

PRIORITIES OF STATE POLICY DEVELOPMENT TO PROVIDE THE ECONOMIC SECURITY OF INDUSTRIAL COMPLEX

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Abstract: Current trends taking place in national economy have a negative impact on the level of economic security of the industrial complex. The methods of PLM-SM analysis allow to determine the key factors that have the greatest impact on the level of economic security in the industrial complex. It should be noted that the transformation of exogenous factors into endogenous ones is possible within meso-level systems, which requires the consideration of territorial-branch complex functioning specifics in order to maximize the effective use of the accumulated resource potential.

Keywords: economic security, state policy, industrial complex

1 Introduction

The structural changes in Ukraine's agrarian economy and their orientation towards economic and social efficiency are taking place in complex and controversial conditions, with continuing decline in agriculture and degradation of rural territories. The existing agricultural potential remains unrealized and its conditions far from meeting the needs of the village. The current situation is extremely complicated as Ukraine has not, within the two years of reforms, sufficiently increased the efficiency of agricultural production, nor has it carried out technical and technological re-equipment and implemented an innovative model of development in this sector. Under administrative command economy, the innovative development of agricultural complex was purely declarative and was not implemented. First, innovation programs in agrarian and industrial complex were funded by the residual principle. On the contrary, plans of the development of military, space and aircraft technologies were implemented efficiently and at the global level. Second, programs of scientific-technical development were financed from the state budget only.

The exogenous factors of economic security level decline within the national economy in general and within industry in particular were the sharp increase in geopolitical risks in 2014 and the further introduction of financial and sectoral technological sanc-

tions, which led to the worsening of conditions, especially for foreign economic activity and the main articles of Russian export. The trend of investment reduction starts to develop since 2014. The decrease of economic activity in virtually all sectors is observed, especially the decline in production is evident within the processing and wholesale-retail trade sectors. The subsequent sharp devaluation of national currency led to the reduction in domestic solvent demand and to the increase in RF CB refinancing rate, which actually blocked the access to credit resources. Thus, a radical revision of development plans and the deformation of long-term goals towards a survival strategy started at industrial enterprises (Idrisov et al,2014), which affects negatively the level of industrial complex economic security.

Thus, it is very important to develop an industrial policy aimed at the stabilization and the creation of a sustainable trend in industries taking into account the following factors:

- the introduction of sectoral sanctions, on the one hand, limits the development of individual industries in the short term, but it can stimulate the development of domestic producers and import substitution in the long term;
- the restriction of access to global capital markets, which leads to the narrowing of the existing resource base and which is the key deterrent to the growth of investment activity, including in industry, and the sectoral modernization of the Russian economy;
- the increase of risk level in the conduct of business, making a negative impact on the economic activity of economic entities, as the likelihood of a mobilization development option implementation grows, which also makes a negative influence on the dynamics of direct foreign investment;
- a sharp qualitative change in terms of trade. Due to the devaluation of the national currency export-oriented enterprises witness the increase in ruble revenue, whereas the currency depreciation increased the competitiveness of their products for the enterprises oriented at the domestic market through the growth of imported good prices.

2. Modern Trends of Industrial Complex Development

It is necessary to take into account that the specific weight of final imported products at domestic markets is quite large in certain industrial complexes. Thus, its sharp rise in price leads to the creation of restrictions for the corresponding productions. As can be seen from Table 1, the share of imports remains very significant for a number of enlarged commodity categories, especially in machine, machine-tool industry and information technology, since the bulk of it is not produced in Russia.

Table 1 - The share of imported products at the domestic market for various industries, %

Industry branch	Import products share, %
Heavy engineering	60,4
Power engineering	19,7
Electrical and cable industry	26,2
Oil and gas machine building	60,8
Machine-tool industry	88,4
Light industry	72,5
Radioelectronic industry	82,0
Chemical industry	9,7
Pharmaceutical industry	73,0
Medical industry	81,2
Automotive industry	44,6
Transport engineering	24,7
Agricultural engineering	56,1
Information technologies (IT)	93,5

It is obvious that the increase of prices for imported products creates significant incentives for the development of import-

substituting industries. However, its successful implementation is possible only through the modernization of production facili-

ties and the introduction of advanced technologies.

The analysis of statistical information confirms the presence of a potential and a hidden reserve in the industrial complex to develop the import substitution. At the same time there is a high dependence of Russian industry on the supply of imported raw

materials and equipment. For example, the share of imports in total expenditures for raw materials and the materials in machine building exceeds 35% on average: machinery and equipment production makes 38.1%, the production of vehicles and equipment makes 36.9%; In other sections it exceeds or approaches 20% (Table 2).

Table 2 - The share of expenses for imported raw materials and materials within the expenses for the acquisition of components in production and product sale, %

Branch	Imported raw material, material share in expenses, %
Manufacture of machinery and equipment	38,1
Manufacture of vehicles and equipment	36,9
Textile and clothing manufacture	26,7
Manufacture of rubber and plastic products	22,0
Manufacture of electrical, electronic and optical equipment	20,5
Chemical production	19,6
Pulp and paper production; Publishing and printing activities	19,3
Manufacture of food products	13,9
Manufacture of leather, leather goods and footwear	11,4
Wood processing and production of wood items	10,2
Metallurgical production and the manufacture of finished metal products	6,2
Extraction of fuel and energy minerals	1,0
Manufacture of coke, refined petroleum products and nuclear materials	0,8
Production and distribution of electricity, gas and water	0,6

Taking into account the low level of profitability in industry (except for petrochemical industry and other export-oriented industries), the risks of financial insolvency are growing, especially for the enterprises focused mainly on the domestic market, the products of which consist of imported components. Also, the inaccessibility of credit resources for the modernization of fixed assets hinders the restoration of economic security level among industries.

The absence of import substitution industry orientation to external markets, an ineffective and a highly selective discretionary state support, the growth of the public sector and the deterioration of competition, the support of inefficient production in the framework of state program implementation for sectoral development, the reduction of real population income and an effective demand also contribute to the economic security level reduction. It is also necessary to take into account the existing non-market mechanisms of administrative pressure on production and trading companies.

In this situation, it is necessary to develop an effective industrial policy in the context of economic security level increase among industrial complexes, which will create the opportunities for a qualitative transition to the innovative structure of economy, including the integration into global added value chains, the development of advanced competitive productions in terms of resource and technological modernization, the targeted support of perspective investment projects.

3 Estimation Model Of Industrial Complex Economic Safety Level

An acceptable level of economic security is developed through the harmonization of system-forming processes, the stable functioning of which is ensured by the combination of territorial and interbranch balance ratios between the components of territorial industrial complexes. In this regard, we fully agree with G.B. Kleiner's opinion, who claims that "the stability of a social-economic system functioning is possible provided that its basic internal structure and the structure of its external environment are balanced" (Kleiner,2015). This interpretation confirms the need for a detailed analysis of the factors influencing the level of the industrial complex economic security and determining the key trends of strategic development, taking into account endogenous features and exogenous volatility. From the standpoint of economic and mathematical modeling, this means the need to consider the following features:

- the transformation of state policy in terms of the industrial complex support and its impact on the level of economic security;
- the analysis of internal processes that are related to the specific functioning of the subject, the object and the design subsystems of the territorial and sectoral complex of an area, and determining the potential trajectory of the national economy sustainable development.

In order to evaluate the factors which influence the level of the industrial complex economic security, a modified toolkit of correlation-regression analysis was used.

PLS-PM (Partial Least Squares Path Modeling or Project on Latent Structures Path Modeling) methods were developed and tested in applied research during the 70s of the XXth century. In the economic sphere Herman Wold (Wold,1975) was the founder of this tool. He developed the basic principles of PLS-PM modeling.

The choice of this methodology for the purposes of economic security level analysis in respect of the industrial complex is determined by two aspects: PLS-PM tools are suitable for the evaluation of the relationships between latent (implicit) variables; This technique is suitable to analyze high dimensionality data in the conditions of a weakly structured medium.

Each block of input data X_j is associated with a latent variable LP_j representing an abstract value (i.e. immeasurable one). In this case, the estimation of a hidden variable is carried out in accordance with the formula (1):

$$LP_j = Y_j \quad (1)$$

The whole set of relations between the variables can be grouped into two blocks: "the relations between the latent variables and the corresponding blocks X_j (these relations form an external model) and the latent variable relations with each other (these relations form an internal model)" (Wold,1973).

The endogenous model is put down in the form of a standard system of linear equations (2):

$$LP_j = \delta_0 + \sum_{i \rightarrow j} \delta_{ji} LP_i + \varepsilon_j \quad (2)$$

where LP_i are implicit variables that influence LP_j ; δ_{ji} ratios are the path coefficients characterizing the tightness and the direction of a relation between the variables LP_i and LP_j ; δ_0 – free member; ε_j – the residual sequence of an endogenous model.

This model must meet the following requirements:

- the system of linear equations must be recursive one;
- an endogenous model and the individual equations of the system are regressive ones;
- the residual sequence should be independent of the explained variables.

Exogenous model shows the relation between latent and explicit variables. For the purposes of this study, the reflective type of the model was chosen. This is due to the fact that "Reflective ("reflecting") type is the type of external models in which the latent variable is the "cause" of explicit variables, i.e. explicit variables "reflect" the latent one".

$$X_{jk} = \gamma_{jk} LV + \varepsilon_{jk} \tag{3}$$

where γ_{jk} – load ratios, γ_{0jk} – free members, ε_{jk} – the residual sequence of the exogenous model.

Formulae (2) and (3) describe the specification of exogenous and endogenous models on the basis of latent variables LP_j parameters application, which are determined by the obtaining of a linear combination of the corresponding explicit variables.

$$LP_j = Y_j = \sum_k w_{jk} X_{jk} \tag{4}$$

where w_{jk} – the external weights of the model.

The development of PLS-PM model is based on the use of an algorithm that includes three basic steps:

"calculation of external weights to obtain the estimates of latent variables (w_{jk});

calculation of the path coefficients of the internal model (γ_{ji});

calculation of external model loads (γ_{jk})» (IMF,2007).

Let us analyze the indicators characterizing the level of economic security in the processing industry. Latent variables in our case are the blocks that include the following explicit indicators:

- Social: the average level of wages in an industrial branch (SRZ); the unemployment rate in an industrial branch (VBO); the amount of environmental costs (ZEK);
- economic: the share of imported products at the domestic market for processing industries (DIP); the share of costs for imported raw materials and the materials in the costs of raw material and material purchase for the production and sales of products (ISR); Sectoral investment volume (DIN); Tax debt (NZA);
- state policy: the volume of public expenditure in the framework of the sectoral support program implementation (GRR); The volume of tax benefits (VNL); The level of administrative pressure (ADD);
- economic security: depreciation of fixed assets (IOF); Tax revenue (NPO); Volume of industrial production (OPR); Balance of foreign trade balance (SIE).

The graphically analytical model of the study is presented on Figure 1. Latent variables are ovals, and explicit variables are rectangles. The interrelation of latent variables is an endogenous part of the model, and the interrelationships of latent blocks with explicit indicators characterize an exogenous part of a model.

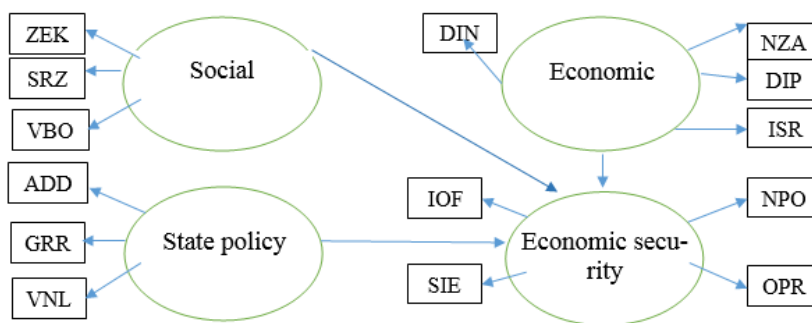


Figure 1 – Model of industry economic security provision

4 Empirical Results Of Economic Safety Level Evaluation In Industry

Empirical results were obtained using the software Statistika on the basis of statistical data array on individual industries of Russian Federation from 2012 to 2016 according to the following algorithm:

- the verification of endogenous agreement on model blocks;
- the evaluation of an exogenous model variable significance;
- the verification of multicollinearity presence in latent and explicit variables both within blocks and between them;
- the assessment of an endogenous model quality;
- the estimation of model adequacy according to the index of model conformity to the initial data;
- the model optimization.

Table 3 provides the estimates of structural model equation for the evaluation of parameters, as well as the results of model adequacy estimation as a whole and its components on the basis of t-statistics.

Table 3 – Evaluation of internal model adequacy

Latent variables	χ^2 evaluation	Standard error, SEp .	t-statistics	$Pr(> t)$
Free member	2,1628E-17	0,0853	2,534E-16	1
Social	0,19028279	0,1190	1,59824	0,1249
State poluicy	0,64313833	0,1670	3,84967	0,0009
Economy	0,41436382	0,1396	2,96808	0,0073

The criterion of t-statistics is fulfilled for the blocks "Economy" and "State Policy" ($Pr(> |t|) < 0.05$) and is not fulfilled for the block "Social" ($Pr(> |t|) > 0.05$). Therefore, it is necessary to

optimize the model by excluding this block from further consideration. Table 4 presents the summary statistics of an optimized structural model.

Table 4 - Summary statistics of the internal model

Block	R^2	Share of reproducible variability, BC	Extracted dispersion share, AVE
State policy	0,00	0,85	0,85
Economy	0,00	0,69	0,69
Economic safety	0,81	0,80	0,80

The value of the determination coefficient R^2 for the "Economic Security" block exceeds 0.8. Consequently, the share of the explained variation, which is reproduced by the remaining latent variables, makes 81%. For all blocks, the share of the extracted dispersion exceeds 0.6, i.e. the average specific weight of the block indicator dispersion, explained by the latent variable of the block makes 69% for the block "Economy" and 85% for "State policy" block. According to the proportion of reproducible variability, the endogenous model is also considered as an adequate one.

The computation of the Goodness-of-Fit (GoF) aggregate quality factor allows to characterize "the quality of an internal system model and an external one, and serves as an indicator of the model predictive reliability" (Our Common Journey, 1999). "The predictive reliability of the model is considered as a high one if the GoF coefficient exceeds 70%" (Our Common Journey, 1999). In our case, the coefficient value was 82%.

An endogenous model of the system has the following form:

$$LP_{EcBez} = 0,53LP_{GosPol} + 0,47LP_{Econ} + \varepsilon_{EcBez} \quad (5)$$

Latent variables are expressed in terms of explicit indicators as follows:

$$\begin{cases} LP_{EcBez} = 0,44X_{IOF} + 0,38X_{OPR} + 0,32X_{NPO} \\ LP_{GosPol} = 0,40X_{GRR} + 0,36(1 - X_{ADD}) + 0,33X_{VNL} \\ LP_{Econ} = 0,48X_{DIN} - 0,53X_{ISR} - 0,42X_{DIP} \end{cases} \quad (6)$$

According to the simulation results, a latent variable characterizing the level of industrial complex economic security is directly influenced by other latent variables that demonstrate the effectiveness of government policies concerning the support of individual industries, as well as the general level of an economic situation in the industrial complex. The level of economic security is expressed through the first equation of the system through indicators (6). In its turn, the second and the third equations of the system make it possible to estimate the remaining latent variables via explicit indicators.

According to the obtained results, it is possible to analyze the level of economic security through the evaluation of three explicit indicators:

- depreciation of fixed assets;
- tax revenues;
- the volume of industrial production.

The economic component of industrial complex safety is characterized by the following indicators:

- the share of imported products at the domestic market for

processing industries;

- the share of costs for imported raw materials and the materials in the costs of raw materials and the materials for the production and sale of products;
- the volume of investments in industrial sectors.

The evaluation of public policy effectiveness in the context of economic security provision can be carried out using:

- the volume of public expenditure in the framework of sectoral support program implementation;
- the volume of tax benefits;
- the level of administrative pressure.

On the basis of the obtained model, it is possible to determine the dynamic values of latent variables, the creation of multi-variable forecast models at the level of the industrial complex economic security. It is also possible to develop a monitoring system to assess the economic security based on selected explicit indicators.

Thus, the economic security of the industrial complex can be determined by the comparison of the obtained values for the blocks during a certain time interval and on the basis of the selected indicators. In general, two basic options are possible:

- the estimate of latent variables/blocks of the current period are less than the estimates of the basic period (it is reasonable to take the period when the level of economic security was acceptable as a base period). In this case, the level of economic security has a steady downward trend;
- the evaluation of the current period block is higher or lower than the estimate of the previous period block, however, it exceeds the basic one, then there is no stable trend, but the level of economic security is sufficient.

5 State Policy Priorities Ensuring Industrial Complex Economic Safety

From the point of view of economic security level increase the developed intra-industry conditions are determined by the stable functioning of economic entities and allow to adjust their behavior, on the one hand, and change the priorities of the state policy concerning industrial complex support, on the other. At that it should be taken into account that economic security and the system of state strategic planning are closely related: "there are integrating dependencies between these elements on the basis of which some elements of the system "help" or "replace" other elements to maintain the balance of its functioning, giving the controlled character to processes conditioned by the influence of external factors" (Raizberg, 2008). Consequently, there is the possibility of influence within the sectoral level on the sustainable and progressive development of the entire industrial complex by transforming the endogenous economic proportions that form its optimal structure, as well as by "the dampening of negative impulses coming from the top to the bottom and from the bottom up" (Raizberg, 2008).

The change of exogenous factors into endogenous ones can be considered using the following example. After the introduction of industry sanctions and the start of the import substitution program, the RF Government determined the list of critical technologies the presence of which influences the level of national security directly (The plan of priority measures to ensure the sustainable development of economy and social stability in 2015). This list formed the basis for the development and the implementation of government programs to support individual industries, including processing ones. The aggregate of state support instruments within the framework of these programs implementation is an exogenous factor in relation to the territorial and sectoral complexes that have a potentially positive impact on the sustainable development of economic entities. Although, according to some authors, the provision of tax incentives can act as an endogenous factor for the meso-level system (Tanzi,1997). In its turn, the tasks of ensuring the necessary level of economic security at the meso-level through the establishment of import-substituting product manufacture are analyzed through the system of sectoral potential and regional specifics evaluation: the availability of leading enterprises that have a high territorial status; The level of the existing material and technical base; Scientific potential for the introduction of innovative productions; The possibility of access to credit resources and the availability of necessary human resources, etc. Thus, the final assessment of implementing the state programs implementation feasibility to support territorial-sectoral complexes is directly dependent on endogenous factors.

According to the assessment results and taking into account such macroeconomic factors as market conditions, the policy of RF Central Bank, etc., the sectoral and regional programs for economic security improvement are developed, providing for managerial impacts that will ensure the achievement of the set goals and the maintenance of sustainable development parameters of territorial industrial complexes.

The importance of a centralized state program availability to support the industrial complex is also conditioned by the fact that purely market investment mechanisms can have a negative effect, which will be expressed in the further growth of structural disproportions in the regional reproduction system and, as a result, in an ineffective use of the available social and economic potential. The President V. Putin noted: "It is very difficult to reorient economic activity actors to engage in the things that are less profitable than oil and gas, or their derivatives, for example, mineral fertilizers that are made from gas" (Putin proposes to create 25 million jobs in the non-primary sector of the economy (electronic resource,2012).

For the economy of southern Russia regions, where the share of agricultural products in the structure of export-import operations is high (22% of exports and 25.5% of imports), sanctions made it possible to intensify the hidden potential of the agro-industrial complex in the regions. Consequently, the GRP sectoral structure, the type of structure and other factors can have a direct impact on the level of territorial-sectoral complex adaptation to the imposition of sanctions. Some authors note the following: "it is possible to change exogenous factors into intrasystemic ones in each region that will determine the potential for activation and a sustainable growth of endogenous social-economic potential and, thus, will increase the level of economic security" (Tatarkin,2011).

In modern conditions, the intensive type factors that ensure the implementation of promising investment projects and developing the modernization basis in motion from an extensive use of the accumulated resource potential to the introduction of advanced production facilities and the use of modern technologies, including innovations in management.

Thus, investment projects implemented within the framework of public-private partnership aimed at the creation of new production chain system, focused at the achievement of a final result with the

possible inclusion of the macroregion specific regions in these relations, including underdeveloped ones, can become the main drivers of economic security growth in the non-primary sector of industry at the regions of southern Russia. It is advisable to create large territorial and industrial production clusters, which will unite enterprises within the framework of a single technological, production and sales chain. The strategic goal of these clusters operation should be the reduction of costs share for imported raw materials and the materials in the structure of costs, the decrease in the share of imported products at the domestic market, and the tax potential increase among industrial complexes and regions.

The following factors will be the restrictive ones: high depreciation of fixed assets and outdated material and technical base, a limited access to financial resources, significant administrative pressure, especially on the part of audit bodies.

It should also be taken into account that it is impossible to focus only on certain factors in the context of economic security level increase of the industrial complex. It is necessary to have a comprehensive program of an effective integration concerning technical, technological, scientific, educational, and financial and innovation potentials of territorial industrial sector complexes on the basis of large-scale investment project implementation not only by large-scale enterprises, but also by integration structures in the production and infrastructure spheres, and, thus, the achievement of maximum synergistic and multiplicative effect.

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