

The analysis of causality of economic growth and public debt in Albania

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Abstract. Albania was able to maintain a level of economic growth and a macroeconomic stability during the last decade, but the high level of the public debt has had growing tendency during the last 5 years, thereby resulting to be enough concerning for a lot of foreign and native analysts in the field of economy. In this research we will study the role of public debt in the Albania's economic growth for the period 2003-2014, and also the defining factors for these indicators. To discover this causality relationship between the variables it is applied also the causality test Granger. From the Granger's analysis, we resulted that we are dealing only with one causality in one direction, that moves from the economic growth, that moves from the economic growth towards the public debt. The theory of co-integration is used to discover if the relationship among the variables is stable and in long terms periods in a manner that the taken politics in middle terms periods may be efficient also in long terms period.

Keywords: Growth, public debt, causality, long terms.

1. INTRODUCTION

At economical debates in regional and global level, the public debt is seen as an important indicator of the economy of a state because of the corelationship that it has with other economical factors. Exactly for this corelationship and for complexity that offers this topic, there exist a lot of arguments related with the role that the public debt has in the economic growth or vice-versa.

The stable economical growth has a vital importance for the economy of the whole states, especially for the states in development like Albania. The actual crisis of debts in Europe, undoubtedly has increased the attention of a lot of economists for the phenomena of the loan level from a lot of states in development or developed.

1.1 The theoretical relationship public debt-economical growth

The debt of the government is a debt from a central government, meanwhile the deficit of the government has to do with the difference among the receivebels and expenses of a government in one only year. The governments debt can be categorized as an internal debt (debt for the lenders inside the country) and the external debt (debt for the foreign lenders). Another usual division of the governments' debt, is by being based in the duration until its atonetment. The short term debt in general is considered to be for a year or less, the long term debt is for more than ten years. The middle term debt is in the middle of these two boundaries.

The relationship among the economical growth and the country's debt is a well discussed case from the economists. In this section, firstly we will give the definitions of the states' debt and the economical growth, at which we will be referred during the whole study in continuance.

The state's debt is the general amount of the state's debt emitted in the national coin and/or in different official coin from the national coin, which does not include the financial obligations of the municipalities/communes or any other authority of the local power.

Economical growth is the increase of the capacity of the economy of a country to produce goods and services in a defined period of time, compared to the previous period. The economical growth can be measured with nominal terms, in which is included inflation, or in real terms in which is not included inflation.

According to Elmendorf and Mankiw (1999) the states' debt is important for the effects itself that it brings, in the direct way or not, in the economy of the country. Firstly, the states' debt can effect on the monetary politics. A country with a high governmental debt is tends to face with high rates of interest, and the monetary authority can be situated under the pressure to decrease these norms through the monetary politics. This strategy can decrease the interest rates in the short term period, but in the long term period, there will be real interest rates unchanged and one inflation and nominal rates of inflation are higher. The increase of these two indicators, will be reflected in the reduction of the private investments, and as a consequence of internal bruto production (GDP) and the economical growth.

Secondly, the states' debt can effect over the political proces, which defines the fiscal politics. Some of the economists argument that the possibility of the loan of a government, decreases the discipline of the usage of the budget. With this one, we understand that if a governmet makes extra expenses, which are not related with the receivebles from the taxes, so the politicalmakers and the public concern less if these expenses are the right ones. The non-efficient usage of the extra funds in the consume goods and non-productive, from the side of the government, will be translated in a negative effect for the economical growth.

Thridly, the states' debt makes the economy af a country more touchable against an international crisis of faith. A high state debt makes pressure in the balance on a bank throughout some different channels. For example, it increases the financial costs of the financial institutions after the increases of the asset risk. The financial institutions, that hold a major part of the states debt of states with "economical stress", that are perceived as risked, they may need to pay higher rates of interests and might have difficulties in the increase of the funds in the whole market. They also can be found under potential pressure to increase the capital and liquidity. All these factors influence the increase of the cost of the debt service, which will negatively influence over the economic growth.

Lastly, according to Guraziu et al., (2012) the financial institutions can be confronted with capital exit and the substitution of the assets. All the above mentioned factors, show that a higher state debt affects in the decrease of the international faith of the country, and would affect the business climate, would affect in the decrease of investments and economic growth.

Related with the point of views for the debt, we can mention the Classics, who see the public debt as a burden for the society; the Neo classical point of view, that considers the public debt as a damage for the investments and economic growth; the Ricardian point of view that considers the state's debt as a tax for the future (Barro,1974); the modern economists, that see the public debt as a stimulant of the economic growth if the funds are used for productive aims, and the conventional point of view, in which the public debt stimulates the aggregate request in the short term period and stimulates the decrease of capital and national earnings in the long term period.

From the above theoretical literature, we can mention that the economists have not decided for the relationship that exists between the public debt and economic growth, even though dominates the thought for the negative relationship between them. From the conventional standpoint, over is based our study, we can say that the public debt has a positive effect over the economic growth in the short term period, and a negative effect in the long term period. So, the relationship between the public debt and the economic growth according to the conventional point of view, it takes the shape of an overturn u, defined from the economists like Laffer curve.

1.2 The mechanisms of the transmission of the public debt growth in the economic growth.

There exists different channels in which one increase (decrease) of the public debt can make a negative (positive) effect over the economic growth in the long term. Three main channels are:

1. Net savings channel

- One increase of the public debt generally corresponds with one decrease of the volume of national net savings (which before the public debt increased would be used for investments, after the increase will be used for financing the service cost of the public debt).
- One decrease of the national net savings, influences the increase of the interest rates, and these last effect on the decrease of the investments and decrease in the capital stock growth.
- The decrease of the capital stock growth will effect negatively in the new technology, which will bring the decrease of the job productivity. The final effect of this channel: the decrease of GDP (the decrease of the economic growth).

2. The channel of the service cost of the debt

- One decrease of the public debt, leads in the increase of the service costs that will effect in the decrease for the public investments and the increase of the capital taxes and the work (should finance this increase of the public debt).
- The increase of the capital taxes makes to decrease the capital stock in nation and to stop the native and foreign investors that want to expand their activity (less investments in infrastructure, education, healthcare etc., the place is less preferred for direct foreign investments /IHD).
- The increase of work taxes, will decrease the job offer, and can affect the increase of informal economy and fiscal evasion. Also will decrease the buying power of the consumers (less consume, less sale for businesses, and less taxes to be allocated for the states' budget).

All these factors influence to decrease the GDP (as a consequence the economic growth).

3. The channel of the national trust

- The increase of the public debt brings to the increase of the interest rates for the individuals or firms (less request for credit from the businesses and individuals).
- The effect of the interest norms is helped from factors like: weak institutions, low private savings, low competition, high unemployment and weak banking system (the categorization of the country as “ a country with risk”, would be offered higher norms of interest to loan foreign capital).
- **The increase** of interest rates means also less public or private investments, that brings a low GDP.

1.3 The review of the literature over the relationship of debt with the economic growth

Different authors have realized a lot of empirical analysis to study the vice-versa relationship between the debt and the economic growth. A lot of them have discovered that higher levels of states' debt have a negative effect in the economic growth in the countries in development, whereas others have discovered the positive relationship between them. Based on this relationship, is being classified also the found literature.

a) Negative relationship between the states' debt and the economic growth.

Pattillo CH., Poirison H., Ricci L., (2002) analysed 93 countries in development for the period 1969-1998. The authors used the dynamic model with panel data with fixed effects, and concluded that the external debt had a negative impact in the economic growth for values of debt over 35-40 % of GDP.

- In another study (2004), they retested the non-linear effects of debt in the economic growth by studying a high number of countries in development (61) for the same period of time. The methodology of evaluation was the one of OLS. It was discovered that the negative impact of the public debt has a strong effect in the accumulation factor of physical capital and the one of increase of the total productivity of production factors.
- Alfredo Schclarek (2004) discovered that existed one negative impact linear of the external debt over the economic growth that comes from the effect in the accumulation of physical capital, after studied 59 countries in development and 24 industrial countries, for the period 1970-2002. The methodology used was GMM applied over the panel data.
- Kumar and Woo (2010), studied the impact of the public debt over the long term economic growth, based on a panel of 35 developed states and in develop for the period 1970-2010. It is confirmed one non-linear relationship between the public debt and economic growth (for values over 90% of debt) that is reflected from the decrease of the investments and the decrease of the capital stock growth per labor, and these last influenced in the decrease at the productivity of work.

b) The positive relationships between the debt and economic growth.

- Patrizio Lainà (2011) studied the dynamic relationship of the public debt and the economic growth in USA for the period 1959-2010. The methodology used was the one of SVAR, the causality test Granger, the impulse-reaction test, VECM etc. The author concluded that the public debt had a positive effect over the economic growth in the short term period, and a negative effect in the long term period.
 - Abbas and Christensen (2007) studied the role of the internal economic growth, by including 93 countries with low incomes for the period 1975-2010. The methodology used was the one of fixed effects OLS and GMM. The results of the study showed that the internal debt played an important role on the support of the economic development for the countries with low incomes.
 - Maana et al. (2008) analysed the economic impact of the internal debt in the economy of Kenya. The authors used the method OLS by using annual data for the period 1996-2007. The results showed that the increase of the internal debt has statistically a non-important positive effect over the economic growth.
 - Sheikh et al. (2010) studied the impact of the internal debt over the economic growth in Pakistan. The methodology used was the one of OLS for the period of 1972-2010. The study showed that the stock internal debt influenced positively over the economic growth in Pakistan.
 - Uzun et al. (2012) used the autoregressive model with spreaded lateness (ARDL) to study the relationship between the debt and the economic growth for the countries in transition, in the period of 1991-2009. They came to the result that exists one positive relationship between the debt and economic growth in the long term period.
- So, according to the empirical literature from most of the studies, exists a non-linear concave relationship (in U shape inverted). These studies have discovered that high levels of states' debt have a negative effect in the economic growth at countries in development (Pattillo et al., 2002; Pattillo et al., 2004; Schclarek, 2004; Kumar and Woo, 2010; Patrizio Lainà, 2011). Meanwhile, other empirical studies have concluded for a positive role of the public debt over the economic growth (Abbas and Christensen, 2007; Maana et al., 2008; Sheikh et al., 2010; Uzun et al., 2012). These results might have come as a consequence of

the different used empirical methods , different contexts, different period of times, or other factors that we have not analysed at our study.

2.THE DEBT AND ECONOMIC GROWTH IN ALBANIA

2.1 Economical growth

During the last two decades, the albanian economy has suffered some important structural changes, which have fortified the stimulations for a stable economic growth. Albania has kept under the controll the decrease of the native product since the economic crisis was appeared in Europe, ot kept a stable and low inflation, kept a stable banking system, and all these because of fiscal stimulation and a very careful aand effective monetary politics. The two last years in Albania, it is being noticed the macroeconomic disbalances continue to put pressure for the economy in whole, by running as stopers for the economic growth in the country.

The applied politics in Albania during year 1993 with the aim of macroeconomic stabilization of the country, helped in the stable economic growth.

At the graph 3.1 is presented the tendency of the economic growth in Albania during years 1992-2013.

Graph 3.1: *The economic growth in Albania during 1992-2014*



Source: The bank of Albania

2.2 The public debt

The last analysis of the trend of the public debt during 1992-2014, can be separated in four main phases.

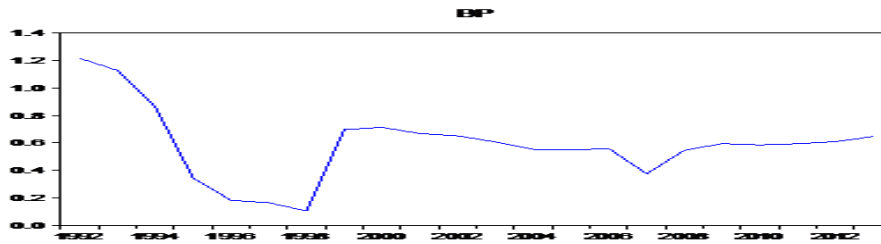
Firstly, during the period of 1992-1995 we have a strong decreasing tendency of this indicator. This tendency of the debt can be explained with the fact of the decrease of budget's deficit, budget's expenses, and the improvement of the capital account. Regarding the relationship between the public debt and the economic growth, in this period we see a negative relationship between these two indicators.

Secondly, during the period of 1995-1996 we have an increase of the level of public debt.

Thirdly, during the period of 1996-2002 we have a non stable behavior of the public debt, that has come as a consequence of the instability of the budgets' deficit, the increase of the internal debt and the instability of the external debt.

Fourthly, during the last decade (2002-2013) we have a stable behavior of the public debt, with a mainly decrease tendency until 2007, and increase until 2012.

Graph 3.2: The public debt in Albania during 1992-2014. (%)



Source: The bank of Albania

2.3.The empirical analysis

Data

The data are annual, taken from the Bank of Albania, and include the period of 2003-2014. The selected period of time coincides with the data available from the official institutions which won these data.

2.3.1 The testing of stationarity of time series.

A series to be named stationary it is need that the mathematical expectation, variance and covariance to be:

c) The test of unitary roots

Stationarity

As the taken variables in this study are time series, we cannot continue further with the analysis without studying their stationary.

According to the classical definition, a time series is stationary if the mathematical expectation, variance and covariance should be constant (not depending on time t). In this analytical way we can write:

$$E Z(t) = \mu$$

$$Var (Zt) = \sigma^2$$

$$cov (z_{t+k}, z_t) = \gamma_k \text{ per } k=1,2,\dots$$

The most used test to study the stationary is Dickey-Fuller generalized ADF(p), which is a asymptotic test to show the existence of the unitary roots.

By referring the model:

$$\Delta Z_t = \beta_1 + \beta_2 t + \delta Z_{t-1} + \sum_{i=1}^p \gamma_i \Delta Z_{t-i} + u_t ,$$

The hypothesis are constructed:

$$H_0 : \delta = 0 \text{ (Equivalent with the existence of the unitary roots)}$$

Alternative hypothesis: $H_1 : \delta < 0$ (Time series is stationary)

Ne tabelen e meposhtme jepern rezultatet e testit per variabla qe ne kemi marre ne studim.

Hypothesis	ADF T stat	Critical value 1%	Prob	Result Hypothesis	Result
Growth has a unit root	-2.84	-3.65	0.1565	Non reject	I(1)
D(Growth) has a unit root	-4.220		0.0020	Reject	
BP has a unit root	-2.82	-3.65	0.0652	Non reject	I(1)
D(BP) has a unit root	-13.7		0.0000	Reject	

Source: The authors' work

At the table we see that the value of statistics Student per growth which is used to test the hypothesis of the existence of the unitary roots is -2.84 and is bigger than the tables' critical value, one-sided given with level of importance 1%.

So we can say that the series Growth has a unitary root and as a consequence it cannot be a stationary series, this series has a defined tendency in time.

Analysis continues on the first series difference of Growth. After it is known that the series is not stationary when no differentiation using ITS to turn in stationary. The number of differences to be used for return to a stationary series provides theoretically and order of stationary or the order of differentiation.

As seen Statistical value student is smaller than the hypothesis of critical values and consequently falls down . We can say that the growth time series is not a stationary series, but it turns into a difference stationary and stationary we may call a first order integral wound of a First -Time Order I (1).

The same path is followed even for the other series of public debt series which emerges a non-stationary series.

2.3.2 The Granger causality test

To test whether an economic indicator begs another, in help ts comes a standard test Granger causality (Granger, 1988), which tries to determine how the values of a variable past help in predicting changes in the other variable .Reportedly, Granger variable Y is the result of the variable X, if variable X helps to predict the value of variable Y. It is important to note that the word "Granger cause" does not mean that the indicator caused is an effect or result of the indicators it causes. This after Granger mat causality information precedents and dynamic composition of a series of time and causality does not mean literally.

In economic analysis a problem that often occurs is the definition of variable causality and the determine of the consequence variable. One such problem analyzes Granger theory which is based on the models VAR (p). Granger test empirically reveals links that exist between the variables in the short term. Are referring to the simplest case, the model VAR (p) 2 dimensional variables and Z2t Z1t, the general shape of which is:

$$\begin{cases} Z_{1,t} = \sum_{i=1}^p \alpha_{1i} Z_{1,t-i} + \sum_{i=1}^p \alpha_{2i} Z_{2,t-i} + \varepsilon_{1,t} \\ Z_{2,t} = \sum_{i=1}^n \beta_{1i} Z_{1,t-i} + \sum_{i=1}^n \beta_{2i} Z_{2,t-i} + \varepsilon_{2,t} \end{cases}, \text{ residues are white noise.}$$

In this model , if we refer to the first equation ,it shows that as the dependent variable is Z1t in α_{2i} if all the coefficients will be zero , then the variable does not affect the variable Z2t Z1t (in language test does not cause) .

If we refer to the second equation, it shows that as the dependent variable is Z2t in β_{1i} if all the coefficients will be zero, then the variable does not affect the variable Z1t Z2t (language test does not cause) .

Causality can be determined by evaluation of equations 1 & 2 and test the following hypotheses:

$$\text{Zero hypothesis : } \sum_{i=1}^p \alpha_{2i} = 0 \text{ and } \sum_{i=1}^n \beta_{1i} = 0$$

Against the alternative hypothesis that the at least one of the above two amounts is different from zero .

If basic hypothesis falls below we may encounter the following cases ::

1. $\sum_{i=1}^n \beta_{1i} \neq 0$ and $\sum_{i=1}^p \alpha_{2i} = 0$, In this case we can say that exists a causality cause one sided and exactly Z_{1t} causes the variable Z_{2t} .

2. $\sum_{i=1}^p \beta_{1i} = 0$ and $\sum_{i=1}^p \alpha_{2i} \neq 0$, in this case we can say that exists a causality cause one sided and exactly Z_{2t} effects the variable Z_{1t} .
3. $\sum_{i=1}^p \beta_{1i} \neq 0$ and $\sum_{i=1}^p \alpha_{2i} \neq 0$, in this case we say that mutual causal relation and exactly Z_{2t} and Z_{1t} cause each other.

Test results for the variables in the study are presented in the following table:

Basic hypothesis	Lag 2	Lag 3
BP does not casuale growth	0.06452 0.80798	0.21740 0.81626
Growth does not casuale BP	10.1228 0.01904	4.40965 0.12788

Table. The results of Granger test . Authors' work.

Among the variables in the study there exists the causal unilateral relation and precisely variable changes in real economic growth lead to significant changes in the variable of public debt . So the economic growth is the cause of the public debt and consequence.

2.3.4 Cointegration

The method of maximum likelihood Johansen (1988) is probably the best method for assessing the long-term economic variables and relationships. Many studies of a lot of researcher have made comparisons around different approaches to cointegration analysis and are generally in favor of this method. Although it should be noted that it is necessary for each case study of time series. Johansen method is very useful when a large number of observations and model is good when the remains are not autocorelate .

Author for testing hypotheses is using two tests:

Statistics traice $\lambda_{\text{trace}} = -n \sum_{i=r+1}^k \log(1 - \hat{\lambda}_i)$

Statistics of its maximum value $\lambda_{\text{max}} = -n \log(1 - \hat{\lambda}_{r+1})$

1. The test of traice

Ho: $r \leq r_0$

Ha: $r_0 < r \leq k$

If $\lambda_{\text{trace}} > \text{critical value}$, then the basic hypothesis swoop .

2. The test of its maximum eigen value Ho: $r \leq r_0$

Ha: $r = r_0 + 1$

If $\lambda_{\text{max}} > \text{critical value}$, then the basic hypothesis swoop .

In both cases, testing is implemented sequentially.

Sequentially tests¹:

- i. $H_0: r = 0$, cannot be refused \rightarrow end
Ha: $r > 0$, true \rightarrow we continue the test
- ii. $H_0: r = 1$, cannot be refused \rightarrow end $\rightarrow r = 1$
Ha: $r > 1$, true \rightarrow we continue the test

Testing continues until we reach the maximum value of r , r is known that takes values in the segment $[0, k-1]$.

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.641883	83.41951	47.85613	0.0000
At most 1 *	0.482277	44.39744	29.79707	0.0006

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* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.641883	39.02207	27.58434	0.0011
At most 1 *	0.482277	25.01599	21.13162	0.0135
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Based on the results of the test, there are seen that the taken series available have sustainable relation in long term periods.

CONCLUSIONS:

The relationship between economic growth and public debt is a very controversial issue by economists.

There are different channels in which an increase (decrease) of public debt may have a negative effect (positive) economic growth within the long term periods.

The main channels are:

1. Channel of net savings 2. Channel of debt service cost 3. Channel of nation credibility
Various authors have conducted numerous empirical analysis to study the mutual relationship between debt and economic growth. Many have discovered that high levels of state debt have a negative effect on economic growth in developing countries, while others have found positive relationships between them . On the basis of this relationship is classified the found literature.

Analysis of public debt over the years 1992-2013, can be divided into four main phases.

First, during the period 1992-1995 we have a strong downward trend of this indicator.

Secondly, during the period 1995-1996 we have increased the level of public debt to about 24% of GDP, attributable to the increase of the budget deficit and other factors.

Thirdly, during the period 1996-2002 we have an unstable behavior of public debt, which has been due to the instability of the budget deficit, rising domestic debt and external debt unsustainability. Fourth, over the last decade (2002-2013) we have a more stable public debt.

The model we built resulted important. Remains have normal distribution. Series both are non-stationary in long term GDP and BP are not in balance. The year 2007 is the breaking point. According to the authors Glejser and BPG our model of heteroskedasticity does not suffer. Granger test shows that BP causes BPP, by giving the answer to our question

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