TENDENCIES REGARDING THE INTERNAL AND EXTERNAL GOVERNMENTAL PUBLIC DEBT IN ROMANIA

ANA-PETRINA PĂUN, PETRE BREZEANU [*]

ABSTRACT: *Starting from the certitude that the resources are limited, the state in its desire to assure a minimum life standard for its citizens, to create jobs, to invest in infrastructure and in other purposes effectuates expenses which exceed the revenues, which in term determines the budget deficit. Financing the budget deficit involves calling for the resources of the internal and external financial markets, thus creating the internal and external public debt. The modality in which the state manages the public debt has represented and continues to represent a subject of actuality and the discussions regarding the level of budget deficit, the degree of indebtedness and its implications in the social wealth are permanently addressed. In this paper it is presented the evolution of the internal and external governmental public debt indicator between 2000 and 2014 and also its predictions between 2015-2020. The indicators' evolution is highlighted with diagrams which are processed with the help of the EViews software, and for realizing the forecasts, a mono-variable will be used, specific to economic systems of the type SISO (Single Input – Single Output), more precisely an autoregressive seasonal model integrating moving average ARMA. The parameters' values are estimated with the help of least squares method. The input variable is the period of time (2000-2014), and the output variable is the indicator for internal governmental public debt and for external governmental public debt. In the wake of proceeded analyses we can conclude the fact that the indicator of internal and external governmental public debt had an ascending trend between 2000-2014, and for 2015-2020 it is also forecast an ascendant evolution.*

KEY WORDS: *internal governmental public debt, external governmental public debt, budget deficit.*

JEL CLASSIFICATION: *H62, H63.*

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Starting from the certitude that resources are limited, and needs are unlimited one can observe the arrival to a resource deficit. Financing the deficit involves a call for resources from external and internal financial markets, moment in which the internal public debt and also the external public debt are created.

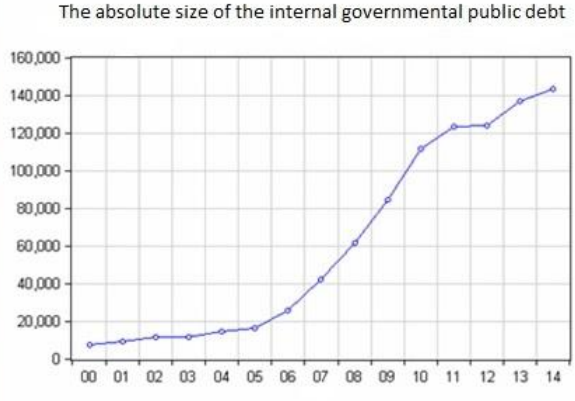
Văcărel I. and collaborators (2007) consider that "the internal public debt represents the totality of state obligations, proceeded from loans contracted directly or guaranteed by the state, from physical or juridical persons, in lei or foreign currency, from the internal market, including the amounts received temporary from the State Treasury resources". Moșteanu T. and collaborators (2008) considers that "external public debt is generated by the totality of obligations assumed directly or indirectly by the state to foreign governments, international financial institutions, physical and non-resident juridical persons".

In the following we will present the evolution of external and internal governmental public debt indicators between 2000-2014 with diagrams which are processed with the help of EViews software and also its previsions for the period of 2015-2020.

1. TENDENCIES REGARDING THE INTERNAL GOVERNMENTAL PUBLIC DEBT IN ROMANIA

In Figure 1 it is represented the evolution in time of the absolute size of the internal governmental public debt (IGPD). As we can see it has an ascending trend. Simoultaneously one can easily see the fact that the greatest increase of the internal governmental public debt level that has been registered between 2006-2010, the period which corresponds with the pre-aderation of Romania to the E.U., post-aderation to the E.U. and lastly with the world financial crisis, all three consuming financial resources.

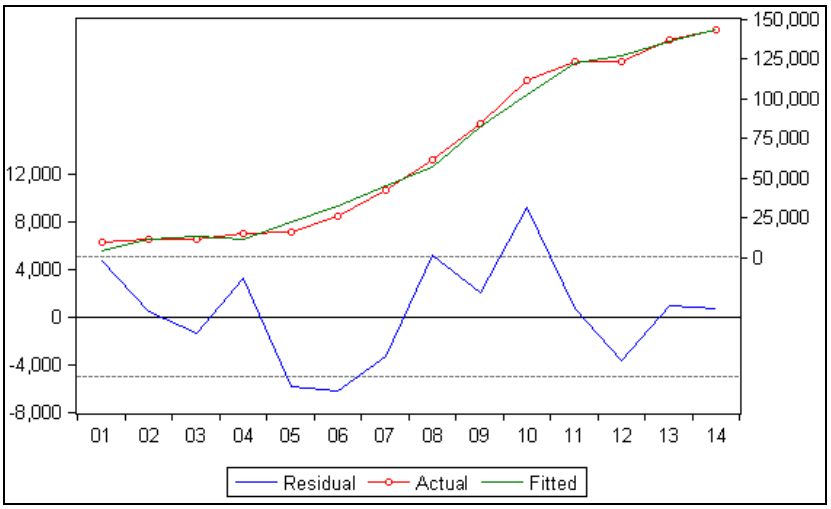
Year	DPGI [mil. lei]
2000	7.452,80
2001	9.185,40
2002	11.620,70
2003	11.510,10
2004	14.562,80
2005	16.128,00
2006	25.827,30
2007	41.827,50
2008	61.523,10
2009	84.352,00
2010	111.600,00
2011	123.101,40
2012	123.531,20
2013	136.554,70
2014	143.452,94



Source: Author processing based on data provided by MFP – The structure of public debt 2000-2014

Figure 1. The evolution in time of absolute size of the internal governmental public debt (DPGI)

The model with the help of which we will determine the forecasts for internal governmental public debt, is a model type ARMA. In figure 2 it is presented the variation in time of the real internal governmental public debt, in tandem with the variation in time of the ARMA model, pointing out the residual value.



Source: Author processing

Figure 2. The variation in time of the real serie DPGI (red), in tandem with the estimated variation in time of ARMA model (green), making evident the residual value (blue)

One can note the fact that the realised estimation of the public debt evolution coincides, in a very big procentage, with the real evolution of it and that the small oscillations registrated by the real evolution of public debt fit in the accepted error of evolution estimation.

In the next chart, we can see in the second column the estimated values of the ARMA model's parameters. Also, the quality of the estimated values of ARMA model's coefficients (the value R-squared has a very close value to 1), as well as for the applicated test values, it is a very good one.

In figure 3 the evolution in time of the predicted values for the DPGI indicator it is represented after the vertical line (black). As it can be seen this has an ascending evolution for the period submited to forecast. The predicted values are represented in chart 1.

Based on the predicted forecasts it can be noticed the fact that the internal governmental public debt has an ascending trend arriving at the level of year 2020 to 237,5 billion lei.

Chart 1. The estimated values of the ARMA model parameters for the internal governmental public debt

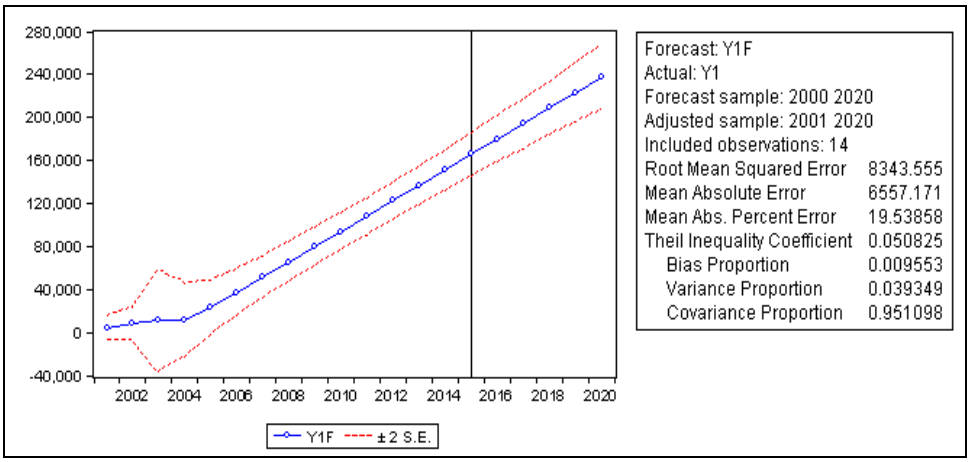
Dependent Variable: Y1
Method: Least Squares
Date: 04/25/15 Time: 15:02
Sample (adjusted): 2001 2014
Included observations: 14 after adjustments
Convergence achieved after 18 iterations
MA Backcast: 1997 2000

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ANI	14410.00	1458.952	9.876948	0.0000
C	-28870650	2935156.	-9.836155	0.0000
AR(1)	0.633621	0.197915	3.201487	0.0095
MA(4)	-0.906668	0.094093	-9.635883	0.0000

R-squared	0.993201	Mean dependent var	65341.22
Adjusted R-squared	0.991162	S.D. dependent var	52960.63
S.E. of regression	4978.882	Akaike info criterion	20.09875
Sum squared resid	2.48E+08	Schwarz criterion	20.28134
Log likelihood	-136.6913	Hannan-Quinn criter.	20.08185
F-statistic	486.9699	Durbin-Watson stat	1.522853
Prob(F-statistic)	0.000000		

Inverted AR Roots	.63			
Inverted MA Roots	.98	-.00+.98i	-.00-.98i	-.98

Source: Author processing



Source: Author processing

Figure 3. The evolution in time of the predicted values for the serie DPGI (blue), making evident the reliance interval (red)

Chart 2. The predicted values of internal governmental public debt

Years	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Val. predict. for DPGI [mil.lei]	165.518,7	179.919,3	194.323,3	208.729,6	223.137,2	237.545,7

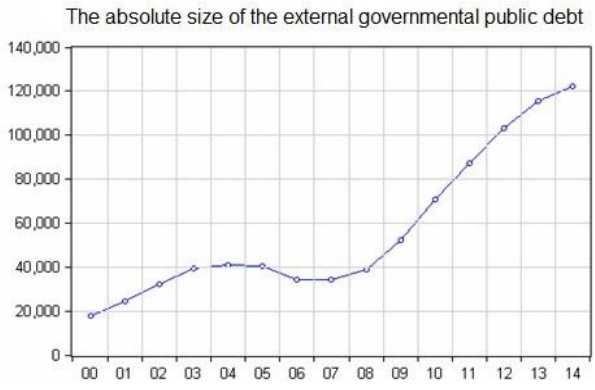
Source: Author processing

2. TENDENCIES REGARDING THE EXTERNAL GOVERNMENTAL PUBLIC DEBT IN ROMANIA

The evolution in time of the absolute size of external governmental public debt (DPGE) is represented in figure 4. As it can be seen this has a nonlinear evolution, with an evident growth year after year, starting from 2007.

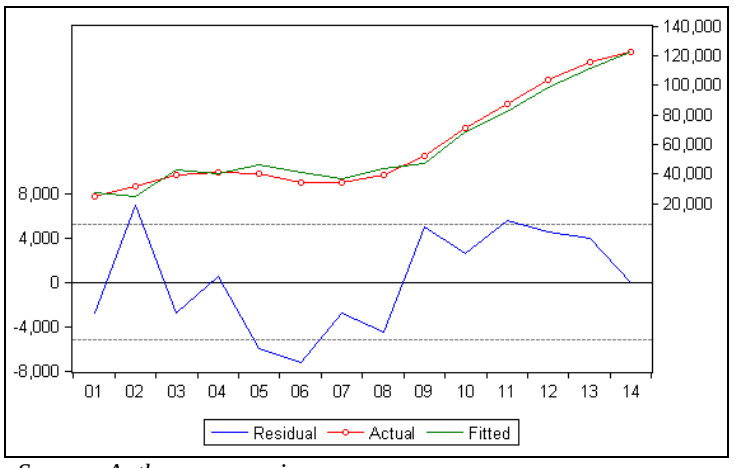
The model with the help of which we will determine the indicator forecasts, is an ARMA type model. In figure 5 presents the estimated variation in time of ARMA model, highlighting the residual value.

Years	DPGE [mil. lei]
2000	17.765,80
2001	24.296,70
2002	31.994,57
2003	39.610,54
2004	40.771,90
2005	40.285,69
2006	34.024,10
2007	34.320,28
2008	39.030,18
2009	52.141,80
2010	70.910,30
2011	87.300,00
2012	103.310,60
2013	115.625,10
2014	122.200,66



Source: Author's processing based on the data provided by PFM – The public debt structure 2000-2014

Figure 4. The evolution in time of the absolute size of external governmental public debt



Source: Authors processing

Figure 5. The variation in time of the real serie DPGE (red), in tandem, with the estimated variation in time of ARMA model (green), making evident the residual (blue)

In chart 3, one can observe in the second column the estimated values of the ARMA type model's parameters. Also, the quality of estimated values of the ARMA model's coefficients (the value R-squared has a very close value to 1), as well as the applicated test's values is a very positive one.

In Figure 6, the evolution in time of the predicted values for the indicator external governmental public debt it is represented after the vertical line (black). As it can be seen, this has an ascending evolution for the entire forecast periode. The predicted values are represented in chart 4.

Chart 3. The estimated values of the ARMA model's parameters for the external governmental public debt

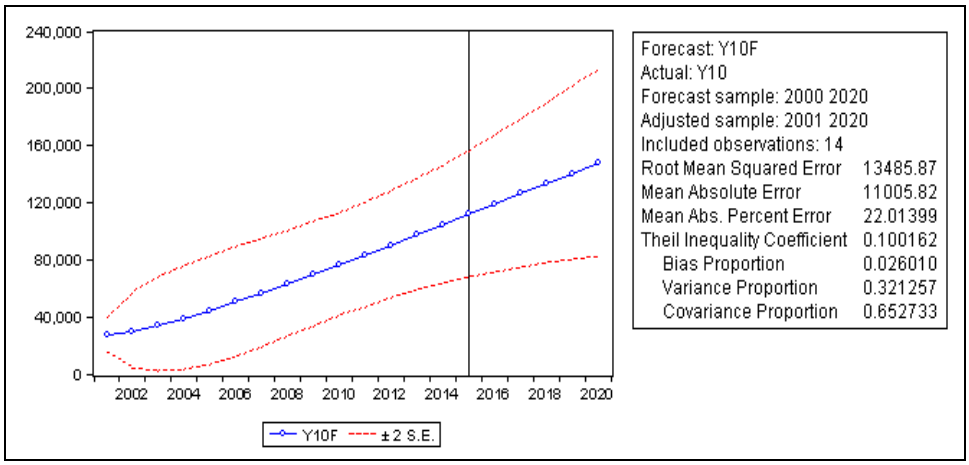
Dependent Variable: Y10
Method: Least Squares
Date: 04/24/15 Time: 16:39
Sample (adjusted): 2001 2014
Included observations: 14 after adjustments
Convergence achieved after 11 iterations
MA Backcast: 2000

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ANI	7259.932	3017.871	2.405647	0.0370
C	-14517311	6069466.	-2.391859	0.0378
AR(1)	0.751047	0.188100	3.992803	0.0025
MA(1)	0.999944	0.154308	6.480197	0.0001

R-squared	0.981293	Mean dependent var	59701.60
Adjusted R-squared	0.975681	S.D. dependent var	33707.76
S.E. of regression	5256.561	Akaike info criterion	20.20730
Sum squared resid	2.76E+08	Schwarz criterion	20.38989
Log likelihood	-137.4511	Hannan-Quinn criter.	20.19040
F-statistic	174.8547	Durbin-Watson stat	1.396481
Prob(F-statistic)	0.000000		

Inverted AR Roots	.75
Inverted MA Roots	-1.00

Source: Authors processing



Source: Author's processing

Figure 6. The evolution in time of the predicted values for the DPGE size (blue), emphasizing the reliance interval (red)

Chart 4. The predicted values of the external governmental public debt

Year	2015	2016	2017	2018	2019	2020
Val. predict. for DPGE [mil. lei]	111.766,4	118.948,0	126.149,2	133.365,0	140.591,7	147.826,8

Source: Authors processing

Based on the predicted forecasts it can be observed the fact that the external governmental public debt will reach in 2020 a level of 147,8 billion lei.

3. CONCLUSIONS

Based on the facts presented previosly we can conclude that in the analysed period 2000-2014 the internal governmental public debt had an ascending evolution, respectively from 7,4 billion lei at the level of the year 2000 to 111,6 billion lei, the level of the year 2014. Also one can easily observe the fact that the biggest growth of the level of internal governmental public debt has been registered between 2006-2010, a period corresponding with the pre-aderation of Romania to E.U., post-aderation to the E.U. and not the least with the world financial crisis, all three of them being financial resources consumers.

Utilising the mono-variable model specific to SISO type (Single Input – Single Output) economic systems, more precisely the seasonal autoregressive model integrated moving average ARMA, for the period 2015-2020 there have been forecasts for the internal governmental public debt. Based on the estimated previsions it can be observed that the internal governmental public debt has an ascending tendency arriving at the level of the year 2020 of 237,3 billion lei.

Regarding the external governmental public debt, between 2000-2014, it had a non-linear evolution, with an ascending trend starting from 2007. In 2014 the external governmental public debt had reached the level of 122,2 billion lei.

Using the autoregressive seasonal model with integrated ARMA moving average, for the period 2015-2020 forecasts have also been made for the external governmental public debt. Based on the effectuated forecasts it can be oserved that the external governmental public debt has an ascending tendency arriving in the year of 2020 to 147,8 billion lei.

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