><td rowspan="2">Positive situation: Increase in government expenditure on economic affairs is followed by the invariable or decreasing government debt</td><td colspan="2">Neutral situation: There is a positive characteristic of potential economic growth as decrease in government debt is followed by increase in government expenditure on economic affairs, providing possibilities of economic growth. It is necessary to pay attention to the reasons of decrease or lack of GDP growth</td></tr>
<tr><td>$\Delta\frac{GD}{GDP}<0; \Delta\frac{GEEA}{GDP}=0$</td><td colspan="2">Neutral situation: There is a low amount of government expenditure on economic affairs to promote economic growth. It its followed by decreasing government debt</td></tr>
<tr><td>$\Delta\frac{GD}{GDP}<0; \Delta\frac{GEEA}{GDP}<0$</td><td colspan="2">Neutral situation: The amount of government expenditure on economic affairs provides promoting of economic growth. It is followed by decreasing of government debt and government expenditure on economic affairs. The latter reduces the potential of economic growth</td><td rowspan="4">Negative situation: The amount of government expenditure on economic affairs does not promote economic growth. It is followed by decreasing government debt. Potential of economic growth decreases</td></tr>
<tr><td>$\Delta\frac{GD}{GDP}=0; \Delta\frac{GEEA}{GDP}>0$</td><td rowspan="2">Positive situation: Increase in government expenditure on economic affairs and government debt leads to economic growth</td><td>Positive situation: Increase in government expenditure on economic affairs against the stable level of government debt gives the opportunity of potential economic development</td></tr>
<tr><td>$\Delta\frac{GD}{GDP}=0; \Delta\frac{GEEA}{GDP}=0$</td><td>Neutral situation: There is an invariance of all components which neither provides process of economic growth nor has negative consequences of its decrease. It is a stagnation</td></tr>
<tr><td>$\Delta\frac{GD}{GDP}=0; \Delta\frac{GEEA}{GDP}<0$</td><td colspan="2">Neutral situation: The amount of government expenditure on economic affairs provides promoting of economic growth. It is followed by the growing or invariable government debt. Decrease or invariance of government expenditure on economic affairs reduces the potential of economic growth</td></tr>
</table>

Key: GDP – gross domestic product; GD – government debt; GEEA – government expenditure on economic affairs

In the variants different from described positive and negative ones, change of ratio of dynamics of GDP indicators, level of government debt and government expenditure on economic affairs will not lead to considerable changes of economic situation in the country.

In confirmation of the given conclusions the cluster analysis of the level of economic growth in the European countries during 2008-2014 is carried out (figure 3).

Figure 3. The cluster analysis of the level of economic growth in the European countries during 2008-2014.

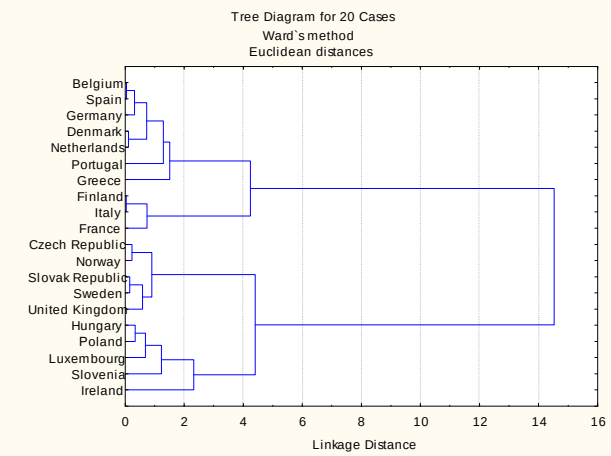


a) dendrogram b) rates of economic growth in separate clusters

The first cluster of the most stable economic growth has included 11 countries: Belgium, France, Norway, Hungary, Ireland, the United Kingdom, Germany, Sweden, Luxembourg, Slovak republic and Poland. The second cluster which is characterized by less considerable rates of economic growth consists of Czech republic, Netherlands, Slovenia, Denmark, Italy, Finland, Portugal, Spain. As shown in figure 4(b), their economic growth in 2014 is insignificant and averages about 1%. The third cluster is presented by Greece which had decrease in GDP throughout analyzed period and has reached insignificant economic growth only in 2014. The fact that the countries with the high level of government debt were included into both clusters is typical (and it reaffirms the made hypothesis about absence of direct negative influence of government debt level on economic growth): Belgium, France, Ireland and the United Kingdom are in the first one, and Italy, Portugal, Spain are in the second one.

For verification of the drawn conclusions concerning a contradictoriness of government debt increase one more cluster analysis is carried out considering not only economic growth but growth of government debt level and government expenditure on economic affairs in 2014 (fig. 4).

Figure 4. Results of the cluster analysis of the European countries considering economic growth, growth of government debt level and government expenditure on economic affairs in 2014



Thereafter 4 pronounced clusters are created (table 2).

Table 2: Verification of hypothetical conclusions about interrelation of economic growth and government debt

Number and members of cluster	Average values	Verification of hypothetical conclusions
1. Belgium, Spain, Germany, Denmark, Netherlands, Portugal, Greece	ΔGDP=1,14%; $\Delta\frac{GD}{GDP}$=5,70%; $\Delta\frac{GEEA}{GDP}$=1,88%	Positive value of all indicators was characterized as a neutral situation, however excess of government debt growth over GDP growth and government expenditure on economic affairs limits current and perspective economic growth (the lowest indicator of GDP growth is noted) – the conclusions are verified
2. Finland, Italy, France	ΔGDP=-0,20%; $\Delta\frac{GD}{GDP}$=9,31%; $\Delta\frac{GEEA}{GDP}$=0,57%	The respective set of situational signs was treated as a negative situation (growth of government debt in case of the actual invariance of the expense level on economy support and lack of economic growth), that confirms the adverse prediction for the countries of this cluster if the specified tendencies are preserved– the conclusions are verified
3. Czech republic, Norway, Slovak republic, Sweden, the United Kingdom	ΔGDP=2,42%; $\Delta\frac{GD}{GDP}$=2,69%; $\Delta\frac{GEEA}{GDP}$=5,49%.	The most favourable situation: the growth of expense level on economy support outgoes changes of GDP and government debt. Despite the growing borrowings, the countries are creating basis for future economic growth actively – the conclusions are verified
4. Hungary, Poland, Luxembourg, Slovenia, Ireland	ΔGDP=3,87%; $\Delta\frac{GD}{GDP}$=7,59%; $\Delta\frac{GEEA}{GDP}$=-4,49%	The highest growth of GDP which is followed by the outgoing growth of government debt and decrease of government expenditure on economic affairs. The situation was characterized as negative, however decrease of expenses on economic development in these countries is explainable – Hungary had the highest actual specific weight of government expenditure on economic affairs in 2014 (7,4% when the average level for the European countries is 4,2%); Slovenia in 2013 increased these expenses to the level of 15%, and in 2014 reduced it to the level of 5,7%; Ireland in 2010 allocated 25,4% of GDP for economic expenses, that was followed by reducing the rate. Luxembourg and Poland have slightly higher level rate of government expenditure on economic affairs than average and endanger economic growth in perspective.

The conducted researches revealed deviations from the prediction for 5 countries: Hungary, Poland, Luxembourg, Slovenia and Ireland. They are explained by considerable government expenditure on economic affairs for Hungary, Slovenia and Ireland in previous periods that provided them basis for economic growth at present. For Poland and Luxembourg practically the lowest level of added costs of non-financial corporations among the considered countries is typical that explains the insignificant share of government expenditure on economic affairs in the total volume of GDP and proves necessity of a further research of participation level of real sector for forming of economic growth rates.

4. CONCLUSION

Thus, the researches confirmed contradictory impact of government debt on economic growth. The following positive situations accelerating economic growth are singled out: the invariable or growing volume of government debt in proportion to growth of GDP on condition of observing the growth or preserving the expense level on economy support; the stable level of government debt in case of invariable GDP and increase in government expenditure on economic affairs gives the chance of potential economic growth. The negative situations slowing down economic growth are: the growth of government debt that outgoes the dynamics of GDP and government expenditure on economic affairs and limits the potential of economic growth; decrease in government debt in case of decrease in GDP causing shortage of funds for financing of government expenditure on economic affairs and guaranteeing of economic growth.

Considering the received results, a prospect of further researches is formation of the mathematical apparatus which allows to predict economic growth depending on government debt and proportions of its distribution in borders of the government expenditures depending on the industrialization level of the country.

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