

Onyshchenko S.V., DSc, Professor  
 Glushko A.D., PhD, Associate Professor  
*Poltava National Technical Yuri Kondratyuk University*  
*Poltava, Ukraine*

## **ADITIVE DETERMINISTIC MODELS OF ENTERPRISES ACTIVITY FINANCIAL RESULTS FACTOR ANALYSIS**

In terms of rivalry strengthening at both domestic and external markets, the issue of increase in activity efficiency becomes even more actual for business entities. Results of enterprises activity as well as results of financial and analytical research condition can lawfully be defined as the basis of making effective managerial decisions. In this respect the necessity of studying possibilities of applying factor analysis for identifying reserves of increasing economic effectiveness is undeniable.

Factor analysis occupies a particular place in economic systems management as far as it enables creating and modifying control object parameters by appropriate selection and adjustment of factors determining them. The basis of factor analysis is creating a factor model in which factors should have causal relationships with the investigated indicator. Factor analysis can be both direct in case the analysis is divided into constituent parts, and reverse when divergence balance is made up and at the generalization stage all discovered factors of factual index from the basic one are summed up due to certain factors. According to the nature of causal relationships between the variables, factor models are relatively divided into probabilistic and deterministic [1].

The basis of probabilistic models is made by assertion about stochastic (correlation or regression) connection between the magnitude of the dependent variable and the factors that determine it. That is, along with the main decisive factors, secondary and occasional reasons that determine variation of the resultant trait in space and time are also considered.

Deterministic models are based on the assertion that variation of the resultant feature is functionally determined by action of several non-random factors. This means that under known values of factors the value of a dependent variable is determined explicitly, with a probability of 1. Although the hypothesis is not entirely correspondent to economic reality, it enables constructing deterministic factor analysis models based at only two observations, since functional relationships become apparent in each individual case, for each object of the study. That is why the mentioned models have become widespread as the main tool of factor financial and economic analysis [2]. The following four types, which are characterized by mathematical form of relation between variables, namely additive, multiplicative, multiple, and mixed ones, are most commonly used among the deterministic models.

Algorithm of conducting deterministic factor analysis is the following:

1. Creating an economically grounded deterministic factor model.
2. Choosing an optimal method for factor analysis.
3. Implementation of computational procedures.
4. Making conclusions and proposals on the analysis results [1].

While conducting a factor analysis of enterprises financial results, additive deterministic models are often used, in case the resultant characteristic  $Y$  is considered as the sum of several factors:

$$Y = \sum_{j=1}^m X_j = X_1 + X_2 + \dots + X_m \quad (1)$$

It is possible to study the impact of factors on enterprise activity financial result (net profit) with the help of the following additive deterministic model [3]:

$$Y_{\text{чп}} = X_1 - X_2 - X_3 - X_4 - X_5 + X_6 - X_7 - X_8 \quad (2)$$

where  $X_1$  is net profit from sales of goods (products, works and services);

- X<sub>2</sub> – cost of goods sold (products, works and services) ;
- X<sub>3</sub> – administrative expenses;
- X<sub>4</sub> – selling expenses;
- X<sub>5</sub> – other operating expenses;
- X<sub>6</sub> – other financial income;
- X<sub>7</sub> – financial expenses;
- X<sub>8</sub> – income tax.

One of the most important stages while carrying out factor analysis of activity financial results is defining the value of individual factors influence on performance indicator. When applying deterministic factor analysis for this purpose, the following methods are used: chain substitutions, absolute and relative differences, index, logarithmic, integral, method of proportional division, and others. The first four methods are based on the principle of elimination that is exclusion of all factors influence on the effective indicator magnitude, but one. Choosing one of the deterministic factor analysis methods, it is necessary to carefully monitor all advantages and disadvantages of its applying, which will enable conducting qualitative and effective analysis spending less time [3].

Since the increment of additive models effective feature consists of respective factors increments, the balance ratio of the total increase in the enterprise financial results indicator and the defined factors will be as follows:

$$\Delta Y_{\text{qп}} = \Delta X_1 - \Delta X_2 - \Delta X_3 - \Delta X_4 - \Delta X_5 + \Delta X_6 - \Delta X_7 - \Delta X_8 \quad (3)$$

Thus, factor analysis in the process of assessing the enterprises financial performance is intended to establish causal relationships between the main indicative indices that create preconditions for the entity effective functioning. Changes in such indicative indices as net profit should be systematically analyzed in order to timely respond to changes in key parameters. The use of the presented additive deterministic model while conducting net profit factor analysis gives a general idea of change in its level and change of factors affecting it. However, to carry out more detailed study of this indicator changes, it is purposeful to use other models, first of all multiplicative ones, which will enable calculating reserves of enterprises financial results growth.

### References

1. Nesterova S. V. Metodolohichni osnovy faktornoho analizu u protsesi otsinky finansovoho stanu pidpriemstva [Electronic source] / S.V. Nesterova, Ye.Iu. Delehan – Access mode : [http://www.nbu.gov.ua/old\\_jrn/natural/Nvuu/Ekon/2010\\_29\\_1/statti/52.htm](http://www.nbu.gov.ua/old_jrn/natural/Nvuu/Ekon/2010_29_1/statti/52.htm).
2. Chernyshova O.B. Teoretychni zasady faktornoho analizu prybutku pidpriemstva na bazi determinovanykh modelei / O.B. Chernyshova, V.O. Yankovyi // Ekonomika kharchovoi promyslovosti.– 2015. – № 2 (26). – p. 52-60
3. Kostetskyi Ya.I. Prybutok yak osnovne dzherelo stabilnosti rozvytku silskohospodarskykh pidpriemstv / Ya.I. Kostetskyi // Ekonomichniy analiz: zb. nauk. prats / Ternopilskyi natsionalnyi ekonomichnyi universytet; redkol. V.A. Derii (holov. red.) ta in. – Ternopil: Vydavnycho-polihrafichnyi tsentr Ternopilskoho natsionalnoho ekonomichnoho universytetu «Ekonomichna dumka»,2015. – Volume 19. – № 2. – p. 85-90.
4. Koshelok H.V. Faktornyi analiz rentabelnosti vlasnoho kapitalu pidpriemstva [Electronic source] / Koshelok H.V. Faktornyi analiz rentabelnosti vlasnoho kapitalu pidpriemstva. – 2016. – № 7. – p. 361-368.