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FORECASTING AS DECISION-MAKING TECHNIQUE FOR ENTERPRISE DEVELOPMENT IN CONTEMPORARY ECONOMY

PROGNOZOWANIE JAKO METODA PODEJMOWANIA DECYZJI DOTYCZACYCH ROZWOJU PRZEDSIĘBIORCZOŚCI W NOWOCZESNYCH WARUNKACH GOSPODAROWANIA

Abstract: The overview of methods for the forecasting of financial condition of an enterprise, working with economic models, is offered in the article. The most widespread economic models, forecast methods are analyzed, their advantages and disadvantages are described. The necessity of the use of multifactor regression model as the most informative base of initial data to analyze enterprise financial condition is proven.

Keywords: financial analysis, forecasting, enterprise financial condition, business, dynamic processes, regression analysis

Streszczenie: W artykule dokonano przeglądu metod prognozowania kondycji finansowej firmy z wykorzystaniem modeli ekonomicznych. Przeanalizowano najbardziej typowe modele ekonomiczne i metody prognozowania, biorąc pod uwagę ich zalety i wady. Wskazano na konieczność stosowania do analizy kondycji finansowej firmy w modelu regresji wieloczynnikowej podstawowych danych informacyjnych.

Slowa kluczowe: analiza finansowa, prognozowanie, sytuacja finansowa firmy, gospodarka, dynamiczne procesy, analiza regresji

Introduction

Commercial activities of enterprises in market economy conditions largely depend on how their managers are likely to foresee far and near development prospect, i.e. on the forecasting. Forecasting plays a special role in the ensuring of enterprise sustainability, because it is associated with the formation, placement and use of resources, obtaining of return on invested capital, determination of alternative ways of the development to prevent economic risks in time. Forecasting is rather powerful tool for doing business. The need for forecasting is caused by the fact that it is carried out continuously with the arrival of new information and gives sound estimates of the ways of managed object development.

The determination of forecasting bases and its theoretical nature are revealed by a large number of scientists. Thus, an important role in theoretical developing of forecasting issues is played, in particular, by such scientists as I.V. Bestuzhev, M.P. Lukashevych, S.V. Mochernyy, A.M. Stelmaschuk, O.S. Ivanilov, H.O. Shvydanenko, V. Ye. Maskalyuk. However, in practice, in rapidly changing market situations the process of forecasting isn't paid enough attention from enterprise managers, that adversely affects final results of their activities.

The article aims to study forecasting nature and its role in enterprise activities, as well as its relationship with decision-making techniques in contemporary economy.

1. Forecasting as the process of forecast development

Unlike planning, forecasting is aimed mainly at the future and, as a part of planning, substantially differs from the last. Forecasting is a system of quantitative and qualitative research, aimed at ascertaining of trends of the object development and the search for optimal ways to achieve the objectives of this development. A forecast (from the Greek – prognosis – prediction) is a probabilistic judgment about the state of any object or phenomenon in the future with relatively high degree of reliability made on special research. Forecasting is used at previous (pre-planned) development stage and contributes to for-

mation of the concept of economic development of an object or phenomenon for the planned period. It also plays a certain role at the stage of plan realization, in assessing attained results for the search of possibilities and directions of additional administrative influences, intended to eliminate deviations from development trajectory outlined by the plan[1]. At the same time forecasting is often regarded as scientific detection of possible ways and results of the development of socio-economic advantages and processes based on the analysis of trends.

The purpose of forecasting can be formulated in the following provisions:

– the determination of possible directions of social development and economic resources which provide their achievement;

– the determination of the most probable and economically grounded variants of long-term and current plans;

– the acquisition of scientifically grounded variants of trends of the development of quality coefficients, cost elements and other indices that are used to develop long-term plans;

– the substantiation of directions of economic, technical and social policies;

– the predicting of the consequences of decisions and measures used and performed now.

Forecasting, planning of enterprise profit is necessary for drawing prospective and current financial plans[2].

According to O.S Ivanilov, a forecast is a scientifically grounded hypothesis as to likely future condition of economic system and economic objects and parameters which characterize this condition. The development, working out of forecasts is called forecasting[3]. It is widely used at early stages of plans and programs development as a tool for scientific forecasting, variant analysis, obtaining more information on decision-making.

The forecast describes the scope and possibilities within which realistic goals and objectives can be formulated, establishes problems which must become the object of development in a plan. Forecast development and stock of orders formation in market conditions are interrelated specific stages within the framework of overall planning within an enterprise. Differences between them lie in the fact that the formed stock of orders represents and embodies already made decision, and the forecast is a search of potential, realistic, economically correct decision. The formed stock of orders at an enterprise is considered to be the result of all types and stages of work, it has to be qualitatively similar and aimed at reaching the goal. The forecast reveals the possibility of different development options, analyzes and substantiates them. In the forecast it is possible to consider various principles of economic policy and the combination of objective and subjective, economic and non-economic factors. It does not set any specific targets of the plan, but contains material which is required for their development. Economic forecasts can be

[1] O.O. Drobysheva, Yu.V. Kernychyshyn, *Forecasting of industrial enterprise development in modern conditions* [*Prognozuvannya rozvytku promyslovogo pidpryyemstva v suchasnyh umovah*], p. 160, available at: http://www.zgia.zp.ua/gazeta/evzdia_5_158.pdf

[2] G.M. Dobrov, *Forecasting of science and technology*, 4th ed. [*Prognozirovaniye nauki i tehniki,* 4-e izd.], Nauka, Moscow 2014.

[3] Ibidem.

short-term (up to 3 years), medium-term (5-7 years), long-term (over 10 years). For all this the organization of activities as to forecasting requires providing of necessary counter flows of information[4].

2. Influence of econometric models used in forecasting for administrative decision-making

The process of forecasting which is based on mathematical and statistical methods, comprises two stages. At the first stage the generalization of data observed for a long period is carried out and mathematical and statistical model is built. At the second stage, based on statistical patterns and using the built mathematical and statistical model, the value of forecasted factor is determined, optimal trend of the development is chosen and the decision from the standpoint of its consequences in the forecasted period is evaluated.

The prognostics is a subject of economic forecasting. It is the field of knowledge which contains methods for making out and determination of forecasts. Forecasting methods are classified according to various criteria. Various quantitative and qualitative methods are mostly used. For forecasting interviews with experts and creative methods of ideas generation are also used[5].

According to G.O. Shvydanenko, economic forecasting covers three main spheres, that is: the dynamics of resources – natural, demographic ones, national wealth, the development of scientific and technological progress; general economic dynamics – rates and factors of growth, structural changes, specific sectors development; social needs – personal, industrial ones. Nationwide typical sequence of actions in forecasting includes: the statement of forecasting objective; the analysis of forecasting object; the choice of forecasting method; forecast development; the analysis of results obtained in forecast developing[6].

The issue of forecasting won't be investigated in full without the analysis of the impact of econometric models used in forecasting for decision-making. Econometric models enable to discover the peculiarities of economic object functioning and on this basis to forecast its future behaviour in the case of any parameters change[7].

The classification according to the direction and the complexity of causal links between indicators of economic system is one of the major classification factors of econometric models. If using the term "variable", in any sufficiently complex economic system it is possible to select internal or endogenous variables (such as the output, the number of employees, labour productivity) and external or exogenous ones (for example, resources supply, climatic conditions, etc.)[8].

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[4] O.O. Drobysheva, Yu.V. Kernychyshyn, *Forecasting of industrial enterprise development…*, p. 481,
[5] Ibidem, p. 482.
[6] L.O. Levchenko, D.S. Byelova, *Review of methods for forecasting of enterprise financial condition on the basis of econometric models* [*Oglyad metodiv prognozuvannya finansovogo stanu pidpryyemstva na osnovi ekonometrychnyh modelej*], p. 160, available at: http://www.zgia.zp.ua/gazeta/evzdia_5_158.pdf
[7] A.S. Minzov, *Econometrics*, 2nd ed. [*Ekonometrika,* 2-ye izd.], Izd-vo MFA, Moscow 2013.
[8] Ibidem.

Exogenous variables are those which are external to the model, that is, known in advance, and endogenous variables are obtained by calculations[9]. Then according to the direction and the complexity of relationships between internal and external variables econometric models are distinguished. Types of models:

- Systems of interrelated models;
- Recursive systems;
- Time series models;
- Regression models.

3. Forecasting methods

Methods, often used for forecasting with the help of time series models and multivariable regression model, will be considered later. Dynamic processes taking place in economic systems are often manifested as a series of successively located in chronologic order values of that or other indicator which reflects in its change the course of the development of economic phenomenon being studied. These values can be used to substantiate various models of socio-economic systems[10].

Dynamics series are:

- discrete when the registration is carried out through certain intervals of time;
- continuous when the recording of changes of a process or event is carried out continuously.

In economic studies discrete series are used. Digital indicator values, called the levels of these series, and moments or intervals of time, which include these levels, are constituent elements of dynamics series.

At the selection of initial data to create dynamics series the following conditions must be fulfilled:

- all data should be compared, i.e. for interval series levels must answer the same time intervals, and for torque series – certain dates;
- there must be dimensional homogeneity of data;
- it is necessary to remove all random deviations caused by object reorganization, the change of administrative borders, specializations, etc.[11].

Methods of short-term forecasting include the method of moving average and exponential smoothing method. The peculiarity of these methods is that for time series smoothing at the first stage only few of its first levels, that create smoothing interval t, are used. For these levels a polynomial is chosen the degree of which should be less than the number of levels m, which create smoothing interval. With the help of the polynomial new, equalized values of levels are determined for class mark of smoothing. Further smoothing

[9] V.Ye. Moskalyuk (ed.), *Planning of enterprise's activities*, 2nd ed. [*Planuvannya diyal`nosti pidpryyemstva*, 2-ge vyd.], KNEU, Kyiv 2013.
[10] A.S. Minzov, *Econometrics…*
[11] Ibidem.

interval is moved on one level of series to the right, the next value is determined, etc. In any case the forecast accuracy clearly depends on correct choice of forecasting method[12]. However, this does not mean that in every case only one model is used. It is possible that in some cases several different models will give relatively reliable estimates. A trend or line of the main trend in series change is the key element in any model of forecasting. In most models it is assumed that the trend is linear, but this assumption is not always logical and can negatively influence on the forecast accuracy. Extrapolation methods are the most popular and developed among all methods of economic forecasting.

Expert methods are based on the knowledge and experience of professionals of different skills. These methods are based on five main conditions of group decisions[13]:

- Condition 1. Versatility, that is a sufficient variety of possibilities for the choice of experts and possibilities of determination for them of individual types of preferences.
- Condition 2. Positive connection of collective and individual preferences for which the refusal (or addition) from one alternative in individual preferences of certain expert should not change the orientation of the preference in relation to collective one.
- Condition 3. Independence of unrelated alternatives (if preferences of every expert are the same in some profiles, then degrees of society preferences, appropriate according to alternatives, should be the same for these profiles).
- Condition 4. Independence of experts, i.e. the lack of preferences degree «forced» on them by the society.
- Condition 5. Lack of dictatorship (usually by one expert-leader, whose preferences determine the preferences of the society, and other members influence on the choice of alternatives only if these alternatives have no value for the named individual)[14].

Delphi technique, which for more than 40 years history acquired different interpretations and applications, including for the development of forecasts, is the most common expert method.

Conclusions

Having investigated and considered the issue of decision-making techniques in forecasting of enterprise development it is desirable to appeal to the statement of Z.E. Shershneva, namely: «The world of business is too complex to be adequately described within any model».

This conclusion leads to two types of equally false reactions:

1) renunciation of analytical models and analysis in general, exaggerating the value of intuition, experience and «common sense». This reaction is based on the methods of analogies and comparisons, on the study of a series of typical situations, on such thoughts

[12] Ibidem.
[13] G.O. Shvydanenko, V.G. Vasyl`kov, N. Goncharova et al., *Enterprise economy* [*Ekonomika pidpryyemstva*], KNEU, Kyiv 2014, p. 122.
[14] Ibidem, p. 123.

and judgments that prevail at the moment. But all this is also a class of models, but models of a particular type, which actually extrapolate one's own or someone else's expertise to achieve the desired result, which, by general estimation, is unattainable;

2) building of a complex system of interconnected models, covering the largest period of complex reality. Models in this situation seem to make possible rapid and accurate identification of situations, the calculation of individual object behaviour in the conditions of changing environment and associated risks. Such models, orientated on purely formal factors for decision-making, have proven to be wrong, as they need considerable amount of time and, therefore, money. Because of a large amount of information needed for the application of models, in case of probabilistic nature of obtained results, managers refused to use these models, referring to «vainly lost time for information collecting and processing that results in the delay with the adoption of necessary decisions» and «failure to provide a guaranteed 100% success».

Today, most authors agree that only a combination of methods can give more or less reliable forecasting of future development of macro and microsystems.

Furthermore, it should be highlighted that, in our opinion, the following definition of the forecast by O.S. Ivanilov is the most accurate: the forecast is a scientifically proven hypothesis as to likely future condition of economic system and economic objects and parameters which characterize this condition.

From the methods we still distinguish extrapolation methods which are among the most widespread and developed among all methods of economic forecasting.

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