

ECONOMIC SECURITY OF UKRAINE AS REFLECTION OF THE LEVEL OF SOCIAL AND ECONOMIC DEVELOPMENT

KHARAZISHVILI YU.,
*senior research scientist,
doctor of economic sciences,
chief research scientist of the
macroeconomic projections
and shadow economy
studies department of the
National Institution of Strategic Research, Kyiv*

Abstract: *The author proposes a methodology for calculating and projecting the integrated indices of the country's economic security as a final result of its socio-economic development to determine trends and measures contributing to the economic security.*

Key words: *integrated index, indicators, thresholds, level of economic security, socio-economic development.*

Relevance of the issue. Economic security of any state is an integral attribute characterizing the level of development of its economic system, since the system includes a number of subsystems, which are the critical (in the author's opinion) interrelated structural components of security that reflect the functioning of individual areas of economy, including *macroeconomic, investment, financial, social, foreign economic, energy, food, and demographical security*. The above list, which reflects socio-economic aspects, may be added with new components or updated both by components and indicators within each component. In its turn, economic security is a subsystem of a higher level system – the system of the national security achieved via such degree of progress and protection of the economy that fully meets the requirements and needs of the state and its citizens in the process of existence of that state as a whole. The above statement confirms the complexity and many-sidedness of the concept of “economic security”.

The level of economic security in any country is characterized by numerous indicators, each of which may in any given period go up or decline, therefore, one should apply cumulative indices integrated evaluation indices capable to describe the changes in the level of economic security of the state versus fixed threshold values. This is the comparison of the country's economic security level against the above thresholds, which is the key objective of the analysis, since such comparison defines the current level of socio-economic development in light of many aspects of such development. The determination of the movements in the integrated index of the economic security and its components presumes existence of relevant methodology capable to ensure maximum feasible adequate diagnostics

of the level of economic security of the state and its components with further comparison of such level with integrated threshold¹ (ideal) values. Furthermore, relevance of this research is in the fact that under crisis situations occurring due to the cyclical pattern of development of the economy, one should be in the possession of the tools of complex diagnostics of the level of economic security in light of the integrated index to prevent adverse events and threats and to overcome their aftermath.

Analysis of the latest research papers and publications. Among the publications dedicated to the review of the economic security issues, we should distinguish works by *O.I. Baranovskyi* [1], *O.S. Vlasiuk* [2], *Z.S Varnalii* [3], *S.Yu. Glaziev* [4], *V.M. Geyets* [5], *B.V. Gubskiy* [6], *Ya.A. Zhalilo* [7], *T.T. Kovalchuk* [8], *V.I. Muntian* [9], *A.I. Sukhorukov* [10], *V. T. Shlemko* [11], and many others.

The above scientific works offer discussions of the methodological framework of analysis of the economic security in the contemporary environment, concepts and templates of assurance of adequacy of critical components of security; analyze existing threats and propose measures on improvement of the level of economic security. However, given the critical significance of the research, we would highlight the lack of focus on the analyses of the movements in the integrated economic security index and its comparison against integrated thresholds. None of the published works has fully analyzed shadow economic security indices, omission of which makes the assessments of the economic security level inadequate and inconsistent in light of real economy.

We would give proper respect the publications by the officers of the Ministry of Economic Development and Trade [12] of Ukraine and the State Statistics Committee of Ukraine [13], who initiated methodological approaches to the integrated evaluation of the level of economic security of Ukraine and its individual regions, having summarized and consolidated the existing approaches. Obviously, the earliest publications are far from being perfect, albeit they have contributed to further elaboration of the approach. As such, the advantages of the cancelled Guidelines of the Ministry of Economic Development and Trade [12] include the determination and approval of the threshold values vector, including “lower limit, lower threshold, lower statutory index, upper statutory index, upper threshold, upper limit”, which are more progressive in terms of determination of the threshold values versus previously used scalar measurement (as proposed in most above mentioned publications): “no more than”, “no less than”; determination of weighting coefficients applying formalized mathematical method (method of main components), which rules out subjectivism; substantiation of the

¹ Indicators’ thresholds (lower threshold, upper threshold) are quantitative values, which violations give rise to adverse trends in the economy of the country. Ideal values of such indicators (lower, higher optimal values) specify permitted range of those indicators that establish the most favorable conditions of functioning of the state.

method of rotation of factor axes *quartimax* in lieu of *varimax* [13]. At the same time, one of its weaknesses is the absence of the option of application of the threshold values vector for comparison within a uniform scale of movements in the integrated indices and integrated threshold values.

Objective of this work – determine economic security index as reflection of the level of socio-economic development of the country.

Body text. A detailed analysis of the weaknesses of the above mentioned approaches is set forth in the scientific works published by the National Institute of Strategic Research [14-16], where the authors proposed improvements in the methodology of integrated evaluation of Ukraine’s economic security level. The methodology is based on system approach and principles of hierarchy, unambiguity, and continuity. The fundamental principle is the principle of *continuity*, which presumes adjustments of various components, indicators of the system and their threshold values or introduction to the system of new indicators (components) subject to receipt of new data or development of new approaches to calculation of new critical indicators not published by the state statistical bodies before.

The scientists of the National Institute of Strategic Research proposed the following paradigm of the components of the economic security and their underlying indicators (Table 1) [14-15].

Table 1

Components and indicators of economic security of individual regions of Ukraine *

<p><u>1. Macroeconomic security:</u></p> <ul style="list-style-type: none"> - overall productivity (output per production unit) (S); - rate of growth of GDP, % (S); - level of efficiency of production technology (GDP’s share in the output) (S); - scale of shadow economy in the region, % of official GDP (D); - level of utilization of potential opportunities (potential GDP under full load of macroeconomic factors) (S); - level of shadow load of capital, % of official figure (D); - level of shadow intermediary consumption, % of official figure (D).
<p><u>2. Investment security:</u></p> <ul style="list-style-type: none"> - ratio of CAPEX and GRP (Gross Regional Product), % (S); - index of direct foreign investments growth (share capital) versus GDP,%(S); - rate of upgrade of property and equipment, % (S).
<p><u>3. Innovative security:</u></p> <ul style="list-style-type: none"> - R&D expenditures, % of GRP (Gross Regional Product) (S); - scientific and technological progress pace, % per year (S); - investments in innovations, % of GRP (Gross Regional Product) (S); - share of employees involved in R&D, persons per 1000 employees, % (S); - share of enterprises specialized in innovative activities, in total number of industrial enterprises’ employees, % (S);

- share of enterprises that implemented innovations, in total number of industrial enterprises, % (S);
- share of enterprises selling innovative products, in total number of industrial enterprises, % (S);
- share of volume of innovative products within total sales of industrial products, % (S).

4. Financial security:

- economy monetization, %, M3 to GDP (S);
- external debt, % to GDP (D);
- internal debt, % to GDP (D);
- redistribution of GDP via consolidated state budget (ratio of revenues to consolidated GDP) (S);
- budget deficit, % to GDP (D);
- transfers from the state budget to GDP, % (S);
- ratio of expenditures from the consolidated budget and average population, K UAH / person (S);
- shadow revenues of the consolidated budget, % to GDP (D);
- inflation, growth of consumer price index per year, % (D);
- cost of bank loans, % per year (D);
- volumes of lending to real sector of economy, % to GDP (S);
- share of loans to processing enterprises in total loans in economy, % (S);
- ratio of payables from local budget and expenditures from consolidated budget, % (D);
- ratio of receivables from local budget and expenditures from consolidated budget, % (D).

5. Foreign economic security:

- ratio of openness of economy (S);
- export/import coverage ratio (S);
- share of innovative products in commodity exports, % (S);
- ratio of export dependence, % to GDP (S);
- ratio of import dependence, % to GDP (D);
- share of imported goods in domestic consumption, % (D).
- share of supplementary net exports (flows between regions), % to GDP (D);
- share of shadow net export, % to GDP (D).

6. Social security:

- labor utilization level (ratio of optimal demand for labor and its supply) (S);
- share of labor remuneration in total output (S);
- ratio of shadow salary and official salary (D);
- ratio of shadow employment and total employment (D);
- ratio of training costs and GRP (Gross Regional Product), % (S);
- ratio of healthcare costs and GDP, % (S);
- ratio of average salary and minimum subsistence level (S);
- share of salary in personal income structure, % (S);
- households expenditures incurred to purchase food products, as % of total expenditure (S).

7. Food security (consumption rate, person per month, in kg:

- daily food energy value, K kkal (S);
- meat and meat products (S);
- milk and dairy products (S);
- eggs, pieces (S);

- fish and fish products (S);
- sugar (S);
- vegetable oil (S);
- potatoes (S);
- vegetables and cucurbits crop (S);
- fruits, berries, nuts, grapes (S);
- bread and cereal products (S);
- grain production per person per year (S).

8. Demographic security:

- life expectancy at birth, years (S);
- depopulation ratio (D);
- overall death rate (number of deceased per 1000 persons of existing population), *pro mille* (D);
- infant mortality rate (number of infants who die in the age under 1 year, per 1000 newborns), *pro mille* (D);
- overall birth rate, *pro mille* (S);
- morbidity rate (number of newly diagnosed cases) per 100 000 of existing population (D);
- demographic load of efficient population to number of incapacitated persons (effective number of social security contributions payers), % (D).

9. Energy security:

- energy intensity of economy, kg / GDP (D);
- energy intensity of shadow economy, kg / GDP (D);
- share of predominating fuel resource in fuel and energy resources consumption (natural gas), % (D);
- share of imported gas from single country within total gas imports, % (D);
- share of imported oil from single country within total oil imports, % (D);
- share of domestic resources in fuel and energy resources balance, % (S).

* *S* – stimulating factor; *D* – inhibitor;

Given the nonlinearity of the economic processes, the most adequate approach would be the use of multiplicative form of the integrated index, where weighting coefficients are obtained using the method of “*Main components*” of the Statistics Package based on factor analysis and contribution of each factor to the overall dispersion:

$$I_m = \prod_{i=1}^n z_i^{a_i}, \quad \sum a_i = 1, \quad a_i \geq 0, \quad (1)$$

where z_i are normalized values of x_i , where z_i and x_i are related through normalization ratios; a_i are weighted coefficients; n – number of indicators.

The indices are normalized applying maximum values to stimulating factors and applying minimum values to inhibitors, which guarantees continuity of

the function of the integrated index and compliance with the condition of alteration of normalized indices within the range [0, 1]:

$$z_i = \begin{cases} y_i / y_{\max}, & \text{if } y_i \in S; \\ y_{\min} / y_i, & \text{if } y_i \in D. \end{cases} \quad (2)$$

The following threshold values vector is assigned for each indicator: lower threshold, lower optimal, upper optimal, upper threshold. Noteworthy, for inhibitors, the upper and lower threshold (optimal) values change places during determination of their integrated indices. It is recommended to apply author approaches [14-15] when determining these values:

- use of functional dependencies, analytical or statistical;
- use of macroeconomic models that adequately reflect the impacts of destabilizing factors to specific country under the current situation;
- analog (comparison) approach (reference to peer countries' indicators);
- legislative approach (approval of prescribed threshold values on the legislation level);
- expert assessment methods;
- consideration of assessments of international organizations.

To the extent possible, when determining threshold values of economic security indicators, one should give priority to the two first mentioned methods, including application of functional dependencies and macroeconomic modeling.

Therefore, a distinctive feature of the proposed methodology is the application of multiplicative form of the integrated index, simultaneous normalizing of indicators and threshold values, and formalized substantiation of weighting coefficients applying the “Main components” method, enabling to compare within common scale the movements in the integrated index with integrated thresholds – *identify* the status of economic security, which calls for development of relevant measures to be taken to ensure their return to the range of threshold or, even better, optimal values. The threshold values should be revised in light of the economic situation and the objectives put on the agenda at any given stage of development of the economy.

The list of the indicators of the components of the economic security (see table 1) is made up of the “innovative” indicators, such as summarized productivity (output per production facility unit); level of upgrade of property and equipment; level of production technology; share of shadow economy; rate of utilization of potential opportunities (pro forma GDP under full load of macroeconomic factors); share of shadow capital; share of shadow intermediary consumption; rate of scientific and technological process; shadow revenues of the consolidated budget; labor utilization level (ratio of optimal demand for labor and its supply); labor

remuneration in output; rate of shadow salaries; rate of shadow employment; energy intensity of shadow economy, without which the evaluation of the level of the economic security would be inadequate.

The above indicators are allocated to the economic security components to which they are attributable. The application of these indicators has become possible thanks to the application of the functional relations between total demand and total supply based on Neo-Keynesian, neoclassical and monetary approaches pooled within one model – the macroeconomic model of general economic balance named “Alfa” [16], which are ultimate result of assessments within the model.

The function of the cumulative demand $Q_t^D(P_t)$ (dependence of nominal GDP on changes in the prices level P is determined by way of general solution of combined equations of goods market model and money market model with fixed exchange rate and different values of P :

$$\left\{ \begin{array}{l} Q_t^D = F[C_t(Y_t^V, Y_{t-1}^V, T), G_t, E_t(e_t), Z_t(Q_t^D, e_t), I_t(i_t)] \quad - \text{equation IS}; \\ Q_t^D = F[M_t, P_t, i_t] \quad - \text{equation LM}; \end{array} \right. \quad (3)$$

$$Q_t^D = Q_t^D(P_t) - IS - LM \text{ mod } el.$$

where C_t is households consumption; Y_t^V – households available income; Y_{t-1}^V – available income of previous period; T – total taxes (consolidated budget revenues); G_t – consolidated budget expenditures (within the model they are split into state consumption C_g and state investments I_g); E_t – export of goods and services; e_t – UAH/USD exchange rate; Z_t – import of goods and services; I_t – investments; i_t – NBU’s discount (refinancing) rate; M_t – money supply (M2 Money supply); P_t – GDP deflator.

Total supply function $Q_t^S(P_t)$ (dependence of real GDP on changes in GRP deflator is determined by way of general solution of combined equations of labor market model and production model in the form of production function with varying P :

$$\left\{ \begin{array}{l} V_t = e^\eta L_t^{\alpha_t} K_{Z_t}^{1-\alpha_t} = e^\eta [\xi_t N_t^D(P_t) \frac{W_t}{P_t} k_{sn}]^{\alpha_t} [\vartheta_t(I_t) K_t(K_{t-1}, I_{t-1}, A_{t-1}, P_{t-1})]^{1-\alpha_t}, \\ Q_t^S = \sigma_t V_t(P). \end{array} \right. \quad (4)$$

where V_t is production output; P_t – GRP deflator; $e^{\gamma t}$ – scientific and technological progress; γ – scientific and technological progress rate; L – labor costs; K_Z – loaded capital costs; a – coefficient of elasticity; ξ_t – statistical employment factor: share of employed persons plus another category of the employed, reduced to the equivalent of hired persons in total number of economy workers; N^D – optimal demand for labor; W – average annual nominal salary of hired employees; k_{sn} – coefficient of social security salary-related charges; ϑ – coefficient of load on capital; I_t – investments; K_t – cost of capital adjusted by GRP deflator; A_{t-1} – consumption of core capital in the previous period; σ – share of GRP in total output (coefficient of production technology).

Whereas neither cumulative demand, nor cumulative supply taken separately ensure economy balance, because they are calculated referring to a pre-determined prices level, the overall balance in the economy may be obtained only in interaction of all economic subjects operating on all aggregated markets. In analytical form, overall economic balance may be written in the form of transcendental equation with solution equal to deflator GDP (P) and real GDP:

$$Q_t^D(P_t)/P_t - Q_t^S(P_t) = 0. \quad (5)$$

Therefore, using such macromodel, we obtained projected macroindicators to assess the projected economic security indices and, as the final result, projective economic security level indicator.

Therefore, the methodology of determination of Ukraine’s economic security level includes the following stages:

1. Determination of movements in the indicators of the economic security components referring to the data, published by the State Statistics Committee of Ukraine, applying macroeconomic models.
2. Determination of thresholds and optimal values of the indicators.
3. Selection of normalizing coefficients from the range of indicators and threshold values.
4. Transformation of time series of the indicators and threshold values to rule out their negative values.
5. Normalizing the indicators and threshold values applying a single normalizing coefficient to each indicator and its threshold values.
6. Determination of weighting coefficients and threshold values for each component of the economic security applying the “*Main components*” method from the Statistics Package based on the *quartimax* rotation procedure.

7. Determination of time series of the integrated index of each economic security component and integrated indices of threshold values in multiplicative form (1).

8. Determination of weighting coefficients of economic security components (integrated indices of the 1st level) and integrated threshold values applying the “*Main components*” method from the Statistics Package based on the *quartimax* rotation procedure.

9. Determination of time series of the integrated index of economic security and integrated indices of threshold values (integrated indices of the 2nd level) in multiplicative form (1).

From the functional and structural perspective, a country’s economic security may be defined as an aggregate of components of higher level: *economic and social components*. If we add to the above list the *environmental* component, the resulting index would characterize the level of sustained development of the country. Let us define *economic* component as the aggregate of the following areas of economy: macroeconomic, investment, innovative, financial, foreign economic and energy aspects; and *social* component as the aggregate of social (life quality), food and demographic aspects.

Applying proposed methodology of integrated evaluation of economic security components and their threshold values, we will obtain the movements in the integrated indices and threshold values of separate areas of economy, included into *economic and social components* (convolution of the first level). On the second stage, they identify integrated indices and their threshold values for *economic* (Diagram 1, *a*) and *social* (Diagram 1, *b*) components (convolution of the second level).

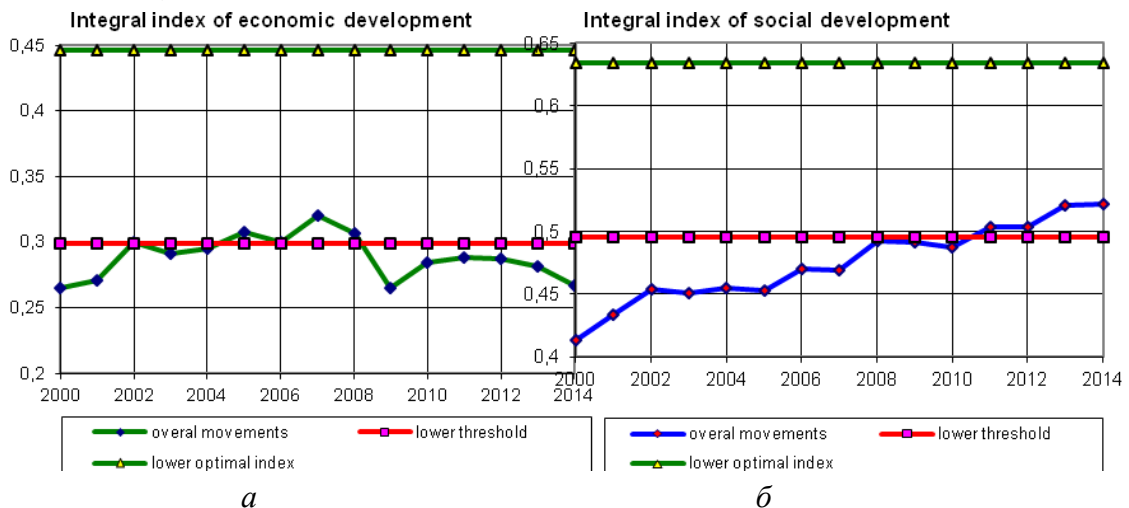


Diagram 1. Movements in the integrated indices of economic (a) and social (b) development

The movements in integrated index of *economic* development are below lower threshold and have downward dynamics, which is the indicator of pre-crisis situation. Out of six components of economic development, three (innovative, investment and financial) are below the lower threshold and have downward dynamics. Macroeconomic and foreign economic components indicators are above optimal value and are characterized by adverse trends. The energy component, albeit its positive trend, is only scarcely above the lower threshold (Diagram 2).

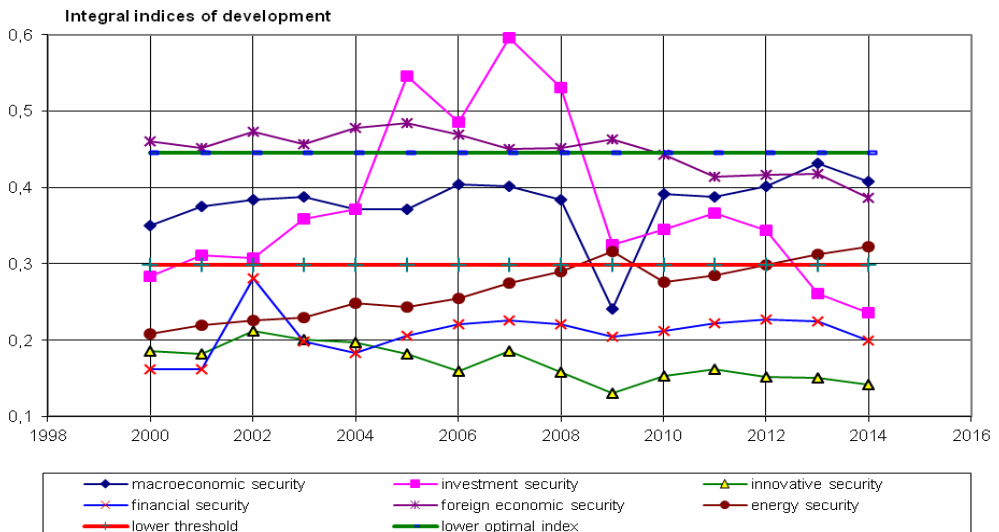


Diagram 2. Movements in the indicators of the economic component of the integrated index

Weighting coefficients of components of economic development are critical figures used to exert controlled influence on the security status. They define the relative significance of individual components, provide necessary information required to design priority leverage measures and are presented as follows (table 2).

Table 2

Weighting coefficients of components of the integrated index of economic development *

Economic security components	Weighting coefficients	Economic security components	Weighting coefficients
1. Macroeconomic	0,129279	6. Financial	0,094867
2. Investment	0,123009	7. Foreign economic	0,230820
3. Innovative	0,217160	8. Energy	0,204865

* Calculations by the author based on the data of the State Statistics Committee of Ukraine and modeling data.

Unlike the movements in the economic development indicators, the movements in the *social* development indicators, albeit their positive dynamics, are only scarcely above the lower threshold. Out of three social development components, the demographic and social components are below the lower threshold and only one – food security – indicator is in the safe zone and has positive dynamics (Diagram 3). Weighting coefficients of the components of the integrated index of social development are presented as follows (table 3).

Table 3

Weighted coefficients of the integrated index of economic development*

EcS components	Weighted coefficients	EcS components	Weighted coefficients
1. Social (quality of life)	0,226769	3. Demographic	0,376448
2. Food	0,396784		

* Calculations by the author based on the data of the State Statistics Committee of Ukraine and modeling data.



Diagram 3. Movements in the indices of the social component of the integrated index

During the third stage, identified are the integrated indices of the level of socio-economic development, which adequately determine the level of economic security of the country, with the share of the economic component comprising **0,5268**, and that of the social component – **0,4732**. Therefore, the country's

economic security reflects the status (level) of socio-economic development (Diagram 4).

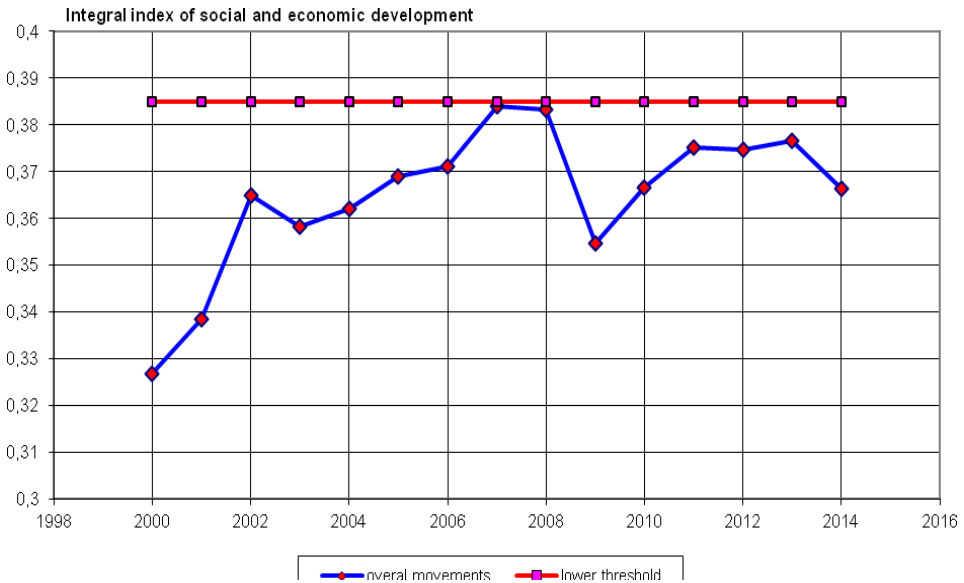


Diagram 4. Movements in Ukraine’s integrated index of socio-economic development

As it seen from the calculations, the level of Ukraine’s socio-economic development (level of economic security) has not changed significantly for the past 12 years, and is below the lower threshold, i.e. in risky zone, which is an evidence of inefficiency of the current economic development model and macroeconomic policy on the whole. This situation is the result of the fact that most components are below the lower threshold, namely: out of 9 economic security components, 5 are below the lower security threshold (investment, innovative, social, demographic, and energy), which indicates the existence of adverse trends in the economy of the state. Two economic security components (macroeconomic and foreign economic components) are just by a narrow margin above the lower threshold, and only two components (financial and food security) are in the safe zone (well above lower threshold), although with adverse trends in the financial security area in 2013-2014.

Conclusions

Application of the methodology designed by the National Institute of Strategic Research makes it possible to assess each economic security component, to make projections, and to identify the components to be addressed on a priority basis. The proposed methodology makes it possible to compare within the same

scale the movements in the integrated index against integrated thresholds, i.e. to correctly *identify* the level of economic security (the degree of the socio-economic development), and envisages timely revision of the thresholds subject to the economic situation and targets and objectives defined at a given stage of development of the national economy. The proposed functional and structural approach to the integrated evaluation of the level of economic security of Ukraine makes it possible to evaluate the level of economic security of Ukraine as the ultimate outcome of the socio-economic development; to expand the integrated index in a system of components and indicators of the economic security with their own weighted coefficients to be used to identify the “*bottlenecks*” and to elaborate improvement measures addressing underlying structural elements.

REFERENCES:

1. *O.I. Baranovskyi* Financial security of Ukraine (evaluation methodology and mechanisms) / *O.I. Baranovskyi* – Kyiv National University of Trade and Economics. – K.: KNUTE.– 2004.– page 760.
1. *Vlasiuk O.S.* Theory and Practice of Economic Security in the System of Economic Sciences / *Vlasiuk O.S.* – National Institute of International Security of the National Security Council of Ukraine: Monography. – K., 2008. – page 48.
2. *Z.S Varnalii.* Economic Security of Ukraine: Challenges and Priorities: / *Z.S Varnalii, D.D. Burkaltseva, O.S. Sayenko.* – K.: Znannia Ukrainy, 2011. – page 299.
3. *S.Yu. Glaziev.* The Basis of a Country’s Economic Security – an Alternative Course of Reforms / *S.Yu. Glaziev* // Russian Economic Magazine. – No. 1.– 1997. – pages 3–17; *Illarionov A.* Economic Security Priorities / *Illarionov A.* [Web resource]. – May be accessed at: www.iea.ru/article/publ/vopr/1998_10.pdf
4. A Concept of Economic Security of Ukraine / *V.M. Geyets* et al.; Ukrainian National Academy of Sciences, Institute of Economic Projections. – K. : Logos, 1999. – page 56; Models of Economic Security: State, Region, Enterprise: Monography / *V. M. Geyets, M.O. Kyzym, T.S. Klebanova, O.I. Cherniak.* – X.: Kharkiv National Economic University, 2006. – page 240.
5. *B.V. Gubskiy* Economic Security of Ukraine: Methodology of Assessment, Current Level, and Strategy of Assurance: Monography / *B.V. Gubskiy.* – K.: Ukrarkhbudinform, 2001. - page 122.
6. *Ya.A. Zhalilo.* Strategy of Assurance of Economic Security of Ukraine. Priorities and Challenges of Implementation / *Ya.A. Zhalilo.* – Ukraine’s National Security Strategy in the Context of Global Experience. – K.: Satsanga, 2001. – page 224.
7. *T.T. Kovalchuk* Economic Security and Politics: a Case Study from Professional Analyst / *T.T. Kovalchuk.* – K. : Znannia, 2004. – page 638.

8. *V.I. Muntian* Economic Security of Ukraine / *V.I. Muntian*. – K.: KVITs, 1999. – page 462.
9. Methodology Guide on Assessment of the Level of Economic Security of Ukraine / National Institute of International Security; edited by *A.I. Sukhorukova*. – K., 2003. – page 64. System of Economic Security of State / edited by doctor of economic sciences, professor *A.I. Sukhorukova* / National Institute of International Security of the National Security Council of Ukraine. – K.: DV Stylos, 2010. – page 685.
10. *V.T. Shlemko* Economic Security of Ukraine: Substance and Areas of Assurance. / *V.T. Shlemko*, *I.F. Binko*. – K.: National Institute of Strategic Research, 1997. – page 144.
11. *A Methodology for Assessment of the Level of Economic Security of Ukraine*, approved by Order No. 60 of the Ministry of Economy of Ukraine dated 2.03.2007 [Web resource]: May be accessed at: me.kmu.gov.ua/control/uk/publish/article?art_id
12. On Approval of the Methodology for Assessment of Integrated Regional Indices of Economic Development / State Statistics Committee of Ukraine: Order No. 114 dated 15.04.2003 [Web resource]: May be accessed at: uazakon.com/documents/date_1a/pg_ibcnog/
13. *Yu.M. Kharazishvili*. On Improvement of Methodology for Assessment of Integrated Regional Indices of Economic Security of Ukraine: Analytical note / *Yu.M. Kharazishvili*, *A.I. Sukhorukov*, *T.P. Krupenytska* – National Institute of Strategic Research, September 2013. [Web resource]: May be accessed at: <http://www.niss.gov.ua/articles/1358/>;
14. *A.I. Sukhorukov*. On Methodology for Complex Assessment of Components of Economic Security of State / *A.I.*, *Yu. M.Kharazishvili* // Strategic priorities. – 2013. - No.3 (28). – pages 5 - 15.
15. *Yu.M. Kharazishvili* Theoretical Background of the System Modeling of Ukraine’s Socio-Economic Development / *Yu. M. Kharazishvili*. – K. : Poligraf Konsalting LLC, 2007. – page 324. (Monography); *Sukhorukov A.I.* Modeling and Projecting Scenarios of Socio-Economic Development of Ukraine’s Regions: Monography / *A.I. Sukhorukov.*, *Yu.M. Kharazishvili*. – K.: National Institute of Strategic Research, 2012. – page 368.