APPRECIATIONS REGARDING THE PREDICTION OF THE GROSS DOMESTIC PRODUCT IN THE PERIOD AFTER ROMANIA'S ADHERENCE TO THE EU

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Abstract: The paper proposes to present a picture of the evolution of the GDP in the immediate period after Romania's adherence to the European Union. In order to do this we find necessary a retrospective of the dynamics of this macroeconomical indicator in the period before the adherence. Thus, in the first part of the paper it is realized an analysis of the dynamics per total of the GDP but also per the components which enter its calculation through the final use method. In the second part, based on the obtained results, we determine the trend, we elaborate prognoses and analyze the rhythm of the dynamics and each component's contribution to the GDP's general dynamics.

Key words: gross domestic product, final consumption, gross fixed capital formation, net export

Introduction

Romania's economical integration in the European structure supposes political, economical and reforms who need, in order to be viable, an absolute type of informational system, which through objectivity, should allow concomitantly the connection at European level.

Any economical program contains a set of political measures destined to achieve the main objectives of the macroeconomical politics, which - usually - are the following: the economical growth, the occupation of the work force, the stability of prices and of the external payments balance.

These objects are quantified through four fundamental variables, also called key macroeconomical variables, through which we measure, correlate and analyze each economy's performances: the increase rhythm of GDP; the unemployment rate; the inflation rate and the surplus stock payment balance current account.

The macroeconomical results indicators have a large utilization for international comparisons, for the correct comprehension of the phenomena and processes from the world economy, of the international economical interdependences, of the country's participation to the world economical circuit.

Within these macroeconomical indicators, the GDP as aggregate which represents under a synthesized form the quantitative and qualitative evolution that a country registers during one year time, plays an important part in the appreciation of the economical growth of a country. In accordance to its level we can adjust the economical politics, we can make comparisons between different countries etc.

All these considered we can believe as necessary an analysis of the dynamics of this indicator, especially in the context of complying the criteria of adherence with the European Union.

The forecast represents the practical activity through which we anticipate the probable evolution of some phenomena, influenced by certain elements: the previous experience and the contoured tendencies; present and durable requirements; predictable changes; the risk margin; the suggestions offered by the prospective studies.

The prognosis is the instrument of the forecasting activity and it can show which are the future implications of the tendencies, how they can influence other factors also (besides the tendencies), what advantages are there, what is the optimal variant and how we should defalcate the objectives from the prognosis on instruments which act on short terms.

Based on the statistical data from the period previous to the adherence moment we will elaborate and analyze also the prognosis regarding the evolution of the GDP and of the elements which enter its calculation through the final use method, during 2007-2010.

In the case studies regarding this indicator's dynamics, the presentation of the diagrams with the evolution and with the general trend and also the elaboration of prognoses, we will use modern methods of processing and analysis of the statistical data, implemented with the statistical analysis program MINITAB 14.1.

Tendencies in the dynamics of Romania's Gross Domestic Product realized during 2000-2006

The macroeconomical results are the outputs from the activities of the aggregated economical agents that the market validates, the society recognizing their utility in satisfying the multitude of social needs.

Also, based on them we make international comparisons, regarding the economical potential, the efficiency and the competitiveness of the economical products produced in different countries of the world, we establish each country's place in the world hierarchy.

The system of the National Accounts is the essential instrument for collecting numerical and quantification data, in a synthetic, simplified form, of the main operation from the national economy. These data allow the knowledge and characterization of the main variables such as: the domestic product, the national product, the national income, the final consumption, the formation of the capital, the personal available incomes of the population, the export, the import, the investments etc. elements which constitute basic factors in the characterization and the analysis of the economical state and of the modifications occurred in it, in a period of time.

We know the fact that the size of the GDP can be determined throughout three methods [2]: the production method (or the added value method), the final production use method (or the expenses method) and the incomes method.

We will analyze in the paper the GDP and its components' dynamics, calculated through the final use method. The Gross Domestic Product determined through this method, represents the sum of the expenses for: the final consumption (FC) calculated as sum between the final consumption of the population (FCP) and the final consumption of the administration (FCA), the gross fixed capital formation (GFCF), the variation of stocks (VS) and the net export (NE) as difference between export (E) and import (I).

In table 1 are presented the values of the GDP and of the elements corresponding to the method of the final use for the 2000–2006 period, expressed in millions of lei (RON) on current prices.

Table no. 1

Indicators	2000	2001	2002	2003	2004	2005	2006
0	1	2	3	4	5	6	7
GDP	80377	116768	151475	197564	246468	288047	342418
FC	69253	99473	127269	169233	210155	252431	300953
-FCP	63459	91718	116940	149259	191050	225978	269807
-FCA	5794	7755	10328	19974	19104	26453	31146
GFCF	15194	24115	32283	42293	53850	66503	84260
VS	454	2229	556	873	4792	-1096	-1312
NE	-4525	-9049	-8633	-14835	-22329	-29791	-41483
-E	26418	38914	53677	68583	88554	94874	110904
-I	30943	47964	62310	83419	110884	124665	152387

Source:Romanian Statistical Yearbook 2006. Monthly Statistical Bulletin No.1/2007.

The evolution of the Gross Domestic Product and of the components on use categories is presented in figure 1, and the weight of each component in GDP total, in table 2.

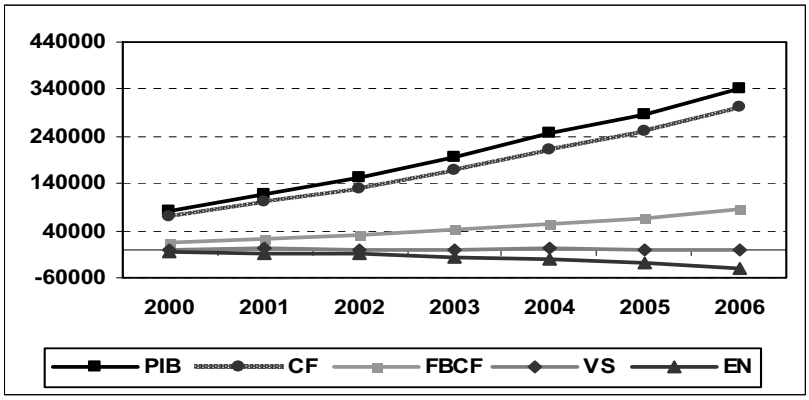

Figure no. 1 The evolution of the GDP - total and per use elements

The summary analysis of the evolution of the GDP, shows that Romania is presently in the seventh consecutive year of positive evolutions, the relatively great annual growth rhythms assuring the gradual reduction of the gaps in report to the European Union.

The most important contribution to the formation of the GDP is held by the final consumption and the gross fixed capital formation, namely the internal demand which represented the main growth factor. From the analysis of the series of data we observe that the weight of the final consumption is in average of 86%, with no very great variations around this figure. On the analyzed period, the difference between the first and the last year is of only 1,73 percents. This indicates a moderation of the final consumption while the gross fixed capital formation had an increasing evolution.

Within the final consumption, the biggest weight is held by the actual individual final consumption of the administrations of the population, appreciatively 90%. However the tendency is of a slight decrease while the final consumption of the public administration registers a continual increase. Thus, if 2000, the population consumption represented 91,63%, at the end of the period the weight was 89,65%, while the consumption of the public administration grew from 8,37% in 2000 to 10,35% in 2006.

Table no. 2

Components	The weight in GDP (%)						
	2000	2001	2002	2003	2004	2005	2006
GDP	100	100	100	100	100	100	100
FC	86,16	85,19	84,02	85,66	85,27	87,64	87,89
-FCP	91,63	92,20	91,88	88,20	90,91	89,52	89,65
-FCA	8,37	7,80	8,12	11,80	9,09	10,48	10,35
GFCF	18,90	20,65	21,31	21,41	21,85	23,08	24,61
VS	0,57	1,91	0,37	0,44	1,94	-0,38	-0,39
NE	-5,63	-7,75	-5,70	-7,51	-9,06	-10,34	-12,11

The gross fixed capital formation presents an increasing trend, the weight in the GDP evolving from 18,90% in 2000 to 24,61% in 2006, this meaning a permanent increase of the investments. In 2006, the sums allocated to the fix capital consumption were of 84260,3 millions lei (RON) increasing by 1,53 percents as compared to the 2005.

The investments registered a constant increase over the last years in Romania and especially over the last period of time as a result of the fiscal relaxation. In 2005, the net inputs of direct foreign investments maintained at a high level, of 6,6% of the GDP. After the reaching of a record value for Romania in 2005, the investments kept on registering high increase rhythms, which led to the substantial increase of their contribution to the real increase of the Gross Domestic Product. Thus, the investment rate calculated as a report between the gross capital formation and the GDP knew an increasing evolution, from 19,46% in 2000 to 24,22% in 2006.

The net export generally had a negative contribution to the GDP increase, as a consequence of some increased goods and services imports caused, first of all by the high dependence of the Romanian economy on the energetic and raw materials imports, and secondly by the imports of capital goods. Every year, the value of the imports exceeded the value of the exports, having closer values between 2000 and 2002 when weights smaller than 5,63%, namely 5,70% of the GDP, have been registered.

The negative contribution of the net export to the GDP increase grew by 1,77 percent in 2006 in report to 2005. This is due to the superior dynamics of the goods and services imports (122,2%) comparatively to the exports' one (116,8%).

In order to determine each components' contribution to the general dynamics of the GDP first it is calculated the general rhythm of the dynamics of the GDP with the relation [8]:

$$R_{1/0}^{GDP} = \frac{\Delta_{1/0}^{GDP}}{GDP_0} \cdot 100 = \frac{GDP_1 - GDP_0}{GDP_0} \cdot 100 \qquad (1)$$

where 1 represents the current period and 0 is the previous period.

The contribution of the composing elements from the method of the final use is determined through the following relations [8]:

- The contribution of the final consumption (FC):

$$A_{1/0}^{CF} = \frac{\Delta_{1/0}^{FC}}{PIB_0} \cdot 100 = \frac{FC_1 - FC_0}{GDP_0} \cdot 100 \quad (2)$$

- The contribution of the gross fixed capital formation ($GFCF$):

$$A_{1/0}^{GFCF} = \frac{\Delta_{1/0}^{GFCF}}{GDP_0} \cdot 100 = \frac{GFCF_1 - GFCF_0}{GDP_0} \cdot 100 \quad (3)$$

- The contribution of the variation of the stocks (VS):

$$A_{1/0}^{VS} = \frac{\Delta_{1/0}^{VS}}{GDP_0} \cdot 100 = \frac{VS_1 - VS_0}{GDP_0} \cdot 100 \quad (4)$$

- The contribution of the net export (EN):

$$A_{1/0}^{NE} = \frac{\Delta_{1/0}^{NE}}{GDP_0} \cdot 100 = \frac{NE_1 - NE_0}{GDP_0} \cdot 100 \quad (5)$$

We observe that:

$$R_{1/0}^{GDP} = A_{1/0}^{FC} + A_{1/0}^{GFCF} + A_{1/0}^{VS} + A_{1/0}^{NE} \quad (6)$$

Thus, for 2006, the rhythm of the dynamics of GDP is the following:

$$R_{2006/2005}^{GDP} = \frac{342418,0 - 288047,8}{288047,8} \cdot 100 = 18,87\%$$

The contribution of the components:

$$A_{2006/2005}^{FC} = \frac{300953,8 - 252431,8}{288047,8} \cdot 100 = 16,85\%$$

$$A_{2006/2005}^{GFCF} = \frac{84260,3 - 66503,8}{288047,8} \cdot 100 = 6,16\%$$

$$A_{2006/2005}^{VS} = \frac{-1312,8 + 1096,3}{288047,8} \cdot 100 = -0,08\%$$

$$A_{2006/2005}^{NE} = \frac{-41483 + 29791,5}{288047,8} \cdot 100 = -4,05\%$$

We observe that relation (6) is verified: 18,87=16,85+6,16-0,08-4,06

By analyzing these results it comes out the fact that a part of the components - namely the final consumption and the gross fixed capital formation - influenced the dynamics of the GDP in an increasing way, and the other two - the variation of the stocks and the net export - in a negative sense.

It also results that the first two had a consistent contribution, a contribution that increased the GDP by 18,87%.

Analogously, we calculate the rhythm of the dynamics and the contribution of the components for the entire analyzed period, the results being presented in table no. 3.

Table no.3

	2000	2001	2002	2003	2004	2005	2006
The dynamics of the GDP (Rhythms with the chain basis -%)							
GDP	47,29	45,28	29,73	30,43	24,75	16,86	18,87
The contribution of the components - %							
FC	38,15	37,60	23,80	27,70	20,71	17,15	16,85
GFCF	10,14	11,10	7,00	6,61	5,85	5,13	6,16
VS	2,46	2,21	-1,43	0,21	1,98	-2,39	-0,08
NE	-3,46	-5,63	0,36	-4,09	-3,79	-3,03	-4,06

During 2000–2006, the first two components of the GDP (FC and GFCF) maintained their supremacy within the contribution at its general dynamics.

The prediction of the Gross Domestic Product during 2007-2010

From the summary analysis of the series of statistical data relatively to GDP from table 1 we can deduce the fact that the tendency is linear. We do not observe that the series would contain also a cyclic and season component, which makes us believe that the results of the analysis point put the usual trend.

All these things suggest the fact that in order to estimate the evolutional tendency of the GDP we can use the linear model. Obviously, all the deviations of the empirical values from the values of the linear model, represent the residual component.

In order to implement this model we used the MINITAB 14.1 program and namely the Trend Analysis component, through which we have obtained a series of results and also the regression coefficient, the determination coefficient, the theoretical and residual values that allow us to analyze the GDP dynamics.

Fitted Trend Equation:
Yt = 28492,4 + 43702,6*t

Time	GDP	Trend	Residual
1	80377	72195	8182,30
2	116769	115898	871,06
3	151475	159600	-8125,19
4	197565	203303	-5738,13
5	246469	247006	-536,77
6	288048	290708	-2660,41
7	342418	334411	8007,14

S = 0,157563 R-Sq = 99,6% R-Sq(adj) = 99,5%

From the analysis of the results, we observe that the empirical trend only contains two components: the linear trend and the residual trend.

We can observe also the fact that the linear trend, in this case, estimates quite well the tendency of the GDP. The average growth from year to year is synthesised by the regression coefficient, which has a quite small value (43702,6) in report to the levels of the dynamic series. The positive value of this coefficient indicates us an increasing tendency of the GDP during the analyzed period.

The determination coefficient (R-Sq) has a quite high value (0,996), which means that 99,6 % from the total variation is explained through the linear model.

Considering the information obtained above we can make a prevision on the evolution of the GDP during 2007–2010.

By using the Trend Analysis function of the MINITAB program we obtain the graphical representation form figure 2 and the following values forecasted for the GDP:

Forecasts

Period	Forecast
8	378114
9	421816
10	465519
11	509221

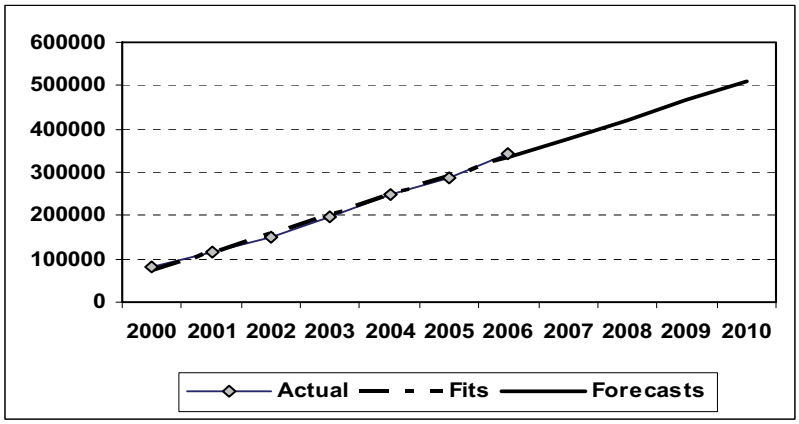

Figure no. 2 The tendency of the GDP during 2007–2010

We proceed similarly for the components of the final use method, the results being presented in table 4, and their weight is illustrated in table 5.

During this period also the most important contribution to the formation of the GDP is held by the internal demand, namely the final consumption and the gross fixed capital formation.

The analysis of the data from table 5 shows us that the weight of the final consumption in the GDP, is about 87,54% the variations around this figure being not very great. Taking 2006 as reference year - being the last year before Romania's adherence to the European Union - we observe that the level of the weight of the final consumption each year of the forecasted period does not the value of 87,89% registered on the adherence date to the European Union. This shows us that in the very next period, the weight of the final consumption in the GDP will not register important increasing, we can actually state that there will be a stagnation process.

Table no. 4

Indicators	2007	2008	2009	2010
GDP	378114	421816	465519	509221
FC	330374	369084	407793	446503
GFFC	100249	118915	139240	161225
VS	993	1586	2375	3355
NE	-53502	-67769	-83889	-101862

In the support of the above affirmations comes the information from table 6 where we show the dynamics of the GDP and of the use components. Thus, the final consumption after a 16,84% increase rhythm to be registered in 2006, as a consequence of the amplification of the population credit, starting with 2007 we observe a significant reduction of the growth rate - to 9,78% in 2007 - as a consequence of the implementation of some limiting measures of the extension of the credit by promoting some real rates of the interests practiced and the maintenance of some cautious wage politics in the public sector. Along the entire analyzed period the average rhythm of the dynamics of the final consumption is 10,37%.

Table no. 5

Components	Weight in GDP (%)			
	2007	2008	2009	2010
GDP	100	100	100	100
FC	87,37	87,50	87,60	87,68
GFCF	26,51	28,19	29,91	31,66
VS	0,27	0,38	0,51	0,66
NE	-14,15	-16,07	-18,02	-20,00

The gross fixed capital formation will register important growth rates - averagely by 17,61% per year - based upon the announced public investments and the private investments internal and external fluxes, as a result of the improvement of perceptions regarding the business environment once our country adhered to the European Union.

Table no. 6

	2007	2008	2009	2010
The dynamics of the GDP (Rhythms with chain basis -%)				
GDP	10,42	11,56	10,36	9,39
The dynamics of the use components of the GDP -%				
FC	9,78	11,72	10,49	9,49
GFCF	18,97	18,61	17,1	15,78
NE	28,97	26,67	23,79	21,42

The weight of the gross fixed capital formation in the GDP, will have an increasing trend during 2007-2010 starting from 26,51% in 2007 and reaching 31,66% in 2010, with an annual average of 29,06%. All these values are above the value of 24,61%, registered in 2006, year where we have registered the greatest value form the 2000-2006 period.

The variation of the stocks, with an average weight in the GDP, of 0,45% will have next a modest influence at the formation of the Gross Domestic Product during the 2007-2010 period.

In the following period also, the net export will negatively influence the increase rhythm of the GDP because the bigger and bigger necessary of equipments and technologies and raw materials and materials, which will make the imports continue to surpass the exports.

Thus, in the next four years the weight of the net export in GDP will evolve from -14,15% in 2007 to -20,00% in 2010, with an annual average of -17,06%.

The rhythm of the GDP and its components dynamics are illustrated in table 7.

According to the above macroeconomical previsions the increase of the nominal Gross Domestic Product will be, averagely, of 10,43% with the possibility to register rate above the average at the middle of the forecasted period. A consequence will be the reduction of the economical and gaps between Romania and the other state members of the European Union.

The analysis of the evolution of the final consumption points out the fact that after a 16, 85% contribution to the dynamics of the registered in 2006, we observe a pronounced decrease, from 8,59% in 2007 and this low level is maintained over the next period, where an average contribution of 9,08% will be registered. All these show us that over the next period the contribution of the final consumption to the dynamics of the GDP will have a decreasing trend.

Table no. 7

	2007	2008	2009	2010
The dynamics of the GDP (Rhythms with chain-basis -%)				
GDP	10,42	11,56	10,36	9,39
The contribution of the components to the dynamics GDP-%				
FC	8,59	10,24	9,18	8,32
GFCF	4,67	5,45	4,81	4,72
VS	0,67	-0,36	0,19	0,21
NE	-3,51	-3,77	-3,82	-3,86

The contribution of the gross fixed capital formation will have per ensemble an increasing trend in the analyzed period with an annual average dynamics of 4,91%, the greatest contribution being registered in 2008. This tendency shows us an increase of the investments which will positively influence Romania's development rhythm.

The variation of the stocks will have a quite small contribution to the dynamics of the GDP and the negative value from 2008 is to be noticed.

The net export will negatively influence the rhythm of the GDP, with an evolution from 3,51% in 2007, to 3,86% in 2010 with an average annual value of 3,77%. However, its contribution every year of the forecasted period does not exceed the 4,06% level registered in 2006, fact which shows us a certain stagnation of the gap between the goods and services import and export during the forecasted period.

Conclusions

The paper presents a picture of Romania's economical evolution, by enlightening the dynamics of the Gross Domestic Product and of its use components, in the context of the existence of two programs - the Convergence Program and the Pre-adherence Economical Program - which had as a the creation of the economical conditions for an adherence to the European Union.

The analyses made showed a positive economical evolution of Romania during 2000-2006, afterwards in the previous years negative rhythms of growth were registered.

The Gross Domestic Product had in the analyzed period an increasing tendency, with an annual average rhythm of 30,45%. The greatest weight to the formation of the GDP was held by the final consumption and the gross fixed capital formation, with annual average values of 85,98%, namely 21,68% of GDP.

The net export negatively contributed to the increase of the GDP, as a consequence of the superior dynamics of the imports and exports. Each year the value of the of the imports exceeded the value of the exports, closer values being in 2000 and 2002 when there were registered weights smaller than 5,63%, namely 5,70% of GDP.

Through the use of the statistical analysis program MINITAB, we made forecasts regarding the evolution of the GDP and of its use components, for the 2007-2010 period.

The results obtained, confirm the tendencies registered during 2000-2006. Thus, the GDP will have next an increasing tendency with an annual average rhythm of 10,43%, and the most important contribution will be held still by the internal demand (formed of the final consumption and the gross fixed capital formation).

The net export will continue to negatively influence the increase of the Gross Domestic Product, still the deficit registered each year of the forecasted period will not exceed the one registered in 2006.

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