I. A NEW VERSION (2018) OF THE ROMANIAN MACROMODEL - AGGREGATE SYSTEM –

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Abstract

The paper presents the 2018 Version of the Romanian macromodel. Among its distinguishing features comparatively with previous variants can be mentioned: a) the econometric procedures are based on statistical series for 1989-2017 years, significantly longer than the previous version (1989-2011); b) there were improved methodological algorithms of approximating some missing data, especially those which concern the tangible fixed assets at constant prices, as a measure of the physical capital of economy; c) in order to ameliorate the operational tractability of the model, the specification of some relationships was revisited, and the modalities of ensuring inter-equation compatibility were also simplified.

This version is structured into three main blocks: (i) the production factors and output; (ii) the domestic absorption and foreign trade; and (iii) the prices and exchange rate, the national budget revenues and expenditures, the public debt. The experimental simulations confirmed the predictive plausibility of this new version.

Keywords: macromodel, accounting and behavioral relationships, simulations
JEL classification: C51, E01, E17

I. Introduction

1. The 2012 operational version of the Romanian annual macromodel, described in Dobrescu (2013a and 2013b), Păuna and Sâman (2013), was created during the 2010-2012 period. Some further adaptations were presented in Dobrescu (2017, pp. 16-19).

Recently, the author finalized the 2018 version, which introduced some notable changes as compared to the previous one.

a) The econometric procedures are based on longer statistical series, from 1989 to 2017, as compared to the previous version (1989-2011). Normally, this increases the relevance of estimators.

b) The methodological algorithms for approximating some missing data were improved, especially those concerning the tangible fixed assets at constant prices, as a measure of the physical capital of the economy.

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c) In order to improve the operational tractability of the model, the specifications of some relationships were revisited, and the means of ensuring inter-equation compatibility were also simplified.

d) The accounting and behavioural relationships were structured into three main blocks:

i) production factors and output;

ii) domestic absorption and foreign trade; and

iii) prices, exchange rate, budget indicators, public debt.

2. A notable role in the macromodel belongs to the aggregate production function (APF).

2.1. Two marginal remarks about APF could be useful.

2.2. The output is most frequently measured by the gross value added at producer prices (GVA). In the real world, however, the goods and services are exchanged at market prices, which expand the basic prices with the effect of indirect taxation. Institutionalized by the central and local authorities, this taxation exerts an active impact on the functioning of the entire economy, which has been often outlined (Ruebling, 1973, Office of the Secretary Department of the Treasury, 1984, Ballard *et al*., 1987, Shrivastava, *et al.,* 2004, Oliveira, 2001, Pudenz, 2010, Hodzic and Celebi, 2017). Therefore, it would be disputable to ignore such a factor in the determination of global output.

In line with a lot of previous opinions, we considered the gross domestic product (GDP) as a more adequate instrument for building the aggregate production function. It synthesizes the activity of all officially registered economic agents. There already exist statistical tools for including an increasing share of the non-registered (informal, non-observed, etc.) sector in the GDP estimates. GDP reflects in a more complex way than the GVA the value creation process by: a) comprising – besides newly created value - the transferred one (capital depreciation); and b) including the newly created value not only at producers' prices, but – through the indirect taxes mechanisms – at market prices, too.

No one considers GDP as a perfect and immutable economic measure, the current debates on this issue being pertinent and, from many viewpoints, promising. We do not exclude the possibility that these debates will be finalized by a substantial reconsideration of conceptual and statistical estimation of the global economic outcome, similarly to the historical jumps represented by the change from the physiocrats' interpretation of productive labour (agriculture and mining) to the classical one (the manufacturing industry is added), or by the more recent enlarged approach (with the inclusion of services). Besides, GDP benefits from an impressive computational experience, its national and international statistical series being, probably after demography, the most reliable macroeconomic data.

2.3. Since the aggregate production function embraces the entire economy, its determinants must be also of the largest explicative extent. It is obvious that the risk to involve an excessive number of explicative variables is high. Regarding this issue, the theory and modelling practice evolved through several stages, starting from the early mono-factor paradigm (with its value based only on labour) to bi-factor (labour and capital) and, subsequently, to more complex specifications. Our paper continues the tradition of a two-factor approach - employment and capital.

3. Some technical problems should be noticed.

3.1. Usually, the time-factor (t) is represented in modelling works by natural numbers. In our application, conventionally, 1989 is the first year making 2017 the 28th.

The temporal asymptotic trends are expressed as in the previous version by $t/(t+c)$ or $(t+c)/t$. For simplicity, as a rule, the assumption that c=1 in the first case and c=1-t in the second is used. Obviously, it is possible to adopt other assumptions for c. The algebraic sign of the attached estimators can be positive or negative. Therefore, a large variety of asymptotical temporal trends can be obtained.

3.2. Several analysed statistical series exhibit the signs of cyclical influences, sometimes with a duration of 8-10 years. For them, the formula $\frac{\sin\left(\frac{2\pi t}{x}\right)}{t}$ (x - cycle length) was adopted. Certainly, it would be excessive to consider such symptoms as a sort of endogenous cycle, of Juglar or other types (as these are described in Korotayev and Tsirel 2010). In our opinion, the revealed cyclicity is rather a data problem, induced by the turbulent processes of transition from the centrally-planned system to the market one. The intensity of such symptoms weakens over time, which is why the cycle formula includes t in the denominator.

3.3. Besides the statistical data and the lags, the macromodel operates with some exogenous series provided by national and international institutions, forecasting agencies and centres, experts (including the author) from the following fields:

a) demography: size of the adult population (AP – number of persons over 15 years);

b) public budget: average level of the legal taxation (atax), the rate of the collected social security contributions (cssc), employment (EG) and mean wage (WG) in the budgetary sector;

c) nominal GDP: expected GDP index in the income method determination (IGDPexp);

d) monetary policy: broad money (M3), monetary policy interest rate (rmon), Central Bank reserves (NBRR);

e) foreign trade: world trade index at constant prices (IWTc), world trade deflator (WTD);

f) balance of payments: net primary and secondary incomes;

g) for the subsequent year: the rate of unemployment (ru), the output elasticity for labor (α), the output-gap (gap), the exchange rate RON/Euro (ERE). Their expected values which were needed in some regressions are the corresponding leads of the statistical series.

3.4. The econometric relationships of the macromodel were grouped into three subsystems, corresponding to the above-mentioned functional blocks. Even under such circumstances, the risk of inter-equation correlations is not negligible. The main possible sources of such occurrence are systematised by Beasley (2008). Consequently, each subsystem of equations was estimated by seemingly unrelated regression (Zellner, 1962).

4. The paper continues with a more detailed examination of the most important data series and the model specification problems. The applicative properties of the entire updated version are illustrated in the third chapter using the simulation results obtained for 2018. Some conclusions and further research suggestions close this first part. It will be followed by another one devoted to the input-output block and the sectoral structure of the Romanian economy.

II. Some Database and Model Specifications Problems

1. The analysis of dynamics and the economic impact of the tangible fixed assets – as the main material support of production – had to surpass serious difficulties from an information point of view.

1.1. The official statistics provides two series of data on this topic.

a) The tangible fixed assets which are described in balance form:

$$KFINb = KIN - OUTK + INK \quad (1)$$

where: KIN and KFIN are volumes of tangible fixed assets at the beginning and the end of the year, linked by the corresponding inputs (INK) and outputs (OUTK).

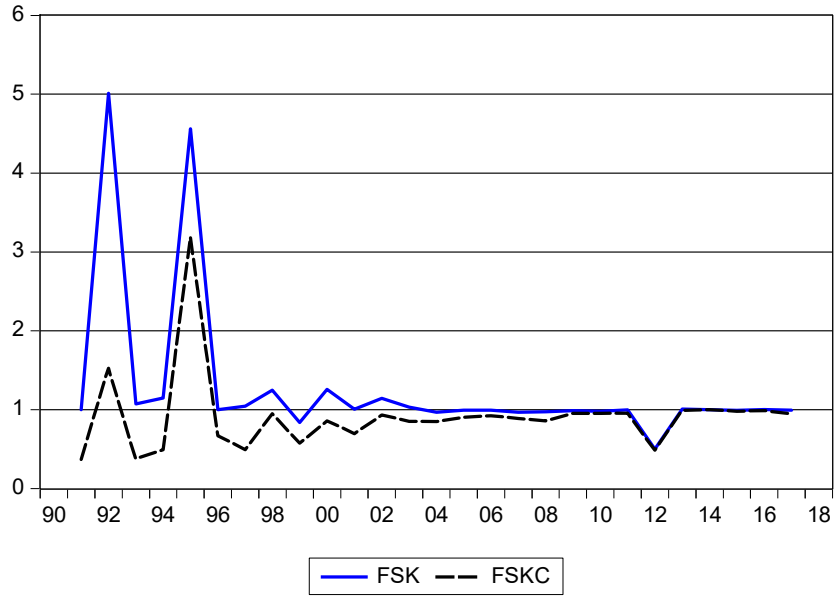
b) There is also data on the gross fixed capital formation (GFCF) and the depreciation rate of tangible fixed assets (dfa). These allow for the recurrent formula:

$$KFINr = KFINr(-1) * (1 - dfa) + GFCF \quad (2)$$

which is largely involved in macroeconomic modelling.

In order to verify the methodological coherence of the data, the ratio of the volume of tangible assets at the beginning of a given year to the volume at the end of the previous one was calculated both in current prices (symbol fsk) and in comparable prices by using deflators for the gross fixed capital formation (symbol fskc). In principle, both these relative measures should oscillate around unit (within a statistically acceptable band).

Figure fsk



Therefore, fsk and fskc evolve around unit in many years, but the opposite situations are also present. Moreover, the deviations are abnormally high. Such perturbations may come from some real processes, but they can signal that the respective series are not homogenized from the methodological point of view.

Some possible causes of such discrepancies are:

- the changes in the accounting definition of the tangible fixed assets;
- the technical progress and other circumstances, which lead to extended re-evaluations of the existent tangible fixed assets in both possible directions (deduction or increase in value);
- the restructuring processes and business cycles shocks, when a great part of operators exit from the market and new ones enter the game.

Not accidentally the first years of transition were characterized by especially large deviations, as in Figure fsk. In that period, many radical institutional reforms (associated with the introduction of the complete national accounting system) were promoted and the economy underwent a deep, sometimes chaotic, sectoral restructuring. The instability of the fsk and fskc ratios continued during the following years, but in a clearly diminishing proportion, with the exception of the last global financial crisis.

1.2. When building the macroeconomic production function, therefore, it would be too risky to use the balance data as such. To use only the indicators for the recurrent formula is also not possible in the absence of a credible statistical starting capital stock.

Both these informational sources are valuable. The global dynamics of the tangible fixed assets volume is better reflected by the balance data. Instead, the information for recurrent formula are more reliable because they come from standardized accounting documents of the economic agents and, besides, must conform to other macroeconomic aggregates.

Therefore, a mixed solution was adopted. As a preliminary step, the data were translated into constant prices (2005 as referential year). The name of the series in constant prices was obtained by adding the suffix 05 to their acronym. The following system was then solved:

$$KFIN05 = [KFIN05(-1) * (1 - dfa) + GFCF] * \varphi \quad (3)$$

$$\sum (KFIN05 - KFIN05B)^2 = min$$

In other words, the estimates based on the recurrent formula are amended by the coefficient φ, which results from the condition of minimizing the sum of squared differences against the balance data. This coefficient can be fixed for the entire computed series or variable. Both algorithms were performed.

According to the first (fixed coefficient) the system has converged for φ=0.998186 (Model1). The second algorithm was applied with three φ coefficients for the following sub-intervals:

- φ1=0.774 for 1990-1996, which represent the initial phase of reforms towards the market mechanisms (change in the institutional architecture, the liberalization of economic life, the privatization of a large part of the state enterprises, etc), marked by an accentuated devaluation and even direct disposal of many tangible fixed assets:
- φ2=1.1407 for 1997-2002, when the sectoral reorganization of the economy has been accelerated and the process of acceding to the European Union has begun; the

accounting notion was extended, the market value of many tangible fixed assets increased;

- φ3=1.006247 for 2007-2017, during which Romania evolved as a full-member of the European Union; the balance data and those based on recurrent formula begun to converge. (Model2).

Figure K

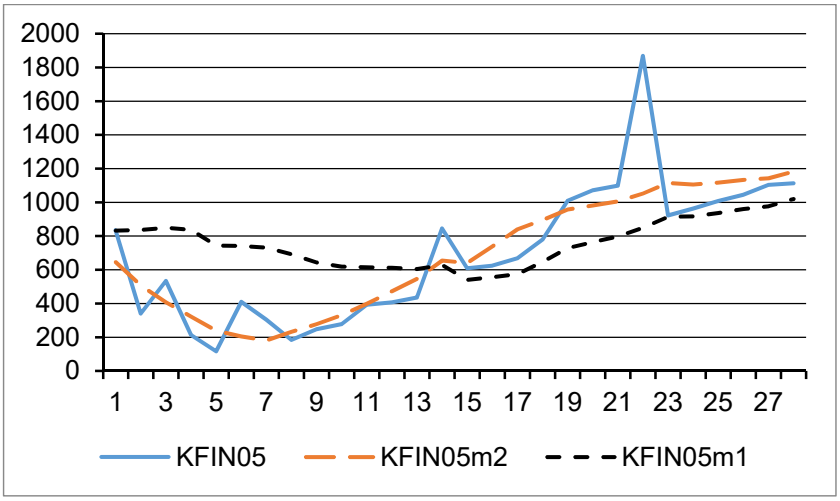


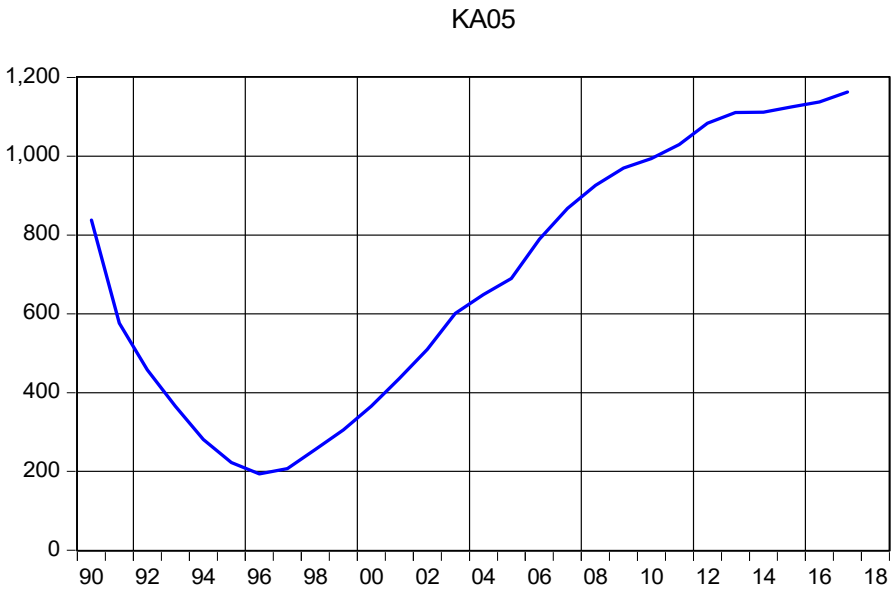
Figure K displays both estimated series with fixed (m1) and variable coefficient (m2) comparatively to the original data. The curve KFIN05m1 departs significantly from the balance data. KFIN05m2 approximates them much better, which is not a surprise. The evolution of the fsk parameter – significant fluctuations in the first part of interval followed by a stabilization tendency in the second one – showed already that the algorithm with a fixed φ would not be realistic. Consequently, the results generated by the Model2 have been retained.

As compared to the previous version of the Romanian macromodel, the new adopted computational algorithm has the advantage that it generate estimates which exploit information from all the available sources.

1.3. It is well known that the tangible fixed assets are a stock-indicator. The macromodel operates, however, with many other flow-indicators, beginning with GDP itself. Consequently, not to use data for the beginning or the end of the year was considered as more suitable, but rather to use the average level, defined as follows (in constant prices 2005):

$$Ka05 = (KFIN95m2 + KFIN05m2(-1))/2 \quad (4)$$

The resulted series are presented in Figure Ka05.



Overall, the graph approximates correctly the global dynamics of the economic reality, characterized by an initial drastic crash in the volume of tangible fixed assets, after which these have registered an ascending trend, so that their pre-1990 level was surpassed in 2007.

1.4. As a production factor, the capital is important not only as a volume, but also as a technological structure. This is why the renewal degree of capital (rdk) was introduced, defined as:

$$rdk = GFCF05/Ka05 \tag{5}$$

which measures the intensity of their modernization.

2. The Romanian economy was characterized by a significant compression in employment, due to a multitude of causes: a) the general demographic descending trend, which reduced the size of the available labour force; b) the restructuring reforms of transition, with an extended de-industrialization of the country; c) the emigration of a great part of labour force.

Coming back to the APF determination, the labour factor could be approximated by the number of employed persons (E) or the number of working hours (HW). Taking into account the longer experience of the statistical institution in calculating the employment as a number of persons, we opted to use this series in the modelling of the Romanian economy.

3. Remaining in the Cobb-Douglas framework (constant return to scale), an open question is how to establish the elasticities of the output relative to capital (Ka05) and labour (E). During the examined period, the Galtung-Pearson correlation of real gross domestic product (GDP05) is high with both factors, but negative for labour (- 0.85) and positive for capital (0.91). Under such conditions, a direct, unrestricted regression of a usual bi-factor APF would inherently generate economically implausible factor elasticities. Similar to many other studies, the present version of the Romanian macromodel adopts – only as a

pragmatic solution - the neo-classical assumption of equivalence between the output elasticities and their corresponding factor share in the GVA. Therefore, if the output elasticity relative to employment is α (1>α>0), then the output elasticity relative to capital is automatically (1-α). Beginning with the famous "Cambridge versus Cambridge" debate, such a theorem has never stopped to be controversial, even today. Since this question needs a more comprehensive discussion, we hope to come back to it in a future paper.

4. The output-gap is approximated by computing the aggregate production function in a double configuration. The first evaluates the output according to current (relatively volatile) functional characteristics of the economy, while the second tends to bring such an estimation as close as possible to the steady state conditions presumably.

4.1. In other words, based on the formula:

$$Output = [(AP * prap * (1 - ru))^{\alpha} Ka05^{1-\alpha} tfp05] \quad (6)$$

Two output levels are calculated - GDP05 and GDPP05 – as numerical expressions of the mentioned interpretations. More concretely, the size of population over 15 years (AP – as exogenous) and the physical capital (Ka05 – endogenously defined) are common for both GDP05 and GDPP05. Instead, the other explicative variables are differentiated.

a) In the case of GDP05, the participation rate (prap), the unemployment rate (ru), the output elasticity for employment (α) and the total factor productivity (tfp05) result from econometric relationships based on the statistical series.

b) For GDPP05, the same determinants are approximated econometrically, with the help of a HP filter. Almost no one contests the theoretical weaknesses of such an approach. Numerous empirical searches call however to it, which is explained by its practical advantages (simplicity and robustness, as compared to other computational schemes).

4.2. Through the GDP05/GDPP05 ratio, the macromodel estimates the so-named output-gap, which intervenes in the right hand side of the equations for the foreign trade and prices.

5. The main components of domestic absorption, the household consumption, the public consumption, and the gross capital formation, are estimated by distinct econometric equations. Only the inventory change is deduced as a residual value from the accounting definition of the GDP utilization.

6. The foreign trade consists of equations for the total export (XGSE) and total import (MGSE), in Euro. Their separation into usual sub-components - goods and services – is obtained with additional relationships. A similar procedure is applied for the transformation of the values expressed in Euro into national currency. In this way, the foreign trade indicators can be integrated into the global macroeconomic interdependencies.

7. The nominal segment of the macromodel is centred on GDP at current prices and GDP.

7.1. The expected index of GDP at current prices plays the role of a model-anchor for the nominal indicators. Not accidently, almost all of the operational versions of the macromodel called to this anchor. GDP at current prices is linked to its determination as the sum of the revenues obtained by the participants in the economic activity – employees, firms, Government. All these economic actors have a consistent socio-political representativeness (trade-unions, entrepreneurs' unions, parties, civic organizations, local and central institutions, etc).Their strong motivation for reaching the programmed revenues is understandable, the probability of self-fulfilling expectations being therefore significant. Notice, in this context, that the prognosis on nominal GDP has a better accuracy,

comparatively with other macro-indicators. Maybe it is not an accident that there were already advanced proposals for monetary policy to target the nominal GDP (Scott and Roberts, 2018).

7.2. The GDP deflator (PGDP) is approximated as the ratio of the expected index of GDP at current prices to the model estimates of the real output dynamics ($GDP05/GDP05(-1)$).

8. The previous version of the macromodel defined the main price indices – the consumer price index and the investment price index – through autonomous econometric relationships, amended by latent variables ensuring compatibility with the GDP deflator. The solving algorithm was complicated by this addition.

The present version attempts to simplify somehow this problem, maintaining however the connection with PGDP, which is vital for the coherence of the entire system. In the Romanian economy, for example, the ratio of the sum of household consumption to the accumulation oscillated between 85 and 95% of the GDP. The Granger causality test is also relevant (Table 1).

Table1

Pairwise Granger Causality Tests

Sample: 1990 2018; Lags: 3			
Null Hypothesis:	Obs	F-Statistic	Prob.
PGDP does not Granger Cause CPI	25	3.87401	0.0267
CPI does not Granger Cause PGDP		3.56843	0.0348
PK does not Granger Cause CPI	25	5.94598	0.0053
CPI does not Granger Cause PK		2.50799	0.0916
PK does not Granger Cause PGDP	25	6.13161	0.0046
PGDP does not Granger Cause PK		3.58124	0.0344

The new version of the macromodel introduces an explicit link between the partial prices CPI-PK and PGDP:

$$PGDP = c(201) * CPI + c(202) * PK \quad (7)$$

and a relationship defining the disparity between these indices, as a ratio ($CKPr = CPI/PK$):

$$CKPr = c(203) + c(204) * GAP(-1) + c(205) * rmon + c(206) * rIERE\ (-1) \quad (8)$$

where: GAP represents the output-gap, rmon – the monetary policy rate, and rIERE – the relative modification in the exchange rate. Based on the estimators c(201) and c(202) from the model relationship of the PGDP (equation 7), CPI and PK are deduced as following:

$$CPI = \frac{PGDP}{c(201)} + \frac{c(202)}{CKPr} \quad (9)$$

$$PK = \frac{CPI}{CKPr} \quad (10)$$

This solution proved to be more robust than the previous one.

9. The exchange rate estimate combines the inertial factor (ERE(-1) with the stabilising effect of the Central Bank reserves and of expected exchange rate for the subsequent interval.

10. The General consolidated budget was included in a maximally aggregated form: the global taxation and public expenditures. The LINS (Laffer in narrower sense) curve is

incorporated now (as in Dobrescu, 2018). The public debt and total external debt are computed by accounting relationships.

11. The macroeconomic module of 2018 version can be numerically summarized as follows:

Table 2

Version 2018 of the Romanian Macromodel (Aggregate System)

Functional block	Econometric relationships	Accounting relationships	Total
Production factors and output	10	14	24
Domestic absorption and foreign trade	9	11	20
Prices, exchange rate, budget indicators, public debt.	8	23	31
Total	27	48	75

The aggregate system is coupled with an extended input-output block, which will be described in the second part of paper.

III. Experimental Simulations for 2018

The new version of the macromodel was used for experimental simulations concerning the Romanian economy in 2018. The values for the exogenous variables took into account the officially reported results for the first quarters of this year and, also, the main dominants of public finance and monetary policies promoted by the authorities. Estimations are presented in Table 3 in comparison with forecasts produced by the European Commission (European Commission, 2018), International Monetary Fund (Daily News Business, 2018), and Romanian National Commission for Strategy and Prognosis (NCSP, 2018).

1. Regarding the economic growth, the macromodel simulations exceed the EU anticipations, but are lower than those of the NCSP, being located within the IMF prediction interval. The registered deceleration of economic growth was accompanied by a recrudescence of inflationary pressures, which reveals a visible weakening positive effect of the initial fiscal measures adopted by the Government.

The real consumption index (private and public) has continued to surpass (it is true, at a lower rate) the rate of growth of GDP at constant prices, but under circumstances of a reinvigoration in the gross capital formation.

2. Concerning the foreign trade of goods, the model simulations indicate for 2018 a deficit comparable with previous year data (around 12 bill. Euro). This negative balance was attenuated by the surplus obtained in services trade, especially in the sector of tourism.

The deficit in the goods trade does not differ significantly from the NCSP prediction, but the corresponding volumes of export and import differ. The possible sources of this discrepancy will be further analyzed from informational and econometric viewpoints.

3. In the model simulations, some parameters of global financial framework do not look bad: a public budget deficit below the targeted threshold of 3%, and a ratio of public debt to GDP (41.4 %) far enough from the Maastricht ceiling of 60%. The external debt of the country (total 97.3 bill. Euro) represents already almost half of the gross domestic product.

4. The NCSP forecast for the GDP deflator and consumer price index are higher than the macromodel estimations, mainly because of the differences in the nominal GDP.

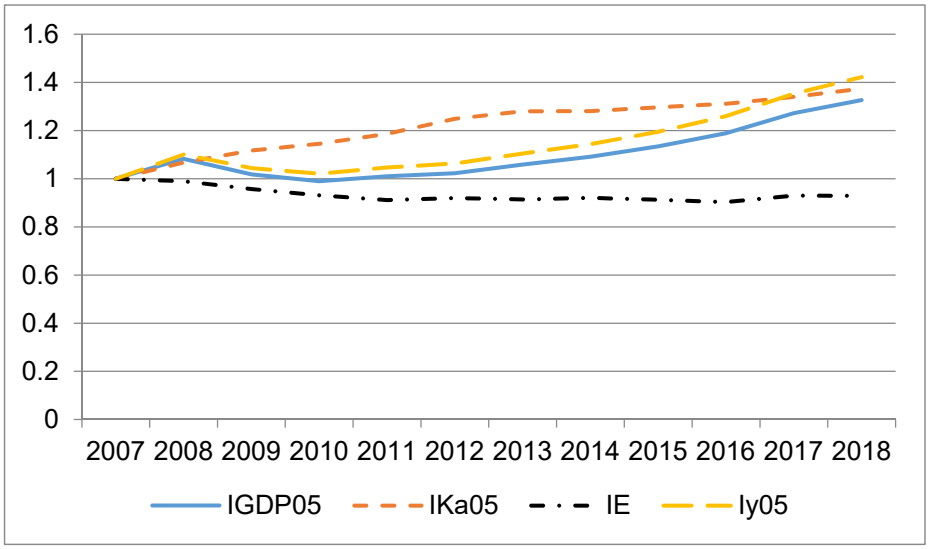
The Main Indicators of the Romanian Economy, 2014-2018

Indicator	Symbol	Source	2014	2015	2016	2017	2018
Gross domestic product, current prices, bill. RON	GDP	NCSP			762.3	858.7	949.6
		Model	668.1436	712.6585	762.342	856.3518	929.1417
Index of gross domestic product, constant prices	IGDPc	EU				1.073	1.036
		IMF					1.04-1.045
		NCSP			1.048	1.069	1.045
		Model	1.030722	1.039697	1.04823	1.069928	1.0424369
Index of total consumption, constant prices	ICONSc	Model	1.044433	1.068766	1.10783	1.112941	1.0490351
Index of gross fixed capital formation, constant prices	IGFCFc	NCSP			0.98	1.047	1.035
		Model	1.031616	1.073742	0.98005	1.053804	1.0956755
Export of goods, bill. Euro	XGE	NCSP			57.3922	62.644	68.29
		Model	46.814	49.113	52.17	57.1	63.392089
Import of goods, bill. Euro	MGE	NCSP			67.3644	75.603	82.93
		Model	53.351	56.901	61.423	69.128	75.359913
Consumer price index	CPI	EU				1.011	1.043
		NCSP			0.9845	1.013	1.047
		Model	1.0107	0.9941	0.9845	1.0134	1.0393146
GDP deflator	PGDP	NCSP			1.021	1.046	1.059
		Model	1.0169	1.0259	1.0205	1.0499	1.0408304
Exchange rate, RON/Euro	ERE	NCSP			4.4908	4.5681	4.65
		Model	4.4446	4.445	4.4908	4.5681	4.6763836
Employment, mill. persons	E	NCSP			8.4488	8.67	8.7
		Model	8.6137	8.5354	8.44878	8.697	8.6957028
Unemployment rate	ru	EU				0.049	0.043
		NCSP			0.048	0.04	0.035
		Model	0.068	0.068	0.059	0.049	0.0497067
Rate of the public budget balance	cbb	EU				-0.029	-0.033
		Model	-0.0172	-0.013514	-0.02401	-0.02833	-0.028837
Ratio of public debt to GDPe	pdg	Model	0.44227	0.443317	0.44537	0.41833	0.414394
External debt, bill. Euro	TEXDE	Model	94.7443	92.0685	92.9098	93.9539	97.316165

Note: NCSP-Autumn Prognosis 2018 of the National Commission for Strategy and Prognosis.

The model presumes an increase in the exchange rate by 2.37%, less than the GDP deflator (over 4%). The resulted evolution of the comparative price level - important facet of the convergence process - reflects both the transformations produced in the economy and the adequacy of NBR policy in this field. The Graph G displays a global image of the Romanian post-crisis dynamics. The gross domestic product (IGDP05), the volume of tangible fixed assets (IKa05), the GDP per capita, and the employment (IE) are presented as 2007 indices.

Graph G. Post-crisis Dynamics of the Romanian Economy



5. The country will face, however, future complex problems. Several of them will be briefly commented.

5.1. The first - strikingly evident – is represented by the infrastructural deficit in the broadest sense: energy, water, education and health systems, practically all components of the transport network, telecommunications, urban modernization of localities.

The considerable economic efficiency and general civilising impact of the infrastructure (in the mentioned largest acceptance) has been frequently outlined in literature, from which we cite only recent titles (Prud'homm, 2004, Estache and Atsuhi, 2008, Douglas *et al*., 2009, Égert *et al*., 2009, Normaz and Jamilah Mahyideen, 2015). Some countries have adopted even national programs for infrastructure development (Australian Government, 2006, Brodhead *et al*., 2014, Government UK, 2016). A special attention was paid to the necessary financing sources, including possible major contribution of the private-public partnership in this field (Panayiotou and Medda, 2014, Schwartz, 2015, Price, 2016, Ruiz-Nuñez *et al*., 2016, Verougstraete, 2017).

5.1. Coming back to Romania, together with the imperative necessity to continue the sectoral restructuration of the economy (through a rational correlation between tertiarisation and basic branches, and by expansion of technologically leading industries), the infrastructure development needs an intensive accumulation effort.

Public sources can play yet an important role, but not through taxation (LINS curve shows clearly this restriction), but by a better collection of taxes, and a more efficient utilization of the budget revenues. The stimulation of private saving and investment, and of the great private-public projects, is probably of a decisive importance, as well as the better absorption of the EU non-reimbursable structural funds and the amplification of the foreign capital inflows. The question is, obviously, extremely complex, the present paper only notes it.

5,2. The Romanian economy is more and more affected by an aggravating labour force deficit, both structural and overall. The deceleration of economic growth (signalled by the macromodel simulations and other authorized forecasts) simultaneously with the relatively low unemployment rate and increasing wage pressure reveal un-ambiguously this dis-equilibrium. Of course, the programs stimulating and facilitating the repatriation of the Romanian emigrants are welcome. The time for a deepened discussion about immigration in general has come also.

5.3. This brief list cannot however omit the institutional problems. At all levels of the social life, the decisions in this field have to carefully analyze the trade-off between the pluses of changes obtainable maybe in the long run, and their negative implications, certain and sometimes considerable in the short and medium one. The stabilization of the legislative and, in general, the institutional framework of the economy, became an essential condition of continuing the, so vital for Romania, intense economic growth.

IV. Some Final Remarks

1. The above-discussed new version of the Romanian macromodel proved to have some useful advantages as compared to its previous versions.

The robustness of estimations has increased, without losing its operational flexibility, which is the capacity to accommodate to volatile domestic and international framework in which the real economy is functioning. Simulations on 2018 year confirmed also the plausibility of provided estimations.

Undoubtedly, this version – as any other similar forecasting work – must be seen exclusively as an auxiliary computational tool. Consistency of the adopted premises for different scenarios remains decisive in forecasting building.

2. In this respect, there are two categories of problems.

a) For some macromodel exogenous variables, there are predictions on time-interval of interest emitted by other institutions (international organizations, Government, Central Bank, trade-unions and employer-associations, specialized scientific and consulting centres). Important in such situations is, obviously, to call the most credible sources (selected in dependence to the accuracy of their previous estimations).

b) On the other hand, further intensive research would be necessary for prospective evaluation of the nominal GDP and of the lasting effect of preceding shocks.

3. The macroeconomic module (presented in this paper) will be completed by an input-output one, which increases the sectoral structure from 10 (version 2012) to 14 sectors (Dobrescu and Gaftea, 2017), namely: (i) Agriculture, forestry, hunting and fishing; (ii) Mining and quarrying; (iii) Production and distribution of electric and thermal power; (iv) Food, beverages and tobacco; (v) Textiles, leather, pulp and paper, furniture; (vi) Machinery and equipment, transport means, other metal products; (vii) Other manufacturing industries; (viii) Constructions; (ix) Transports, post and telecommunications; (x) Trading services; (xi) Financial services and real estate transactions; (xii) Social services; (xiii) Creative services; and (xiv) Professional services (mainly businesses).

Matrices of 14*14 dimension allow a more detailed analysis of the direct and propagated effects induced by the structural changes of the Romanian economy.

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