

SIMULATION OF THE DISTRIBUTION OF FIXATION OF IMPACT OF THREATS FROM INTERNAL AND EXTERNAL ENVIRONMENTS ON ECONOMIC PROTECTABILITY OF ENTERPRISE

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Abstract. The conceptual approach to simulation of the distribution of fixation of impact of threats from internal and external environments on the current state of economic protectability of enterprise, that allows monitoring its integrity and further dynamics with maximum precision with the participation of optimally proposed number of parameters-indicators in terms of inputted components of integrated economic protection of business entity, is formed in the work.

Key words: economic protectability, enterprise, impact of threats, internal and external environment, simulation, parameters-indicators.

Formulation of the problem. Unfavorable conditions of management, prevailing in the post-crisis period at some domestic industrial enterprises, continue to focus the attention on the search and implementation at them of diagnostic methods of assessment and control of protective functions in order to make on these business entities the effective decisions concerning stabilization of financial and economic situation. The problem of necessity of implementation of in-depth simulation of the distribution of fixation of impact of threats from internal and external environments on the state of economic protectability of enterprise with the participation of optimum quantity of inputted parameters-indicators that will allow us differentially in a short time to more carefully treat the qualitative management of complex impact of all threats on the integrity of the protection and to overcome the downward trend of state of economic protectability of industrial enterprise, by timely neutralizing the destabilizing action of some threats simultaneously improving in general its economic stability is connected with this.

Analysis of recent researches and publications. Domestic and foreign experience shows that the problem of protection arises before

every enterprise of any form of ownership, especially if it aspires to continue to function with acceptable financial and economic results in the crisis or post-crisis period, when the level of market uncertainty is maximum due to the imposition and prolongation for indefinite period of the greatest number of different identified risks that comprehensively burden the whole entrepreneurial activities.

Complex system of economic protection of enterprise in this situation is always based on the minimization of external and internal threats that affect the financial and economic stability of business entity [1, p. 26], that remains under any conditions the main indicator of its activities.

In scientific publications of I.O. Blank, T.H.Vasylytsiv, N.V. Vashchenko, L.I. Donets, O.A. Zayichkovskiy, T.M. Ivanyuta, M.I. Kamlyk, V.I. Kyrylenko, M.B. Tumar [2; 3; 4; 5; 6; 7; 8] and of many other scientists the economic protection of enterprise was considered comprehensively first of all with the help of the mechanism of management of its financial and economic activities and evaluation of the results namely through results of optimization of cash flows, investment activity and efficiency of investments, financial risks, management of financial innovations, management of financial stability of enterprise, through financial profitability and formation of financial resources etcetera. Most of them connected the main task of reforming of business entities with the necessity of activization and escalating of their potential simultaneously overcoming just randomness of internal state and external activities, increase of the predictability of their functioning through the mechanism of ensuring of a potential protection [4, p. 12]. It means that a significant number of scientists did not give the preference to economic protectability of enterprise not separating it from their understanding of economic security in the

spectrum, firstly, of narrowed number of its components for strict economic protection: innovative, financial and credit and investment, and secondly did not take into account the element of simulation of the distribution of fixation of impact of threats from internal and external environments on its current state that allows simulating control over its further dynamics in the complex system of protection accurately with the participation of beforehand proposed optimum number of parameters-indicators in terms of inputted components of economic protectability of business entity.

Analysis of scientific sources showed that in the countries with developed market economy and with stable political and economic systems the decline of the level of economic protectability and full bankruptcy of enterprises only by 1/3 are caused by external factors and by 2/3 – by the internal [9, p. 8]. The distribution of these factors in the countries with a deficit of state budget, Ukraine belongs to, can be significantly distorted and be vice versa – 60 % and 40 %, respectively, since country and production structures that belong to enterprises of most strategic sectors of economy, maintain numerous financial and economic relations with external environment in order to solve financial problems at the expense of foreign investments, purchase of import raw material, spare parts, that is equally typical for any branch of industry for example for both the production of machinery products and light industry products.

However, none of the researchers have yet considered the possibility of simulation of the selection of parameters-indicators that would fix the above mentioned ratio of the impact of threats from internal (40 %) and external (60 %) environments on economic protectability of domestic industrial enterprises, maintaining the integrity of the formed system of economic protection of industrial and economic structure. Especially it is important for those business entities that can not differentially single out all threats that prevent the preservation of an acceptable level of their economic protectability.

Objectives of the work. Purpose of the work is to propose a conceptual approach concerning the distribution of fixation of impact of threats from internal and external environments (in a specified ratio) on the current state of economic protectability of enterprise comprehensively optimizing the appropriate number of selected parameters-

indicators in terms of inputted components of integrated economic protection of business entity.

Presentation of the main material of the research. To achieve economic efficiency of functioning of the system of economic protection of separately taken business entity there is needed not only rational applied method of diagnostics of the level of its economic protectability, but also the preceding to it an effective apparatus of simulation of distribution of fixation of impact of threats from internal and external environments on state of economic protectability of enterprise that allows us with the participation of a number of parameters-indicators that fix the quality of the flow of innovative, financial and credit and investment spheres of the activities of business entity with maximum precision to control further dynamics of its economic protectability in order to prevent its downward trend. It was found that in order to get out of crisis state of a number of enterprises and to increase the level of their economic protectability first of all the technical reconstruction is necessary, the result of which is the increase of the qualitative state of production base and achievement of such their level of technique and technology that would give the domestic industrial and economic structures an opportunity to resist the external environment producing products of high quality and ensuring its competitiveness in global markets [10]. However it should be taken into account the fact that it is complicated to quickly technically reconstruct such enterprises and to maximize their income from the sale of finished products, especially because of totality of negative uncontrolled factors of external environment. Although it is possible to manage them.

In general the factors that form the appropriate level of economic protectability of enterprise are the indicators of assessment of simultaneous impact and counteracting of the threats from both internal and external environments. According to [11, p. 14], these factors are various and in each branch of industry they have their own specifics, but there are distinguished the general factors that affect the level of economic protectability of enterprise regardless of the forms of ownership and branch of production. These are primarily the factors of production: location of enterprise, natural resources, availability of their use, manufacturing infrastructure with education and qualification level of staff; stable demand for products; reliability of suppliers; external competi-

tiveness concerning products that is exported and must meet international standards and normative parameters of quality; state economic regulation of activities of enterprise; sufficient protection of trade secret and competence of administration of manufacturing structure.

In its turn, if to single out all destabilizing factors they being potential threats to any industrial enterprise are systematic and non-systematic. They arise in the space of internal and external environments and also directly influence the objectivity of the state of economic protectability of business entity (Fig. 1). Since modern enterprise is the main element of general dynamic economic system having the property either to develop or to completely collapse under market conditions that maximally expands the range of diagnosed level of its protectability both in general and according to separate spheres of entrepreneurial activities the problem of simulation of the distribution of fixation of impact of threats from internal and external environments on the current state of economic protectability of enterprise that gives an opportunity with the participation of optimally suggested quantity of parameters-indicators to adequately monitor and when ever possible to consistently neutralize negative consequences of interrelation of components of the environments with the current effective system of ensuring of economic protectability of business entity can not be left without attention.

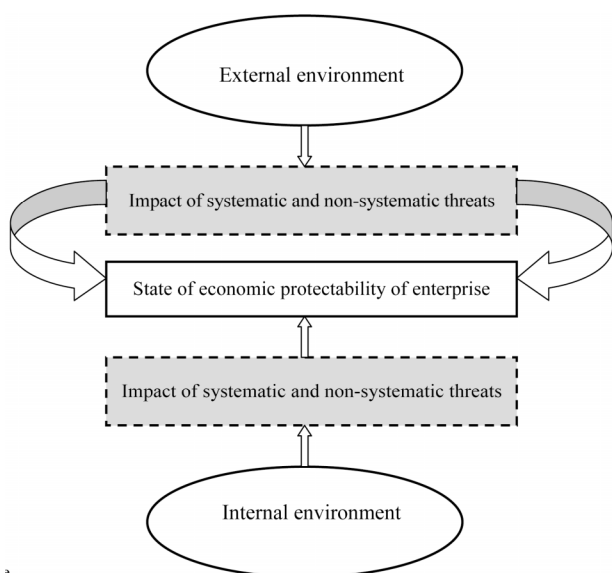


Fig. 1. Generalized impact of systematic and non-systematic threats on economic protectability of enterprise

Note: made by the author

The current consequences of the global financial crisis of the previous years continue to impact the domestic industrial enterprises. In this regard it is worth revising at them not only the state of efficiency of functioning but also the systems of their economic protection. Each manufacturing enterprise can independently form and afterwards correct the individual activities of the control service over the state of its economic protectability. Since every business structure is an open system that has constant and close interrelation with internal and with external environment, it is necessary to periodically assess the impact of threats that arise in the space of these environments on integrated its economic protectability, but it can be done only provided that the relevant information on financial and economic activities of enterprise is open to users.

It is not excluded that this information can be distorted and incomplete that will negatively affect the integrity of objectivity of economic protection. In this situation it is necessary to select a range of financial and economic parameters-indicators so that they would absolutely fix the impact of all even of the minor threats, by the deviations from their normative meanings however keeping previously mentioned specific weight of fixation of destabilizing factors from internal (40 %) and external (60 %) environments.

As for internal environment, it is easier to diagnose its influence and in the future to monitor and direct it at the collective effective management of trend of fluctuation of the level of economic protectability since it directly depends on the dynamics of the internal state of solvency, creditworthiness, competitiveness of enterprise. However a number of properties of enterprise automatically depend on the size of influence of threats from external environment. Since it is impossible now, for example to find products of automotive industry in which all parts and nodes would be made by one or only by few producers. For example, in MG 350(Morris Garages) there are used components of nearly 500 suppliers that makes the control over all external factors not maximally precise [12]. Also the state of economic protectability of automotive industry and machine industry in general all over the world, and particularly in Ukraine can be destabilized by the present “stable stagnation” in the market of sale of finished products that affects primarily such economic indicator as sales proceeds.

For example, in Europe only for October 2012 the number of registered new cars dropped by 4.8 compared to similar period of the year 2011. In addition, for January-October 2012 the decline was 7.3 %, particularly including Ukraine. This trend of decline in number of sales of products of motor industry covered such countries as France – by 7.8 %, Italy – by 12.4 %, Spain – by 21.7 %. However the Great Britain was not affected by it: there was recorded an increase by 12.1 % [12]. Although the dynamics of production of trucks and buses at some domestic machine-building enterprises is not decreasing.

Therefore only by such an effective financial and economic indicator as revenue from the sale of finished products it is difficult to investigate the general state of economic protectability of the industry or individual enterprise. Some trends of the production of trucks and buses at domestic enterprises and dynamics of sale in the market of Ukraine of minibuses and some types of commercial automobiles for January – September 2011–2012 are given in tabl. 1 and tabl. 2.

Table 1

Dynamics of the production of trucks and buses at machine-building enterprises of Ukraine for January – September 2011–2012, pc.

Enterprise	2011	2012	2011	2012
	Trucks		Buses	
PJSC “Zaporizhzhya automobile building plant” (ZAZ)	927	861	131	562
CJSC “AvtoKrAZ”	736	730	–	–
Subsidiary of “AZ “Bohdan” PJSC “Cherkassy bus”	415	689	61	318
CJSC “Boryspilautoplant” (BAZ)	192	100	791	821
PJSC “Cherkassy bus”	15	71	630	441
LLC “Kremenchukcar assembly plant” (KrASZ)	200	100	–	–
PJSC “Chasovoyarskbuses”	–	–	411	187
PrJSC “Chernihivautoplant” (ChAZ)	–	–	373	167
Khersoncar assemblyplant “Anto-Rus”	–	–	83	1
Plant of municipal transport (LAZ)	–	–	92	Information is unavailable
Total	2485	2551	2572	2497

Note: made according to data of Information-analytical group AUTO-Consulting [12].

Table 2

Dynamics of sales in the market of Ukraine of minibuses and commercial automobiles for January – September 2011–2012, pc.

Brand	2011	2012
Sale of minibuses		
GAZ	299	277
Ruta	420	196
Hyundai	162	176
Volkswagen	304	269
UAZ	80	99
Ford	7	14
Toyota	18	12
Chevrolet	1	11
Other brands	88	127
Total	1379	1181
Sale of commercial automobiles		
Fiat	1423	1817
GAZ	1994	1607
Volkswagen	1247	1318
Ford	519	984
ZAZ	508	469
Renault	714	1085
Peugeot	535	787
UAZ	307	252
Bohdan	148	141
Mercedes-Benz	81	164
FAW	37	83
Izh	114	79
Citroen	655	480
Other brands	932	167
Total	9214	9433

Note: made according to sample data of Information-analytical group AUTO-Consulting [12].

Apparently the dynamics of production and sale in Ukraine of some types of minibuses and commercial automobiles are ambiguous. In particular, production of trucks for investigated period 2011-2012 grew by 2.66 %, and the total production of minibuses has a downward trend by 2.92 %. Yet the sales of trucks for the specified period decreased by 13.05 %, similarly to the sale of minibuses, where the decline is 14.36 %. Although the sale of commercial automobiles has not experienced decline yet: their total sales in 2012 compared to the same period of January – September 2011 increased by 2.38 %. That is, according to this data it is impossible to clearly investigate how various threats from internal and external environments affect the state of the economic protectability of the leading domestic enterprises.

Leading positions in the production of passenger cars in Ukraine as of 01.12.2012 are taken by such companies: corporation “Ukravto” (Zaporizhzhya city), subsidiary of “AZ “Bohdan” PJSC “Cherkassy bus” (Cherkassy city), PrJSC “Eurocar” (Solomonovo city), LLC “Kremenchuh car assembly plant” (Kremenchuh city).

By rational choice and optimal structuring of parameters-indicators in the system of diagnostics of economic protectability of enterprise there can be achieved the accurate simulation of the distribution of fixation of impact of threats from internal and external environments on the current state of economic protectability of enterprise parallelly using the method of control of deviations of structural parameters-indicators from the well-defined range of their normative values.

Therefore let us offer structuring of parameters-indicators according to innovative, financial and credit and investment components of

economic protectability of enterprise so that the peculiarity of offered analytical toolkit would lie in the fact that all estimated parameters would be chosen so as to fix strictly relevant specific weight of the consequences of threats that came from internal (40 %) and external environments (60%) with the help of introduced their optimal number [13]. The distribution of parameters-indicators is as follows: innovative protectability – 6:3 (9 parameters-indicators); financial and credit protectability – 9:6 (15 parameters-indicators), investment protectability – 3:17 (20 parameters-indicators) (see table. 3), that will objectively promote target evaluation of the full range of the threats that periodically come to the space of enterprise with advantage, as was shown by studies, in 20% of threats from external environment, the impact of which can be quantitatively diagnosed through the changes of levels of components of economic protectability.

Table 3

The distribution of advantages of fixation of the impact of threats from internal and external environments according to inputted parameters-indicators within the components of the economic protectability of industrial enterprise

№	Parameter-indicator	Advantage of fixation of impact of threats from internal ($\downarrow I$) or external ($\downarrow E$) environments
1	2	3
Innovative protectability		
1	k_{ioff} – coefficient of innovative offer	$\downarrow I$
2	P_{sip}^P – parameter of profitability of sold innovative products by net profit	$\downarrow I$
3	e_u^i – value of useful efficiency from introduction of innovations	$\downarrow I$
4	$k_{\sum C}^{IP}$ – coverage ratio of the total costs of innovation project	$\downarrow I$
5	R – total risk of innovation project	$\downarrow I$
6	l_{ia} – level of inventive activities	$\downarrow E$
7	l_{ia}^{fc} – level of financing and crediting of innovative activities	$\downarrow E$
8	I_{ia}^e – integral parameter of efficiency of innovative activity	$\downarrow I$
9	P_{ipr} – indicator of profitability of innovation project owing to investments	$\downarrow E$
Financial and credit protectability		
1	k_{gl} – coefficient of general liquidity (coverage ratio current)	$\downarrow I$
2	k_{ql} – coefficient of quick liquidity	$\downarrow I$
3	k_{al} – coefficient of absolute liquidity (immediate solvency)	$\downarrow I$
4	$k_{R/P}^{sh}$ – coefficient of ratio of short-term accounts receivable and short-term accounts payable	$\downarrow E$
5	k_a – coefficient of autonomy (financial independence)	$\downarrow I$

1	2	3
6	k_{fs} – coefficient of financial stability	↓ E
7	k_{moc} – coefficient of maneuvering of own capital	↓ I
8	k_{fin} – coefficient of financing	↓ E
9	k_{fd} – coefficient of financial dependence	↓ E
10	k_{eof} – coefficient of ensuring of current assets at the expense by own funds	↓ I
11	k_{dc}^c – coefficient of concentration of debt capital	↓ E
12	k_{rbof} – coefficient of ratio of borrowed and own funds	↓ E
13	P_{oc} – profitability of own capital	↓ I
14	P_a – profitability of total assets by net profit	↓ I
15	P_{P_s} – profitability of sold products by net profit	↓ I
Investment protectability		
1	k_{in}^{pr} – integrated coefficient of probability of preservation of investment attractiveness of enterprise	↓ I
2	k_{fi}^R – coverage ratio of risk from financial and investment activities of enterprise	↓ E
3	$k_{\sum_i}^{fe}(t)$ – coefficient of ratio of financial expenses to total amount of investments received by enterprise for the reporting period	↓ E
4	$k_{P_s}^C$ – coefficient of ratio of obtained credits to the amount of sold products at enterprise	↓ E
5	k_s^{BPA} – coefficient of suitability of state of basic production assets, that do not need immediate additional investments for updating	↓ I
6	k_{inv} – coefficient of investing	↓ E
7	k_{ESF}^{fd} – coefficient of financial dependence on external sources of financing	↓ E
8	k_{s-p}^{li} – coefficient of special-purpose designation of long-term investments with the participation of investments	↓ E
9	k_a – coefficient of autonomy (financial independence) (without control of consideration of ensuring of following expenses and payments at enterprise (because of removal of restrictions on credit risk) and income of future periods with recommended expansion of the upper range of normative values)	↓ I
10	k_{fl} – coefficient of financial leverage	↓ E
11	$I_{pr}(I_{if}^1)$ – profitability index (income per unit of invested funds)	↓ E
12	R_r^{Cinv} – rate of return on capital investments	↓ E
13	R_{ar} – accounting rate of return	↓ E
14	k_{fi}^e – coefficient of effectiveness of financial and investment activities	↓ E
15	k_{RCF} – coefficient of reinvestment of cash flows	↓ E
16	k_P^{CFIA} – coefficient of profitability of the cash flow by investment activities	↓ E
17	$k_{\Delta FI}$ – coefficient of relative rate of change of current financial investments	↓ E
18	$k_{\Delta a}^{\Delta FI}$ – relative rate of change of the coefficient of absolute liquidity with the participation of current financial investments	↓ E
19	k_{FI}^w – specific weight of current financial investments of enterprise in the total amount of investments at the reporting date	↓ E
20	$k_{P_s}^{FI}$ – coefficient of relation of financial investments to volume of sold products for the reporting period	↓ E

Note: made by the author

In other words according to table 3 the total number of parameters-indicators by components of economic protectability that fix the impact of threats from internal environment – 18 and from external environment – 26. This corresponds to specific weight of the consequences of threats that may come from internal (40 %) and external environment (60 %), as noted earlier, with an error not larger than 1 % due to the fact that the coefficient of autonomy (financial independence) (k_a) is used both within financial and credit and investment protectability, although with different upper range of its normative value. In the consequence of the fact that for objective assessment of investment protectability it is possible not to control the future expenses and payments at enterprise thanks to the removal of restrictions on credit risk and incomes of future periods, extending in such a way the upper range of normative value of this parameter-indicator.

Conclusions and perspectives of future researches. Thus, the economic protectability – is an economic category that characterizes the degree of absence of the consequences of threats and overcoming of the impact of destabilizing factors of internal and external environment on economic activities, that is inherent to all structural functioning elements of economic system that are involved in financial and economic and manufacturing activities, where correspondingly the greatest impact on it manifests itself through the change of the quality of main structural properties of enterprise.

It was found that economic protectability of enterprise, being dynamic in time, additionally requires a weighed conceptual approach concerning introduced simulation offixation of impact of threats (by pre-specified specific weight) from the internal and external environments on its current state that is based on optimally inputted number of parameters-indicators in the terms of the recommended components of an integrated economic protection of business entity. This allows us with a maximum precision to control its further dynamics on the basis of accurate information about the range of normative values of proposed parameters-indicators. Perspectives of the further researches in this direction is the specification of some methods of diagnostics of state of economic protectability of industrial enterprise that is the

specification of the system of evaluation measures aimed at determination of magnitude of deviation of the fixed current functional protection of enterprise from the allowed general level of economic protectability.

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