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CONTROLLING EFFECT ON THE ECONOMIC SECURITY OF ENGINEERING ENTERPRISE CONDUCTING FOREIGN ECONOMIC ACTIVITY

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The article deals with interrelation of the enterprise economic security and its financial stability factors, and with problems concerning Ukrainian engineering enterprises financing. It also grounds the direct and multiplicative results on the controlling introduction into the system of the engineering enterprise foreign economic activity management, and it suggests methodic of their quantitative estimation. On the basis of prognosticated calculations made for some Ukrainian enterprises, the authors prove that controlling is able to force engineering enterprise economic security conducting foreign economic activity, through financial factors normalization at the enterprise. There were formed two alternative strategies to spend financial receipts, caused by controlling introduction, there was fixed a connection concerning effectiveness of the strategies use with initial meaning of the enterprise financial factors.

Keywords: *controlling, foreign economic activity, economic security, financial factors, engineering enterprise.*

Problem statement. For engineering enterprise the disadvantages of the foreign economic activity management system may cause not only costs growing through fees, non-productive costs, but also put at risk possibility of economy management at all. Thus, it is important to study foreign economic activity management controlling from the point of view of enterprise economic security.

Analysis of the latest investigations and publications. Problems of the enterprise economic security were investigated by Zaytseva I.Yu. [2], Sak T.V. [4], Stamburg N.V. [6, P.491-496], Dzyuba S.G. and Tkach Yu.V. [1, P.63-71]. Scientists defined factors, which show the level of the economic security, methods and technique of the strategic analysis, presented the main stages of the enterprise economic security strategic analysis. Shkarlet S.M., Bondar V.V., Ivanets V.A. [5…] found out the similarity and diversity of the controlling and enterprise economic security functions.

The possibility to enforce the engineering enterprise economic security, conducting

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foreign economic activity, due to the controlling introduction into management system, is not enough investigated.

Object description. The object of the article is to study the effect of controlling system into engineering enterprise management on its financial and economic situation as a constituent of economic security.

Main material presentation. Nowadays there is no any factor to define the level of the enterprise economic security. However, although the controlling introduction influences initially the own capital size and financial sources structure, we will investigate changes of the following factors under the influence of controlling:

1)   financial index(I_f), calculated as correlation of the borrowed capital size to the own capital size;

2)   financial autonomy (payment-worthiness) index(I_a), calculated as correlation of the own capital size to the whole economic means size.

Authors made an analysis concerning the modern situation of some Ukrainian engineering enterprises payment-worthiness situation in terms of 2 enterprise soundness factors (fig.1), basing on the normative meanings of those factors, recommended by Ministry of Finance of Ukraine [3]: autonomy (payment-worthiness) index has to be more than 0,5, and financial index has to be less than 1,0. Results of the analysis confirmed the problems in financing of most enterprises, their dependence on the borrowed capital that will threaten with payment-worthiness loss and even bankruptcy.

To estimate the effect from the engineering enterprise management system reforming, which conducts foreign economic activity on the bases of controlling, it is necessary to take into account both direct and multiplicative results after such introduction.

Direct result appears owing to the saving of expense, which is possible thanks to the controlling introduction in the enterprise foreign economic activity management. Constituents of the direct result from the authors' points of view are:

1. **cost reduction on salary** thanks to the simplification of the informative streams system in the enterprise, reducing of the document flow, automation of accounts;

2. **minimization of the penal sanctions**, amerced by the state institutions on account of the legislative norms and demands, and set forth by contractors for breach of the agreement conditions, including foreign economic ones;

3. **cost reduction on transportation**, including on the payment for over normative stoppage of the cargo in custom-house, preservation of the cargo on storehouse and terminals, that is possible thanks to the increase of the logistic schemes and prognostication sale and demand systems quality;

4. **saving due to reduction of prices on financial resources**, which appears thanks to the financial streams transparency growing, to the possibility to prognosticate needs in the financial resources, to plan beforehand their expenditure and takings and to choose alternative, more economic financial sources;

5. **cost reduction on the court costs** and connected with them expenses on legal service, expert examinations, business trips and so on, based on the misunderstanding

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avoidance with state establishments and contractors;

6. **increase of the income from production realization** by way of the speed-up and increase of the supply system, logistics, financing quality, increase of the information data relevance concerning external space and demand for production.

Table 1

Information concerning financial situation of some Ukrainian engineering enterprises at year-end 2012
(formed by authors due to[7, 8, 9, 10, 11])

Enterprise	Clean profit, thousand UAH	Own capital, thousand UAH	Borrowed capital, thousand UAH	Financial autonomy (payment-worthiness) index	Financial index	Return on assets,%
PJSC«Novokramatorsky Mashinostroitelny Zavod»	77 231	3 617 667	722 669	0,833	0,200	1,779
PJSC «MOTORSICH»	1 619 469	7 614 479	3 832 065	0,665	0,503	14,149
PJSC«Lugansk locomotive»	38 724	614 095	998 663	0,381	1,626	2,401
PJSC «Sumy pump and energetic engineering plant «Pumpenergeticengineeringplant»	68 587	482 872	590 465	0,450	1,223	6,390
PJSC«Kharkivtractorplant»	0	-167 046	939 024	-0,216	-5,621	0,000
PJSC«FED»	21 363	121 714	221 400	0,355	1,819	6,226
PJSC «Zaporizhia Automobile Plant»	0	-221 355	343 524	-1,812	-1,552	0,000
PJSC«Sumy Frunze Machine-Building Science and Production Association»	238 799	1 107 555	2 912 061	0,276	2,629	5,941
PJSC«Turbogaz»	74 756	115 276	85 466	0,574	0,741	37,240
PrJSC«Kharkov Plantof Transport Machinery»	116	2 838	34 568	0,076	12,180	0,310
PJSC«Kamenets-Podilskavtoahrehat»	-3535	-1 683	328 834	-0,005	-195,386	-1,070

▓ – index meaning doesn't satisfy norms, established by Ministry of Finance of Ukraine

Multiplicative effect appears in the next years of the controlling use, based on the additional resources, sources of which are direct result and such consequences of the direct result: state institutions, banks, contractors' confidence, enterprise image improvement, workers' skills raising, extend of the market outlet, production assortment renewal, including due to the increase of the production quality and research intensity.

The expert survey of workers from some engineering enterprises helped to see that the expected annual size of the direct result from controlling introduction into the enterprise management system is 4,1% from all assets, fixed before the project

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realization with controlling use, experts expect the expenses on controlling system service to be about 1% from the same enterprise assets number. Moreover the mentioned profitability level is correct only on the stage of the controlling system running, we didn't take into account the elaboration period and controlling system mastering within this research.

We should notice that the annual size of the direct result is calculated as the sum of the obviated current costs after controlling introduction and is the constant during all years of the controlling use. It means that controlling system functioning assists enterprise to save some costs each year that is the direct result.

We assume that saved costs (direct result from controlling introduction) will not be divided among enterprise owners; they will be used for economical activity development that causes additional cost takings as multiplicative result and enterprise assets growing during the next years.

For the purpose of the annual multiplicative result numerical estimate from controlling system use, it may be considered profit from investment, which is the direct and multiplicative result of the last years. In other words, multiplicative result is a consequence of the enterprise assets growth, caused by controlling introduction.

It is traditionally to think to invest in such cases when the expected profitability from such costs investment will be higher than interest on deposits, proposed by bank institutions. Percentage rate on deposits in propositions from different banks is fluctuating subject to the deposit terms including period, minimal deposit size, and period of the interest on deposits payment. In many engineering enterprises return on assets exceeds deposit profitability; moreover the enterprise return on assets is growing with increase of its successful activity and economic security. Within this research we have chosen the lowest deposit profitability level that is 14 % per annum.

Taking into consideration of the mentioned above information calculation of the multiplicative result from controlling introduction i-year may be described by the formula:

$$M_i = (A_{i-1} - A_0)r \qquad (1)$$

where M_i – multiplicative i-year result of controlling running, monetary unit;

A_i – number of the enterprise assets at the end of i-year economy, monetary unit;

A_0 – basic number of the enterprise assets, fixed on the beginning of controlling introduction project, monetary unit;

r – investment capital yield rate (we have chosen 0,14).

Size of the annual enterprise assts growth owing to the controlling system running is the consequence and is the sum of annul direct result and multiplicative result of the same year:

$$A_i = A_{i-1} + P + M_i, \qquad (2)$$

where P– annual size of the direct result from controlling introduction, monetary

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unit.

Since the controlling system introduction foresees its long term use, one is not able to disregard inflation effect. In our case the expected cost incomings from the direct and multiplicative result are under influence of the inflation processes, however it is graded owing to the opposite inflation effect on the basic sum of the enterprise assets, that is the ground to calculate direct and multiplicative results from controlling introduction. Thus there is no inflation constituent in the direct and multiplicative results calculations.

The financial problems of the most native engineering enterprises are connected with great size of the borrowed capital, including the long-term capital. The long-term borrowings include mostly bank long-term credits and other long-term financial commitments. The main feature of the long-term borrowed resources is risks, hard conditions of running and providing and thus raised involved cost.

Receiving the additional financial resources by means of the direct and multiplicative results from controlling introduction, the engineering enterprise authority must choose one of the alternative strategies to use financial incomings, created by authors:

1. strategy of «debt repayment» means to direct costs to repay the credit debts. Advantage is given for long-term borrowed costs return. At the same time the own capital is increasing, borrowed capital is decreasing, profit will grow only one time, during the first year of the controlling system running (sum of the direct result), and then it is without any changes till the moment of the debt repayment end. It is possible to choose another strategy after bringing the capital structure into a good condition;

2. strategy of «production development» means to direct costs on the extensive or intensive production extend. Extensive production development foresees saved resources use for additional production quantity. Therefore the own capital and profit are raising, debts are not being changed (based on the controlling introduction results). During the intensive production development costs are oriented on the intensive development of the production, i.e. saved resources are used to investigate new types of production or to increase quality of the existed ones, to introduce progressive technologies and production means. In this case debt is not changed (based on controlling introduction results), at first own capital and profit will be raised slowly, mainly due to the direct result, and then this process will be quicker.

Of course, compromise variants of the saved costs using strategy are possible. They concern the resources distribution in accordance with 2 strategies. Then we will represent the analysis and form the prognostication of the enterprise financial situation change under the controlling effect by 2 mentioned above strategies of the financial incomings use.

According to the first strategy of the received costs from controlling introduction saved costs will be oriented on credit debt repayment, if it exceeds recommended sizes by Ministry of Finance of Ukraine. Since the resources will not be directed on the extensive or intensive production development, there will not be the essential multiplicative result and the whole assets number will not increased.

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After bringing the enterprise equities structure into satisfied condition, i.e.K_a=0,5 та K_f<1, resources will be oriented on the production development, that cause multiplicative result and enterprise profit and assets growth.

According to the second strategy of costs spending which are received from controlling introduction, saved resources are directed into the production development at once, and during the second year of the controlling system running the enterprise can expect multiplicative effect. The main point of the multiplicative result appearance during each next year is the enterprise assets growth owing to the direct and multiplicative results of the previous years. If the enterprise has such assets, which exceed the size of the borrowed capital part to pay it back for financial figures normalization, one-off calculation is made by commitments in the necessary sizes, and then there is production development.

The authors conducted prognosticated calculations of the chosen financial indexes under the influence of controlling for 9 engineering enterprises taking into account 2 strategies of the financial incomings use (table 2).

Table 2

Prognosticated calculations concerning financial indexes changing under controlling effect

Enterprise	Initial factorsvalues		Strategy of "debts payment"		Strategy of "production development"	
	K_a	K_f	Normalization term ofK_a and K_f, years	Assets growing term 1,5 times, years	Normalization term ofK_a and K_f, years	Assets growing term 1,5 times, years
PJSC«Lugansk locomotive»	0,38	1,63	4	14	5	11
PJSC«Sumy pump and energetic engineering plant«Pumpenergeticengineeringplant»	0,45	1,22	2	11	3	10
PJSC«Sumy Frunze Machine-Building Science and Production Association»	0,28	2,63	8	18	7	13
PrJSC«Kharkov Plantof Transport Machinery»	0,08	12,18	14	24	10	14
JSC «Zaporizhye of Heavy Crane-Building Plant»	0,09	10,65	14	23	10	13
JSC «Pluton»	0,44	1,25	2	12	3	11
PJSC«FED»	0,35	1,82	5	15	5	12
PJSC«Turbogaz»	0,57	0,74	0	10	0	10
PJSC«Kamenets-Podilskavtoahrehat»	-0,01	-195,39	17	27	11	15

It is necessary to mention, that profit, own and borrowed capital size will be changing not only by the controlling system effect in practice. Many external and

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internal factors influence the formation of the capital structure; however within this investigation we separate controlling contribution into enterprise profit and capital sizes, and other factors are not taken into account.

Graphic presentation concerning dependence of the initial financial autonomy index level and term of its index normalization and term of the capital growth 1,5 times shows that due to the strategy of «debts payment» normalization processes rate is characterized with more flexibility in relation to the enterprise initial financial state, than due to the strategy of «production development» (fig. 1 and 2).
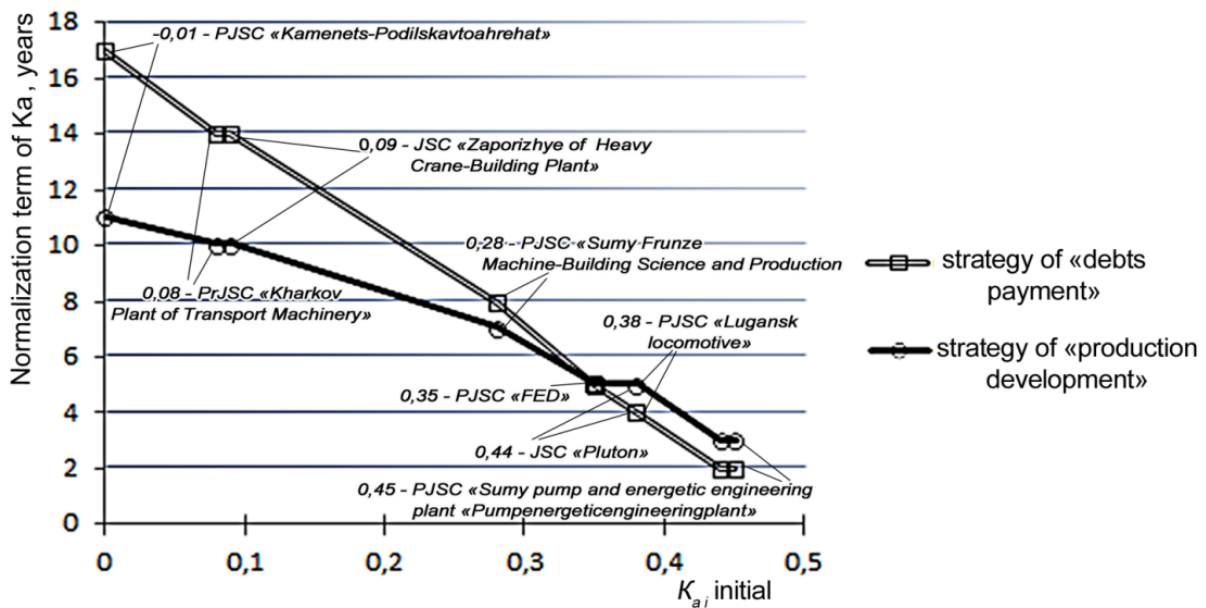

Fig. 1. Dependence of the financial autonomy index normalization term (K_a) under effect of the controlling from its initial value
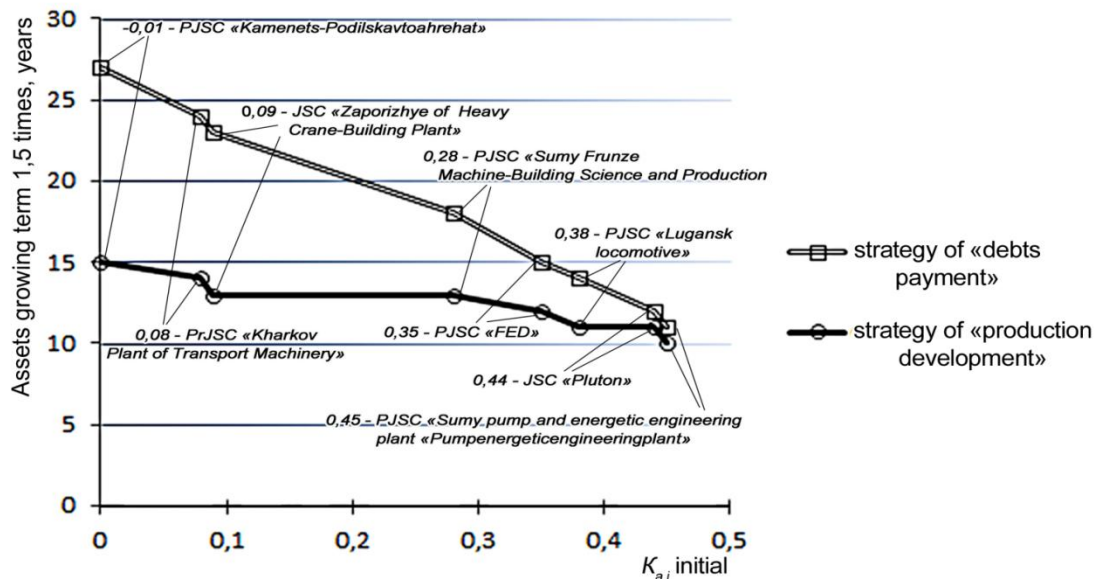

Fig. 2. Dependence of the enterprise assets growth 1,5 times under effect of controlling from the financial autonomy index initial value (K_a)

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The greater enterprise financial state factors deviation from norms, the more effective financial incomings strategy "production development" use will be. Vice versa, some problems in equities structure may be corrected in the same terms due to each strategy.

In the real life terms of the financial condition normalization will differ from the calculated prognostications by author owing to the debt payment and development of not only profit activity, gained as direct and multiplicative result from controlling introduction, but also main part of the annual profit. The authors made the analysis in which they separate controlling contribution into financial state and economic security enforce. Besides, the controlling effects the economy activity profitability and enterprise assets growth and it is faith to expect that additionally invested money (in our case it is direct and multiplicative result from controlling system introduction) will give profit in view of achieved profitability level at the enterprise, more than minimal, that will also promote the normalization process of the firm financial state.

Conclusions. Thus, to use controlling in the enterprise management system may improve the enterprise financial situation through its capital structure normalization, may exceed economy activity profitability and positively effect all assets, that in its turn enforces economic security of the firm. Moreover, enterprises with digressions in the equities structure should use financial incomings for the production development, leaving debts without any changes for some time that will lead to the normalization processes promotion. Prognostications took into consideration only numerical constituent of the multiplicative effect, which was estimated as investment income from the direct result. However, in practice the substantial contribution into the enterprise financial normalization should be expected from the qualitative phenomena of the multiplicative effect.

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