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Economic behavior of machine-building enterprises: Analytic and managerial aspects

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Abstract. The paper considers results of economic behavior of machine-building enterprises of Vinnytsia region by means of formed author approach to mathematical interpretation of economic behavior models of manufacturing enterprises; conceptual aspects of management of machine-building enterprises economic behavior are elaborated.

Key words: economic behavior, rent-seeking behavior, production-oriented behavior, mixed behavior, model of economic behavior, management of economic behavior, machine-building enterprise.

INTRODUCTION

Economic behavior of the enterprises is a complex and multi-sided process, because as previous research has shown, it is a combination of regular actions, that represent the essence and character of economic activity stipulated by the influence of objective and subjective factors for the implementation of the enterprise priority objectives and economic agents groups in conditions of choosing and adaptation to changes. Therefore, the evaluation and management of enterprises economic behavior is essential to identify the combination of impacts on the functioning of an enterprise, determine the trajectory of development and future prospects of the activity.

An important contribution to definition of the essence of enterprises economic behavior was made by such modern scientists, as N. Shybaieva, G. Kaplenko, M. Gurevychov, V. Voitko, A. Azrylyian. However, in the process of economic science development problems of formation and typification of enterprises economic behavior is reflected in the works of a number of Ukrainian and foreign scientists: G. Kaplenko, V. Pastuhova, A. Kudinova, O. Malysh, O. Prutska, I. Ansoff, S. Sologub, G. Kurchieieva, A. Aletdinova, S. Gritcenko, R. Akoffa. However, there is insufficient practical study of enterprises economic behavior, including machine-building, that would reflect the entire totality of accumulated results in the outlined direction.

The aim of present research is identification of trends in the economic behavior of machine-building enterprises and elaboration of conceptual aspects of its management on the basis of the carried-out estimation.

RESULTS AND DISCUSSION

Estimation results of the machine-building enterprises economic behavior according to the approach formed by the author [1] show that there is a sufficiently large number of machine-building enterprises with favoring rent-seeking behavior that do not provide their productive operation, because companies do not fulfill their main purpose and do not use existing production potential (an array of objects of the study is represented by 57 machine-building enterprises of Vinnytsia region). Then, the percent of indicated enterprises amounts to 36,84% (21 enterprises). In its turn, economic behavior of 19 enterprises (33,33%) is characterized as mixed, i.e. combination of productive, financial, investment and favoring rent-seeking activity, and of 17 enterprises (29,83%) – as production oriented. Simultaneously, 14 enterprises of 17 machine-building enterprises with production oriented behavior are industrial, and the rest - 3 enterpries- are engaged in machine-repairing production.

Transformation monitoring of economic behavior models of the studied objects, estimation of their dynamism or stability during 2002-2011, showed a gradual decrease of enterprises with production oriented behavior – from 23 to17 (at 26.09%), a decrease of enterprises with mixed behavior - from 26 to 19 (at 23.08%) and a sharp increase of enterprises with rent-seeking behavior- from 8 to 20 (at 150%). The above-presented dynamics characterizes negative trends in the machine- building enterprises

development, because machine-engineering foundation is lost, namely concentration of enterprises on production processes decreases, let alone their low innovation development. In addition, modification of the production oriented or mixed behavior of an enterprise on the favoring rent-seeking, will probably favor the reorientation of its activities on another sector of national economy.

However, the estimation of machine-building enterprises economic behavior of Vinnytsia region in dynamics during 2002-2011 showed both the existence of changes, and their absence. Naturally, this is a result of certain strategy or management policy of economic behavior of the separate enterprise (except for the impact of unpredictable events).

Taking into account the complexity and the integrity of general financial result (financial result from ordinary activity to taxation), maximization of which is one of the main criteria successful operation of many enterprises, research of economic behavior management under the influence of the given factor was carried out [2].

Changes monitoring in enterprises economic behavior testified that out of 57 machine-building enterprises under study, 30 enterprises (52,63%) were really reoriented on the other model of economic behavior (Fig. 3). Among the above-mentioned enterprises, for three the dynamics of financial result is not an explanation of the obtained changes in economic behavior, however income increasing must not favor to enterprise transition to rent-seeking behavior from production oriented or mixed behavior and to mixed model from production oriented. Probably , in the given case there exists another criterion for economic behavior management

Investigation of the remaining 27 enterprises (47,36%) reflects completely understandable change of economic behavior under the influence of determined dynamics of financial results. Then, income increasing ensured the possibility for enterprises to reorient the development from mixed behavior model to production oriented one (5 enterprises) and favoring rent-seeking to production oriented (1 enterprise). Simultaneously, decreasing of financial result favor the behavior change of 8 enterprises from production to mixed, 5 enterprises – from production oriented to favoring rent-seeking and 8 enterprises from mixed to favoring rent-seeking. The above-mentioned gives a possibility to state that outlined transformation of production oriented behavior to mixed is really conventionally positive, that is the consequences of profit decreasing and necessity to develop other kinds of activity.

Taking into consideration the carried out research it is obvious that financial result is not always (in this case is only in 47,36%) a criterion of management of enterprise economic behavior. In particular, on other enterprises during any changes of the profit (decreasing, increasing, absence) model of economic behavior is unchangeable. Then, management of economic behavior of an enterprise stipulates consideration and optimal combination of all influence determinants on economic behavior of enterprises, showed in [3].

Generally, management of enterprises economic behavior means purposeful influence on functional activity of separate subsystems of an enterprise, in the side of higher level of management, in the network of corresponding hierarchical system of power division. Thus, key issues in suggested definition are : influence purposeful-

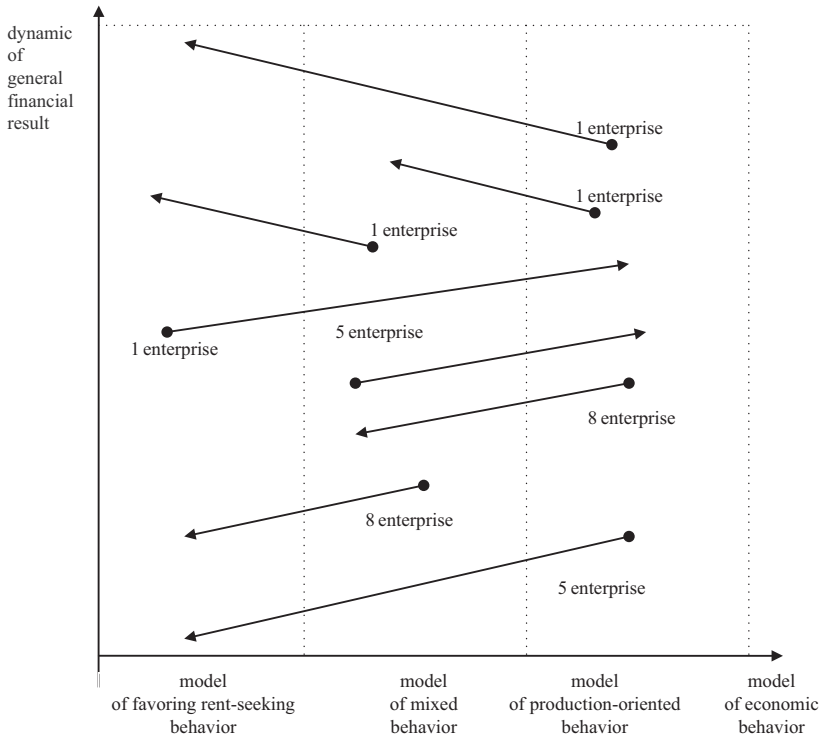

Fig. 1. Enterprises economic behavior management of enterprises – objects of the research from dynamics of financial results position (*the own research of the authors)*

ness (i.e. existence of clearly defined and substantiated many-sided aims); existence of functions as criterial, estimation indicators of enterprise state and management aim, consequently, peculiarity of managerial task set-up, consisting in management hierarchy recognition and division of the power on the enterprise level.

Such influence logically must have the aim of the change of the existing at the present moment state of the enterprise taking into account that such state by certain criteria has been recognized as insufficiently effective, and enterprise transfer to the other –more efficient –state. As it was mentioned before, conceptually different sate of the enterprise is stipulated by different models and economic behavior types, that in the summary will be realized in that or in other state of enterprise efficiency. Recognition (formalization, quantitative identification) of the most effective state is based on the idea of so called state of "ideal enterprise" (in author's interpretation of that definition). Parameters of ideal state are associated by the author with the content and qualitative expression of definite list of enterprise functions in the aggregate of many-sided quantitative factors of social and economic essence, that reflects the most effective enterprise state.

Hypothesis of the research was based on that the aim of approaching to the state (parameters, factors) of such ideal enterprise defines the vector and the content of managerial influence, whereas the latter is associated with change of parameter and factors of enterprise functioning; consequently, efficiency of economic behavior management is related with correlation between the efforts aimed at the change of enterprise state, and comparison of the latter with expected (set) state of an enterprise and its ideal parameters.

To solve the set task we will set the following conditions (graphically analogous interpretation is shown in Fig. 2):

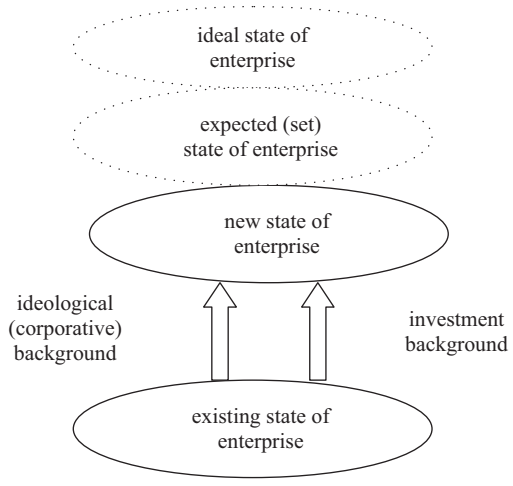

Fig. 2. Conceptual interpretation of the task of management of economic behavior of a representative enterprise (*own research of the authors)*

1) The statement of unsatisfactory state of separate enterprise and definition on this basis of the aim of changes. A separate enterprise is examined, the state of which is recognized as unsatisfactory or as one that requires change. According to aggregate results of our research concerning 57 machine-building enterprises of Vinnytsia region we assume , that such enterprise belongs to the model of rent-seeking behavior.

2) The statement of corporative ideology change. Necessary condition of task solving, as we suppose, is the presence of the fact of corporative owner change (the group of owners), which initiates managerial changes, the aim of which is (taking into consideration that specified groups of enterprises by behavior models) – for instance, to regenerate (to start) production functions, which means modification of enterprise behavior model; proceeding from the fact that the present aim has strategic character and all changes on the enterprise are subordinated to this aim.

3) Initiation of effective investment process. It means, that to realize the indicated strategy certain (limited) resources – financial, information, technologic etc. have been allocated; at the same time the task is set to achieve the most effective usage of investments according to the strategic determined aim – change of enterprise behavior. Hence, alternatives regarding the volume and structures usage of such resources are possible, that validate the problem of their optimal division.

It is necessary to analytically and mathematically determine the model of managerial process, its influence on the initial, expected and obtained parameters of an enterprise.

The solution of the outlined task of economic behavior enterprise management is accomplished according to the following algorithm [4–8]:

1) Adequate estimation of the initial state of an enterprise. It stipulates the state determination of enterprise function and, correspondingly, quantitative reflected parameters of the enterprise at the present moment.

2) Ideal state determination and desirable (set) state of an enterprise (aim of changes). It stipulates functions and parameters determination of an enterprise after realization of the corresponding strategy of changes, generalized in a new model of enterprise behavior; it requires also determination of ideologically acceptable state, really achieved as a result of changes (so-called. "minimum of economically justified positive changes"), where we assume the condition that the really achieved state will (may) differ from the ideal and set states.

3) Grounding of the ideology and managerial influence in the limits determined on the corporative level program of changes (conceptions of changes and their cost).

The definition of the concept of changes by priority of objectives and – accordingly agreed – optimum variant of the structure of resources expenditures within the total volume of allocated resources for the implementation of the investment process in general. Thus, this definition will be heterogeneous (in some cases - fuzzy) criteria and indices - from quantitative (e.g., cost) to qualitatively interpreted (e.g., product quality, personnel, etc.) – definition of the tree of sets.

4) Definition of organizational changes within the same management system at the enterprise (mechanism of changes). It provides definition of organizational changes of management content, interpretation of which must be made by the totality of relevant evaluative criteria of management system perfection.

We assumed, that it is necessary to extend the content revelation of the determined stages. Thus, during the analysis of the essence of modern enterprise, conceptual estimation of the present and optimized state, we will follow the functional approach, revealed by G. Kleyner [9–14]. Correspondingly, any enterprise is examined via the prism of universal set of differently meaningful functions. Thus, practically each enterprise carries out poly-functional and different subject activity, providing relations with wide range of economic agents and their institutional groups. In the context of the outlined approach, the author suggested his own variant of the list of such functions (Fig. 3) and correspondingly interpretation of functions.

Further, the question arises how these features are implemented at present in the investigated companies, as well as what state of the following functions is set as desired (expected). Quantitative estimates can be obtained as a result of the expert survey, that was conducted by the author of this work on firms - objects of the research. The author believes that it is expedient to introduce 6 – point scale with the following values ("0 – complete lack of function" (in some cases, it takes place), "1 – very low", "2 – low", "3 – average", "4 – high", "5 – very high"). Such linguistic interpretations can certainly have quantitative values that require additional relevant studies. We also think that we should not take into account the differences in importance of these functions primarily based on the fact that in different conditions (different management tasks) priorities and goals, respectively, the functions may vary, which complicates interpretation of the evaluation process. However, this issue deserves separate study in the given aspect. Estimates of the functions in each case will differ objectively, which seems logical, proceeding from the unique situation in each company. Meanwhile, the results of the authors' research show that, there is a clear relationship between the state (estimates) of functions and models of economic behavior of enterprises. Table. 1 shows the results of the evaluation of functions on the example of enterprises – objects of study. Ideal enterprise is characterized by the highest estimates regarding all functions without any exceptions.

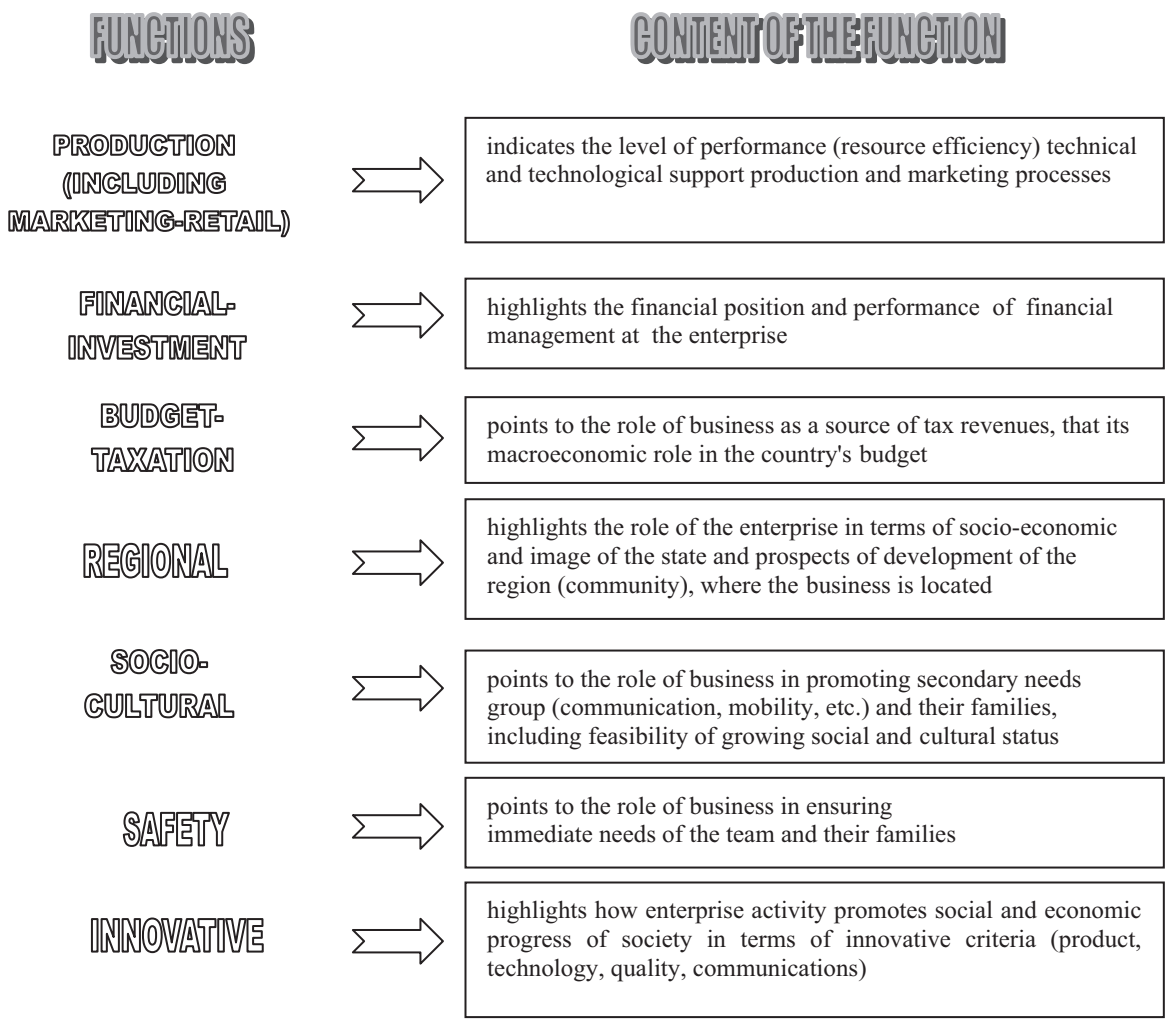

Fig. 3. Determined functions of the modern enterprise (*the authors interpretation [4]*)

Table 1. Evaluation of functions of machine-building enterprises of different models of economic behavior

Functions	Enterprises with rent-seeking behavior*	Enterprises with production-oriented behavior**	Enterprises with mixed behavior***
Production (including marketing-retail)	0,03	2,75	2,10
Financial-investment	2,70	3,50	3,70
Budget-taxation	2,30	2,85	2,90
Regional	1,80	3,90	3,75
Socio-cultural	1,05	3,50	3,20
Safety	0,04	3,10	2,80
Innovative	0,03	3,15	3,00
Total	7,95	22,75	21,45

* – on the example of LRC "Vinnitsa Aggregate Plant", JSC "Kalinowski Mechanical Repair Plant", JSC "Mogilev-Podolsky Instrument-Making Plant", JSC "Terminal" (average of the enterprises);

** – on the example of Train Shed Jmerinka SIP JSC "Vinnitsa Pilot Plant", JSC "Bratslav", JSC "Avtoelektroaparatura" (the average of the enterprises);

*** – on the example of PJSC "Hmilnyksilmash", JSC "Zhmerinsky Business District" Agromash","PAT "Yampolsky Instrument-Making Plant", LLC "Zhmerinsky venture" express"" (average of the enterprises*), (results of authors research based on expert assessments of these enterprises – research objects)*

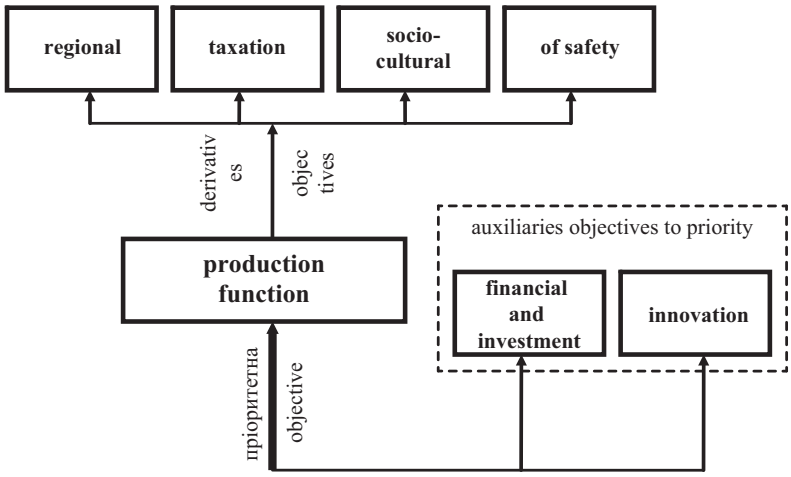

Fig. 4. «Tree of priorities and tasks» of the representational machine engineering enterprise (*the own research of the authors and interpretation [4])*

It goes without saying that each specific managerial project (if a realistic one) may not be targeted at achievement of the maximum values of all the functions at the same time. The ideal state may be considered as the long time perspective, actual for all real acting subjects [15–19]. Therefore, in each specific case it is necessary to consider the strict definition of the tree of "tasks and appropriate criteria", which means the realization of the next step in the solution of the task.

Considering the specifics of the machine engineering enterprises, which means the priority of the manufacturing functions and the necessary increase in manufacturing capital as well as in optimal use of manufacturing potential, we assume that the corresponding tree of "tasks and appropriate criteria" for this case is presented in Fig. 4. There is the strict incline to the change in some specific functions as the main (head) vector of the change processes, and the change of the other takes place indirectly.

It should be noted that the hierarchy of the priorities and tasks logically proceeds from the presentation of the contemporary representational enterprise following the system and international theory, presented in [20]. This approach singles out 2 components of an enterprise: the institutional bases and functional factors of an enterprise. The change in the institutional base of an enterprise then may take place in a long term period, but the functional factors, as the derivatives, are the relatively variable factors. It is expedient to consider that the manufacturing functionality of an enterprise and its external market activity interact via control system as well as decision support mechanisms at the enterprise.

Proceeding from this the strategy of controlling over the economic behavior of en enterprise may be developing following the two extremely alternative ways:

1. Minimalist [4] or (fragmental) approach. It stipulates for the orientation to the change in behavior of an

enterprise due to its "upper" layers, that is, to the resulting social and economic factors.

2. Institutionally agreed approach. It stipulates for the formation of the managerial influence considering all the layers of an enterprise, that is, the achievement of the resulting economic factors – as the stable tendency – may be received at the cost of the specific changes in all the layers.

CONCLUSIONS

Evaluations of economic behavior of machine–building enterprises show sufficiently large number of firms favoring rent-seeking behavior, that probably do not ensure their productive performance, because companies do not fulfill their main purpose and do not use existing production capacity.

Management of economic behavior of the company is organically built on the basis of transformation of the institutional environment of representative enterprise, which is found in the following activities: the formation of ideology of corporate level changes, i.e. taking into account the interests of all groups of economic agents of enterprises, creation of the system of strategic planning in the context of this transformation based on the corresponding set of enterprise functions and vector of changes of all its components as a basis for modifying the behavior of enterprises, ensuring an efficient investment process of changes and system of distribution of economic power in the company.

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