MACROMODEL ESTIMATES OF THE NATIONAL ECONOMY OF THE REPUBLIC OF MOLDOVA FOR THE PERIOD 2015-2018

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Abstract

The estimates of the macroeconomic indicators for the period 2015-2018 are carried out under an econometric model, which has exogenous variables: internal and external indicators. This allows developing a forecast, which takes into account the economic influence of the main partners of the Republic of Moldova and the decisions leading to the evolution of such internal indicators as the monetary aggregate M2, exchange rate, and interest rate on credits.

Keywords: macroeconometric model, forecast, macroeconomic indicators.

JEL classification: C5, E2

1. Introduction

The scenario of economic development of the Republic of Moldova (RM) is elaborated on the basis of an econometric model (Toaca, 2011) which consists of four blocks of interdependent variables:

- Real sector;

- External sector;

- Wage-unemployment;

-       Block of prices.

The macroeconomic model used for the forecast has been updated and the regressions have been estimated using the statistical information of RM from the years 1994 - 2014. The general recommendation is to update the model every two years, but, taking into account the small number of observations used to elaborate the model it is necessary to make this every year. The general structure of the macroeconomic model used in the exercise of forecasting of macroeconomic indicators hasn't undergone major changes after estimated regressions.

Update regressions are carried out by ordinary LS (Least Squares) and LS in two stages in compliance with the case. The significance of factors was determined by *Student test* and the significance of regression - by adjusted R^2 and *Fisher test*. For detecting the presumption of the autocorrelation of errors there has been used *Durbin-Watson test* (when the regression does not contain variables with time delay) and *Breusch-Godfrey* (in the presence of lag variables). If the applied tests detect the presence of autocorrelation, the well-known *Cocrane-Orcutt procedure* is applied. The heteroscedasticity of errors is detected by the tests: *White, Breusch-Pagan-Godfrey, Harvey, Glejser* and there are undertaken corresponding procedures to combat them. Hence, the regression of the model lacks heteroscedasticity and autocorrelation errors.

The econometric model used in 2015 to forecast the main macroeconomic indicators contains 52 endogenous variables and 24 exogenous variables, 12 binary variables (Dummy).

2. Premises of the economic growth of the Republic of Moldova

In the last five years the economy has advanced with relatively stable rates – the average annual GDP (Gross Domestic Product) has increased by 5,4%, but at the end of 2014 the situation has changed significantly and continued to change in the first months of this year. The premises are that Moldova has entered in a phase of uncertainty of political and economic instability caused both from within and outside the country. In such conditions it is unlikely to expect a clear and stable development of the national economy in 2015.

In 2015 the key risks can be:

−   **The reduction of remittances from migrant workers** (in the I[st] quarter it has already decreased by 74,4 mil. USD or 23,7% compared

to I quarter 2014) **and the devaluation of the national currency**. Given these risks, the possible scenario in 2015 may be a slight increase in the economy, even recession. High dependence of the economy on external factors, in particular the situation in Russia and Ukraine, and the deficit of functional state institutions worsen the internal situation and reduce the likelihood of taking measures to mitigate negative consequences. The devaluation of the national currency will lead to price increases, and inflation, in its turn, will reduce the purchasing power of consumers, a factor which will not stimulate the growth of production, exports and imports.

− **Delaying reforms, particularly in the judiciary system**. These reforms would help to improve the investment climate and conditions for business promotion which could influence positively the conditions and results of economic activity and contribute to the raising of living standards.

− **The negative consequences of the events in Ukraine**. The military actions in the neighboring country will have serious consequences on Moldovan economy because foreign investors perceive Moldova as a dangerous area because of the possible Russian military expansion. In addition, the country entered 2015 without approving the Budget Law. Creating a parliamentary majority from minority will keep the country in suspense with a permanent risk of early elections.

− **The considerable worsening of the situation in the position of financial and foreign exchange market**. The deregulation of the financial and foreign exchange market has led to serious consequences in the banking system. As a result, three large commercial banks - the Banca de Economii, Banca Sociala and Unibank were about to go bankrupt. To save them, the National Bank of RM introduced special caution by giving a large financial aid, which could, then, be converted into the internal debt of the Government with all the negative consequences on the budget system.

Beyond the inevitable risks that Moldova will face, there also persist premises to overcome many of them depending on the consistency and political will of the current government to achieve strict implementation of the Association Agreement with the EU.

The EU has responded positively to the request of Moldova on the extension of High-Level Expert Group which will facilitate the process of internal reform and the implementation of the Association Agreement. However, there has been mentioned the commitment to use the opportunities offered by the free trade area, inclusively by increasing direct European investments in the national economy, especially in the rural areas.

3. Evolution of exogenous factors

The forecast obtained in the model depends on the values of exogenous factors both internal and external. The external influence on the national economy is characterized by such global variables as the evolution of GDP (Gross Domestic Product) worldwide, CPI (Consumer Price Index), and the evolution of the world price for oil products and gas. Remittances can be considered as an external factor too. Internal exogenous factors are: the interest rate on credits, the monetary aggregate M2, the average exchange rate of the dollar, and public budget expenditures.

The macroeconomic model is used to forecast macroeconomic indicators for medium-term. The dynamic of the evolution of the country's main macroeconomic indicators is determined by specifying regressions and exogenous factors (Table 1). A part of exogenous factors are forecasted by the relevant institutions in the field: global indicators – by the International Monetary Fund, public expenditures – by the Ministry of Finances, the exchange rate of the dollar – by the National Bank of Moldova. Other factors are forecasted on the basis of quarterly series, besides the basic model: remittances, money supply. Certainly, experts are also involved in the forecast of these factors. The events taking place at the end of the last year have essentially changed the evolution of exogenous factors. This has led to the increase of interest rates on loans that in 2015 will be 14 %, which is different from the estimates of the previous year (around 10%). There has been a change in the estimates of the evolution of money supply and the average annual growth will be 5%. In 2013 there was an unexpected evolution of remittances (1609 mln. USD) and this level was maintained in 2014, too. The highest level was recorded in 2008 - 1660 mln. USD. The instability in Russian economy and other events such as the expulsion of our citizens from Russia, and the family reunification will reduce the amount of money transferred from abroad (Table 1). A significant jump occurred in the

devaluation of the lei against the dollar so the dollar exchange rate will exceed the level of 18 lei / USD in the following years.

The evolution of global indicators estimated by the IMF in April 2015 (exogenous factors):

- The Consumer Price Index has an average growth rate of 3,4%;

- The price for gas will record a 10,2% decrease in 2015;

- The IMF forecasts a negative evolution for the prices of petroleum products;

- The agricultural food products price index will fall by 15,2% in 2015;

- The growth rate of global GDP changes from 3,6% to 3,9%.

Table 1: Values of the exogenous indicators for the years 2012-2018

		2012	2013	2014	2015	2016	2017	2018
Interests rate on credits in RM	%	13,34	12,26	10,6	14	13,5	13	12,5
Interest rate index on credits	2000=100	40,07	36,83	31,8	42,1	40,6	39,1	37,5
The monetary aggregate M2, end of year	mill. lei	34915	45117	43220	45381	47650	50032	52534
annual increase	%	123,5	129,2	95,8	105	105	105	105
Budgetary expenditure	mil. lei	35373	38651	43242	44877	49961	52841	55887
The population RM	thousands	3560	3560	3557,6	3555,2	3553,6	3552,1	3550,6
Remittances	mill. USD	1494	1609	1613	1500	1480	1450	1400
annual increase	%	103,5	107,7	100,03	93	98,7	98	96,4
World Consumer	2000=100	165,4	171,9	177,8	183,5	189,6	196,2	203,1

Price Index								
annual increase	%	104,2	103,9	103,5	103,2	103,3	103,5	103,5
World GDP	mill. USD, price 2000	52157	53934	55762	57687	59855	62158	64566
annual increase	%	103,4	103,4	103,4	103,6	103,8	103,9	103,9
World Food Price Index	2000=100	214,2	214,1	209,5	177,6	173,5	173,1	172,2
annual increase	%	95,9	99,9	97,9	84,8	97,7	99,8	99,5
World Gas Price Index	2000=100	285	274,5	256,7	230,6	225,7	225,7	225,7
annual increase	%	111	96,3	93,5	89,8	97,9	100,0	100,0
World price of mineral products index	2000=100	371,9	368,6	340,9	205,9	232,5	247	254,2
annual increase	%	99,1	92,5	92,5	60,4	112,9	106,2	102,9
The exchange rate of national currency	lei/USD	12,1	12,6	14	18	18,5	18,7	19

Source: elaborated by the authors

4. The forecast of macroeconomic indicators

Analyzing the current situation, considering the forecasts of international institutions of the global economy and in particular of the Republic of Moldova, taking into account the views of national experts, based on the macroeconomic model of the simulation of the economic growth there were performed calculations for forecasting the main macroeconomic indicators for 2015-2018 years. (Table 2)

It is worth mentioning, that the growth rate of the forecasted indicators for the period 2015-2018 might seem, at the first glance, too optimistic, but a

more thorough analysis of the development in the previous years shows the following:

–   the GDP of the RM in the period 2015-2018 will have an average growth rate of 5% (0,6% in 2015; 6,8% in 2016; 6,6% in 2017 and 6,5% in 2018). Comparing the evolution of this indicator with that of the past, we see that the expected rhythms are fully consistent with those already obtained. Thus, the average growth rate in the last 5 years (2010-2014) was 5,4% and in the years up to the 2009 crisis (2004-2008) was 6,1%. As we observe, there continues a tendency of gradual attenuation of the growth rate in time. A similar trend is observed in the evolution of other indicators.

–   during the forecast period the industrial production will have an average growth rate equal to 5,8% compared with 6,1% in the previous period, agricultural production – 4,2% and 5,6%, exports - 8,0% and 12,8%, imports – 6,3% and 10,2%. Another situation is observed in the investment in long-term tangible assets, where the growth average rates during the forecast period (7%) will overtake the previous period (6,2%).   Since the internal and external situations improve and the investment climate in the RM grows, the average rates will rise in comparison to those achieved in the previous period.

Table 2: The dynamic evolution of the main macroeconomic indicators for 2012-2014 and the forecasts for the years 2015-2018

	Unit of mesure-ment	2012	2013	2014	2015	2016	2017	2018
		Actual			Estim.	Forecast		
Nominal GDP	bln. lei	88,2	100,5	111,5	119	134,8	151,7	170,4
Compared to last year in comparable prices	%	99,3	109,4	104,6	100,6	106,8	106,6	106,5
Average annual consumer price index	%	104,6	104,6	105,1	107,8	106,4	105,8	105,5
Export of goods	mln. USD	2162	2428	2340	2387	2649	2923	3200
Compared to last year	%	97,5	112,3	96,3	102,0	111	110,3	109,4
Import of goods	mln. USD	5213	5492	5317	5341	5821	6285	6786
Compared to last year	%	100,4	105,4	96,8	100,4	109	108	108
Trade balance	mln. USD	-3051	-3064	-2977	-2953	-3171	-3362	-3587
Industrial production in curent prices	bln. lei	36,0	39	42,2	44,2	48,7	53,3	57,9
Compared to last year in comparable prices	%	98,1	106,8	107,2	102,8	107,1	106,7	106,7
Agriculture production in curent prices	bln. lei	19,9	23,8	27,1	28,6	31,9	35,1	38,5
Compared to last year in comparable prices	%	77,6	139,1	108,2	100,2	106	105,5	105,2
Investment in-long term tangible assets	bln. lei	17,1	18,6	20,4	21,7	25	28,1	31,6
Compared to last year in comparable prices	%	98,9	101,5	101,8	101,2	109,7	107,9	107,7
Average nominal monthly salary	lei	3478	3765	4172	4521	4980	5441	5930
Compared to last year								
nominal	%	108,9	108,3	110,8	108,4	110,2	109,3	109
real	%	104,1	103,5	105,4	100,5	103,5	103,3	103,3
Labour remuneration found	bln. lei	39,7	42,9	45,2	49,6	56,3	63,2	70,7
Labour force (economically active population)	thousands pers.	1214,5	1236	1153,4	1130	1107,7	1086	1063,8
Number of employees in national economy	thousands pers.	1146,8	1172,8	1113,1	1084	1066	1049	1030
Unemployment rate	%	5,6	5,1	3,6	4,3	3,8	3,5	3,2

Source: elaborated by the authors

Since the manufacturing industry occupies a big share of the industry, the fluctuations in the growth of this sector are influenced by agriculture. The Real GDP is calculated by the method of resources in the model and for its constitution there have been highlighted the main branches. So, the growth

rate of GDP for the years of forecasting is determined by the growth of these branches (Table 3).

For the years 2015-2018 the share in creating the value added in the national economy doesn't suffer major changes compared to 2014: the share of the agricultural sector is 21%, industry - 16%, with a slight increase of 17% and services – around 56%. However, there is a significant difference compared to, for example, the year 2000, when agriculture constituted 29%, industry - 18% and services - 53%

Table 3: Growth of the value added of the main branches of the national economy

	Agriculture	Industry	Trade	Transport	Other services	Net taxes on products
2012	88,6	101,6	104,4	104,0	103,1	101,8
2013	145,3	106,6	106,3	102,3	101,8	104,2
2014	108,1	107,1	106	103,3	103,3	101,5
2015	99,3	100,6	101,1	103,9	100,3	99,3
2016	104,2	109,4	105,7	110,1	103,1	108,1
2017	103,9	109,1	104,8	107,9	102,8	108,5
2018	103,7	108,9	103,4	108	102,6	108,4

Source: elaborated by the authors

Although Moldova's trade balance continuous to worsen, but the rates are lower, this is due to the most significant evolutions of the exports compared to the imports (historical and forecasted). In 2018 the trade deficit will be 3587 mln. USD. Russia's embargo on wine imports should not influence significantly Moldova's exports. This is explained by changing its structure. (Fig. 1)

Figure 1: Share of the main groups of goods in total exports of the RM
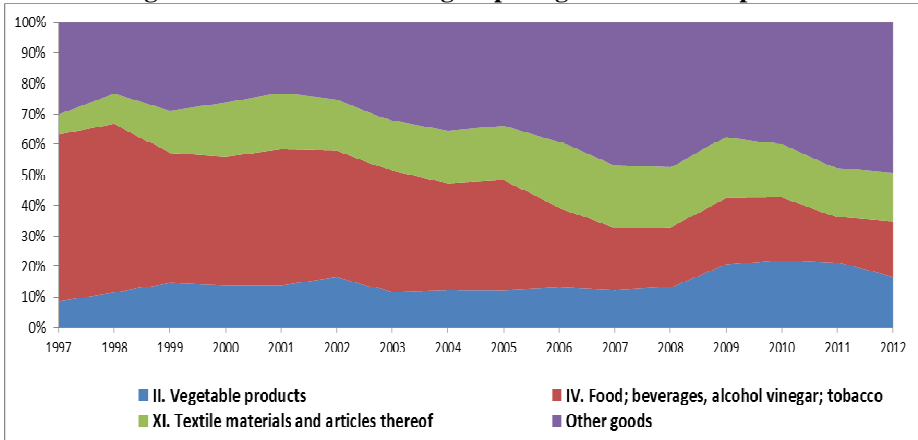
Source: elaborated by the authors, according to the data of National Bureau of Statistics of RM

If, during 1997-1998, the share of group IV, which includes alcoholic beverages, was over 50% of the total exports, and group II - around 10%, then after 2009 they are almost on the same level. Moreover, in 2010 and 2011 group II exceeded group IV. During these years the share of group XI "Textiles and textile articles" has increased, too. These three groups represent 50% of the total exports. In the category of "other goods", in recent years group XVI "Machinery, electrical equipment and parts; sound recorders and image and sound reproducers." has increased its share.

The model predicts a relatively good growth rate for investments into long-term tangible assets (Table 2), although, for a sustainable development their evolution should have a higher rate. The investment expectations for 2014 have not been achieved, which speaks about a lack of investment climate in Moldova. Moreover, a year with a so good economic development did not contribute to attracting investments, which means that there is more work in this area.

Maintaining the pace of the nominal wage growth in 2015 will not cause a good pace of the real wage growth, because they forecast an inflation rate of 7,8%. For the subsequent years there is attested an improvement in the growth rate of the real wage. There will be a decrease in the unemployment

rate, influenced by the economic development of the country and also by the low rate of the economically active population.

An average annual rate of GDP growth of over 6% is now provided by the demand (Figure 2). After a decline in 2009, we see a continuous growth in private consumption in terms of maintaining relatively high remittances.

Figure 2. Evolution of domestic absorption
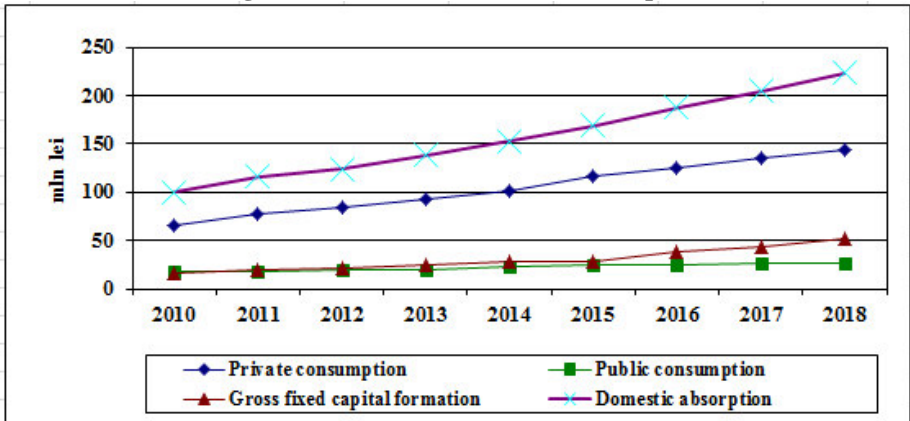
Source: elaborated by the authors

The modest evolution of the gross fixed capital formation is determined by the gradually decreasing average interest rate on loans (in lei), but its growth is much lower than the private consumption.

5. Conclusion

The undertaken forecast can be considered "passive" because the evolution of macroeconomic indicators is largely determined by the external factors included in the model, the prediction of which is appreciated by the IMF and other international institutions. Another important factor for the development of the national economy is remittances - as well an external factor. This forecast is not influenced by any decisions, except those that are related to money supply growth, the exchange rate of the national currency and the average rate on loans granted to the economy. The evolution of the national economy is strongly influenced by external factors. On the one hand, the events in Ukraine, which is an important economic partner of Moldova and

Russia's position as a reaction to the approach of our country to the EU are factors that may adversely affect the economic development of the country. On the other hand, signing the Association Agreement with the EU, signing the Free Trade Agreement with the EU, the financial aid granted by the international institutions, the development strategies for the RM national economy (especially agriculture) proposed by EU are factors that the economic development can benefit from. Being a small economy, the external factors can have a significant influence, but at the same time, we should not diminish the importance of the internal decisional factor that, in its turn, should be able to reduce and mitigate the external shocks.

6. References

- Dobrescu, E. (2006) *Macromodels of the Romanian Market Economy. Bucureşti*: Ed. Economică.
- Dobrescu, E.; Albu, L. (2005) *Dezvoltarea durabilă în România. Modele şi scenarii pe termen mediu şi lung*. Bucureşti. Editura Expert
- Toacă, Z. (2011) Conceptul modelului econometric al economiei naţionale a R. Moldova. În: Creşterea economică în condiţiile internaţionalizării: *Conferinţă ştiinţifică internaţională din 20-21 octombrie 2011*. Chişinău: IEFS, 2011, ed.VI, vol.I p. 405-411, 0,3
- *Cadru Bugetar pe termen mediu pe anii 2015-2017 din 25 martie 2014*. Available at: http://www.mf.gov.md/middlecost/cbtm2015/25martie
- *Word Economic Outlook Database*. Aprilie 2015 edition. Available at: http://www.imf.org/external/pubs/ft/weo/2015/01/weodata/index.aspx.