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IDENTIFICATION OF IMBALANCES IN EMERGING ECONOMIES FOR MACROECONOMIC REGULATORY POLICY ANALYSIS

The article presents main results of the development and approbation of methodological approaches to identification and evaluation of dangerous economic imbalances for the group of countries (Ukraine, Latvia, Estonia, Armenia), which are characterized by similar levels of emerging economy. Research results form the basis of macroeconomic policy analysis in order to prevent future crises and negative trends of economic development.

Keywords: *indicators of threatening economic imbalances; financial and economic crises; emerging economies; models of longitudinal binary type; the concept of index pressure on the currency market; signal approach; binary choice models.*

Among the most important risks, which, under modern conditions, are characterized by catastrophic consequences, are threatening economic imbalances⁸ that may lead to declining economic dynamics, volatility of financial markets, lowering of the standards of living and spread of the crisis. A large number of outstanding economists, in particular B. Bernanke, L. Salahitdinova, I. Deniz, and L. Laeven, prove that it is exactly the global and regional economic imbalances that became factors in the spread of the global financial crisis of 2008-2009.

In recent decades, economic imbalances and external shocks have been particularly characteristic for developing economies and emerging markets⁹, because their economies are less diversified, have lower savings rate, and less developed national financial systems. Besides, those markets are largely open, and the existing mechanisms that should mitigate the impact of the factors of economic instability and block their distribution channels, are not enough efficient and need further development.

Nowadays, there is an increasing need for development and practical implementation of new concepts and methodological approaches to identify and evaluate dangerous economic imbalances¹⁰ for timely warning of crises and negative trends of economic development. To solve this task, developed countries have used mechanisms and guidelines for timely identification of large and persistent macroeconomic imbalances. For instance, G20 countries have agreed to implement indicative guidelines [1], which have been developed with the help of finance ministers and central bank governors of 19 countries and of the European Union. Besides, one of the key components of the European economic governance framework is the *Macroeconomic Imbalance Procedure (MIP)* [2]. MIP is a surveillance mechanism to prevent the emergence of harmful macroeconomic imbalances and correct existent imbalances.

Key indicators of economic imbalances¹¹ and their thresholds can not be used for countries that are not part of the G20 and EU because there are differences between countries by: geographic location, historical evolution, area, provision of resources, degree of integration in the global trade,

⁸ Economic imbalances are deviations of macroeconomic parameters from the overall balance (equilibrium) that arising from the influences of a number of external and internal factors (political, economic, trade, financial, investment, social, technological etc.) on the country's economic development. Existence of threatening economic imbalances in the global economic system demonstrates the need for their timely identification⁸ and prevention of adverse effects.

⁹ Emerging type economies are those developing economies, which are characterized by a large effective area, high economic growth rates, instable overall political situation, and volatility of foreign economic activities.

¹⁰ Quantitative detection of imbalances that may increase threat to the people's living standards, increase the probability of an economic shock, i.e. harmful imbalances.

¹¹ The indicators of economic imbalances will be considered those economic indicators, whose change or move beyond their established limits indicates an increase or decrease in the probability of a crisis. In this case, the threshold values are defined as quantitative parameters describing the permissible level of security of an economic system. The calculated indices of the above mentioned parameters are compared with their "threshold" values and thus characterize the critical economic imbalances. Assessment of economic imbalances forms the basis of macroeconomic policy analysis in the unstable economic situation both for developed and emerging markets.

level of economic development, economic structure, etc. These differences can cause various dynamics of macroeconomic indicators before crisis for different groups of countries and different time periods. Consequently, scientific literature shows the advisability of the solution of the problem of identification of imbalances for the certain group of countries with similar "emerging-type" properties.

To classify 57 countries into homogeneous groups by the characteristics of determination of an emerging economy, cluster analysis was used. We proposed the following classification criteria: index of political instability, GDP per capita, index of ease of doing business, investment risk, economic growth, global innovation index, and the country's area.

From the experimental results obtained, it follows that, Ukraine may be placed in the group of countries (Ukraine, Armenia, Estonia, Latvia), where Estonia and Latvia, by FTSE¹² classification, have characteristics of developed emerging markets (advanced emerging markets). Overall, based on the results of our cluster analysis, Ukraine has a potential for formal admission to the relevant group of countries with emerging economies (e.g., the group of marginal markets (*frontier markets*)), although the identified potential in Ukraine will probably fail to realize in the next future due to the extremely complex conditions primarily caused by the economic situation of political tension and social unrest in the country and, according to FTSE, a noticeable lag in the development of the national stock market.

It is exactly for the group of countries consisting of Ukraine, Latvia, Estonia, and Armenia which, by the results from cluster analysis are characterized by similar levels of emerging economy, that we made selection and evaluation of the indicators identifying dangerous economic imbalances. The analysis of these indicators can be considered as a possible scenario of the early warning of negative trends in the domestic economy.

The information base for the evaluation of the model parameters have been formed from annual data by *International Financial Statistics* of the *IMF* for 1999-2012. The indicators are ratios of nominal or index indicators.

Assuming that threatening imbalances are the direct cause of the crisis, but also using the concept of index pressure on the currency market, the class of econometric models of longitudinal binary type and signal approach, we have concluded that the most adequate for the purposes of prediction, in our study, is the three-factor (panel) *logit*-model. Based on the *F*-test and *Durbin-Hausman-Vue* test, we proved that panel data model with fixed effects has better quality characteristics than the model (*pooled model*) with a total cross section (*F*-test showed that the values of the unique sections have statistically significant differences between each other) and the random effect model (no reason to reject the null hypothesis of intergroup correlation so it is inappropriate to introduce random effects into the model). And the linear model takes the form:

$$x_{jit}^T \beta = -4,98 \cdot x_{1it} + 2,61 \cdot x_{4it} - 3,10 \cdot x_{5it}, \quad (1)$$

where the variables chosen as indicators - potential predictors of negative trends in the economy include ratios: (x_{1it}) *GDP growth (%) to the growth rate of money and quasi-money (%)*; (x_{4it}) *bank loans (at current prices in US dollars) to GDP (at current prices, US dollars)*; (x_{5it}) *bank loans (increase over previous year, %) to inflation (consumer price index, average annual, %)*. Limit values for these variables are presented in Table. 1¹³.

In this case, the calculated values of the criterion of "noise/signal" are as follows: for Armenia – 0,0833, for Estonia – 0,3000, for Latvia – 0,2728 and for Ukraine – 0,7273. In general, for the whole group, the relationship of "noise/signal" was estimated at 0,5455. Thus, the obtained values exceed zero, and are significantly and sufficiently lesser than unity, so the proposed three-factor model (1) can be considered suitable for predicting the likelihood of crises in the selected emerging-type economies and evaluated thresholds can be used for early warning of threatening economic imbalances.

¹² Financial Time Stock Exchange.

¹³ Limit values (respectively *max* and *min*) were evaluated using the formula: indicator's average value ± 2 * standard error.

Table 1

Limit values of indicators potential predictors of negative trends (model 1) of the development of emerging-type economies in the cluster group consisting on Armenia, Estonia, Latvia, and Ukraine

country	Indicators ratios					
	x_{lit}		x_{4it}		x_{5it}	
	min	max	min	max	min	max
Armenia	0,6847	1,2193	0,0387	0,1233	0,5809	1,4789
Estonia	0,4802	1,3078	0,2720	0,6368	0,9542	1,6284
Latvia	0,8072	1,0571	0,1514	0,5939	1,2464	1,5029
Ukraine	0,6272	1,0119	0,2062	0,3573	0,6934	1,5376
Whole group	0,6095	1,1894	-0,0185	0,6134	0,7530	1,6526

Source: author's calculations.

On the basis of binary choice models and the concept of index pressure on the exchange market, we also developed a three-factor probit-model to identify additional indicators of the spread of negative trends in Ukraine's economic development [3]. In this model, the indicators include: national stock indices during period t ; Brent index of oil price, $USD/barrel$; and the ratio of current account balance to GDP. These macro indicators were used to assess the likelihood of economic crisis in Ukraine in the short term. The results of experimental calculations for the developed models have shown that, in the negative scenario of the macroeconomic situation, there is a high likelihood of financial crisis in Ukraine in 2016.

On the whole, the estimated indicators of economic imbalances in 2016 signaled the presence of general macroeconomic imbalances in Ukraine, which gives reason to expect a decline in economic dynamics. Let us analyze possible negative effect on the development of Ukraine's economy.

First, Accelerated growth of prices on global energy markets will lead to increased tariffs for natural gas for the population, will aggravate the problem of high inflation in Ukraine, which, undoubtedly affect the financial market, and, in particular, the bond market through the leveling of the income on them (decreased confidence on the bond market will worsen the condition of Ukraine's financial market).

Secondly, Ukraine's transition to the flexible exchange-rate regime, which, according to the analysis of literature sources, is related to a considerable number of threats (in particular, the raw material orientation of Ukraine's export, this country's underestimated currency unit relative to purchasing power parity, which provokes lowering of the raw material value on the international market, and import of production with a high share of value added whose prices remain stable and high) and promotes the redistribution of Ukraine's national income in favor of this country's trade partners. As a result, Ukraine's economy will face an increasing problem of the search of funds to finance the negative balance of current account, as well as the decrease in the revenue part of the budget.

Thirdly, Decrease in the investment attractiveness of Ukraine's economy for foreign investors, which may become a consequence of the output decline and may have a negative effect on the development of the financial market, macroeconomic stability, balance of payment etc.

The above mentioned risks, in particular, the possible reduction of this country's exports, increase in the energy prices, and lower stock indexes considerably raise the probability of negative tendencies in the development of Ukraine's economy in the short run. Thus, it is advisable to define measures of macroeconomic policy to level such tendencies. Among them:

- strengthening of Ukraine's energy independence, accelerated development of the energy sectors;
- reorientation of the raw material character of Ukraine's economy to the production of items with a considerable share of value added, which should withstand competition not only on the domestic market, but also on the global one;
- the National Bank's weighted decision on the exchange regime in Ukraine, in particular, an assessment maintaining the regime of floating exchange rate;

— promoting efficient development of Ukraine's stock market etc.

Thus, the government and the National Bank of Ukraine should take corrective measures to avoid the expected negative tendencies of the development of Ukraine's economy: first, competition on the domestic market should be supported through lowering a considerable number of administrative barriers, simplifying the procedure for registering organizations and private entrepreneurs, reduction of the list of the licenses activities etc. Secondly, solution of the problems hindering innovative activities of Ukraine's enterprises should be given. In particular, it concerns the instability of political situation, lack of efficient mechanisms for state regulation and control over the attraction of foreign investments, the imperfect character of the corresponding legal base etc.

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