International Journal of Economics & Management Sciences

Daniela, Int J Econ and Manage Sci 2015, 4:2
DOI: 10.4172/2162-6359.1000226

Mini Review Open Access:

Analyzing the Impact of Gross Domestic Product Growth Rate on Inflation: Short Empirical Study for the Romanian Economy

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Received date: July 18, 2014; **Accepted date:** January 20, 2015; **Published date:** January 30, 2015

Abstract

This paper aims to analyze the impact of Gross Domestic Product growth rate on inflation in Romanian economy for time series data between 2000 and 2013. The research methodology used is the method of least squares and the results show that there is a strong relationship between the two variables. Also there are other factors that may impact on the evolution of inflation (unemployment rate, the reference interest rates, supply and demand for currency, etc.), factors that I will consider in a future analysis.

Keywords: Gross Domestic Product; Inflation, Economic growth; Least squares

Introduction

Gross Domestic Product (GDP) is an indicator representing the quantitative and qualitative evolution of the economy of a country in a given period of time.

Inflation is the significant and persistent increase in prices in a given period of time.

The most important measures of inflation are:

- Consumer price index (CPI) which measures prices of a basket of goods that are significant in terms of the expenditure incurred by a household, based on a representative sample established by the National Institute of Statistics.
- Production price index (PPI) is the change in prices before the final stages.
- General price index (IGP) considers all prices in the economy, including those imported.
- The GDP deflator is the price of the goods included in GDP and is calculated as the ratio between nominal GDP and real GDP.

One of the most common theories in economic literature shows that there is a direct correlation between the economic growth and the inflation. On the one hand are accepted as suitable low levels of inflation for a stable economic environment, while maintaining a sustainable economic growth [1].

On the other hand are accepted as suitable low levels of inflation for a stable economic environment, while maintaining a sustainable economic growth [2].

We take the definition of inflation hypothesis, in the sense that an increase in production of goods and services would attract less pressure for money in the market of goods and services therefore stabilization or even a decrease in the level of inflation [3]. To test the above hypothesis we conducted an empirical test for the Romanian economy, by measuring levels of quarterly inflation and the rate of change of the values of GDP during 2000-2013. The data series used are data published by National Institute of Statistics in Romania (www.insse.ro) and EUROSTAT.

Data are for the period 2000-2013 and takes into account the average quarterly inflation rate [4], GDP quarterly growth rate in both level values, and the gap.

Dependent Variable: INF_T_PROC				
Method: Least Squares				
Date: 05/12/14 Time: 01:38				
Sample: 12/01/2000 12/01/2013				
Included observations: 53				
INF_T_PROC = C(1)+C(2)*DVOL_PROC+C(3)*DVOL1_PROC				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.021819	0.003882	5.621274	0
C(2)	0.554588	0.243793	2.274832	0.0272
C(3)	0.388102	0.241317	1.608263	0.1141
R-squared	0.219553	Mean dependent var		0.030511
Adjusted R-squared	0.188335	S.D. dependent var		0.025137
S.E. of regression	0.022646	Akaike info criterion		-4.682687
Sum squared resid	0.025643	Schwarz criterion		-4.571161
Log likelihood	127.0912	Hannan-Quinn criter.		-4.639799
F-statistic	7.032928	Durbin-Watson stat		1.090996
Prob(F-statistic)	0.002035			

Table 1: Author's own calculation via Eviews application.

We applied a simple, direct regression of quarterly inflation rate depending on the level of GDP growth (value-simultaneous and gap). Initial tests suggest that levels of GDP growth with a lag of more than one quarter are not significant for the model and the results of estimating inflation by GDP growth (value-simultaneous and lag 1) are:

The research methodology used is the method of least squares, using the research tools excel and Eviews applications (Table 1). GDP growth rate has a positive impact on inflation because the coefficient C(2) is statistically significant for a confidence interval of 95%.

There is a strong relationship between the two variables, meaning that an increase of 1% in GDP level will lead to a 0.55% increase in the level of inflation [5].

If we consider an average growth rate of 3-4% of GDP, it will lead to an increase of 1.5-2% in inflation level, ratio that can be regarded as high.

R2 is 0.219 meaning that only 21.9% of variation of 0.55% inflation rate increase of 1% of GDP is explained by the model.

The remaining 78.1% is attributed to other factors that were not included in the model (unemployment, money supply, economic growth indicators) and will be considered for future research.

Acknowledgement

This work was co-financed from the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, project number POSDRU/159/1.5/S/134197 “Performance and excellence in doctoral and postdoctoral research in Romanian economics science domain”.

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