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FINANCIAL ANALYSIS TOOLS IMPROVEMENT USING THE INTEGRATED ASSESSMENT METHODOLOGY

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Since the results of the analysis using traditional methods are dozens and even hundreds of indicators, and the complexity of production and economic activity doesn't allow to identify from all output summarizing indicators any as the key one, then the problem of traditional methods of analysis improvement is reduced largely to the determination of the integrated assessment of economic activity. Therefore, the application of integrated assessment is due to the necessity of aggregation of a large number of financial and economic activities indicators in order to determine one of them synthesizing in itself all the sides of the activity of this economic object. Integrated assessment in this case represents the characteristics obtained as a result of the simultaneous and coordinated research of a complex of indicators that reflect aspects of business processes, and containing general conclusions about the results of the production facility activities by identifying qualitative and quantitative differences from the base of comparison. One of the most popular methods of integrated economic analysis is a method of composite indicators and its various modifications, such as the positions amount method, the geometric mean method, the method of distances, methods of stochastic integrated assessment, which are often considered as independent in literature. Each method assumes a specific algorithm, but the use of a particular one to calculate the index of integrated assessment has certain limitations and especially because the methods themselves have drawbacks. Generally, the popularity of the methods of aggregates is determined by three circumstances, among which there are some disadvantages, which is presented in Table 1.

The problems mentioned above are solved in the proposed method, which allows to provide a scientific justification for an integrated assessment composition.

Table 1

The main advantages and disadvantages of integrated assessment

Advantages	Disadvantages
1. Easy to use, it's enough to have nonspecialized mathematics courses knowledge	1. No clear scientific basis for the indicators selection for the integrated assessment calculation
2. Intuitive perspicuity of a calculation procedure, which is easily perceived by a decision maker, so the intermediate and final results are easily interpreted	2. No records of the interchangeability or complementarity degree of the indicators used when choosing a function for the convolution of particular indicators in summarizing
3. High-invariance - the method consists of procedures that can be implemented in various ways, and the decision maker, according to the situation may collect a specific method modification from this set of various procedures	3. No records of the degree of indicators importance. that describe the selected object of analysis

At the same time the algorithm of realization of the proposed complex analysis methods is shown in Figure 1.

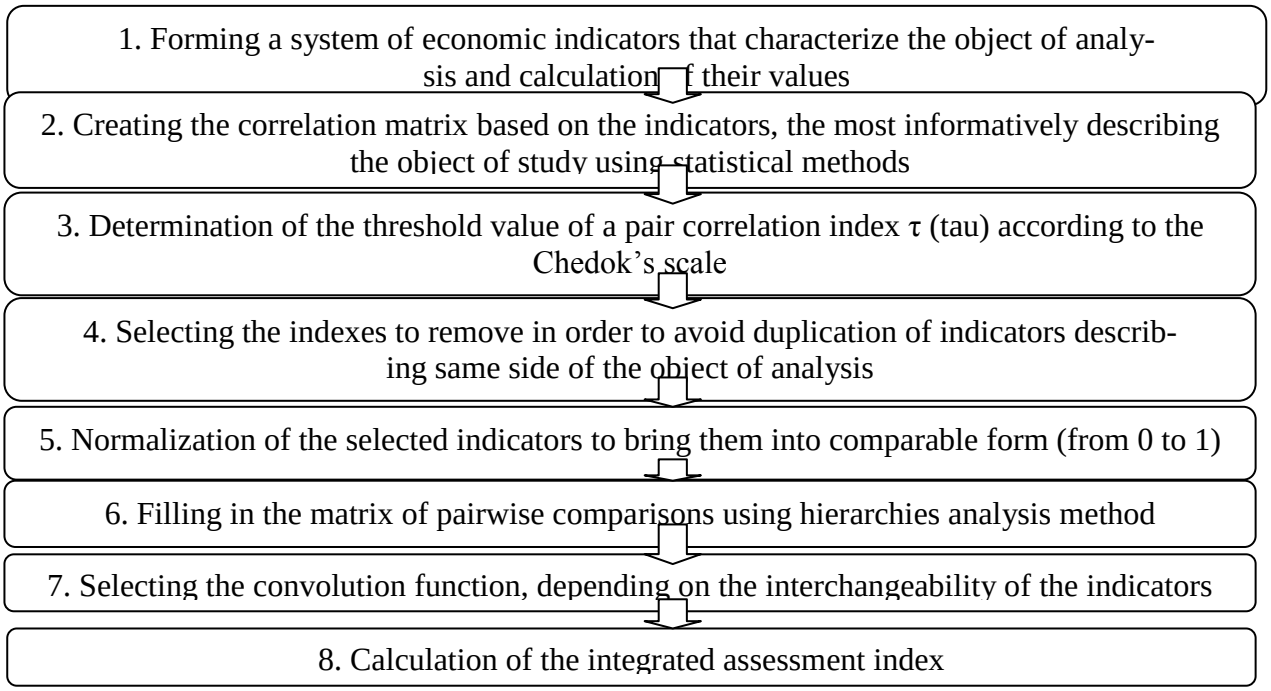

Figure 1 – Algorithm for calculating the index of integrated assessment

The figure shows that on the first and second phases there is a formation of a system of indicators describing all aspects of the enterprise activities and calculate their values in a appropriate historical period in the form of a database. Here we use maximum number of indicators that characterize the objects such as fixed assets, human resources, labor cost,material resources, costs, production and sales, taxes, funds, financial results, financial condition, etc.

On the third and fourth stages we should select the indicators that are most informatively describe interesting for analytics aspects of the enterprise activities. The selection is done using methods of natural, artificial and combined intelligence, as well as statistical methods and mathematical programming.

The formation of the normalized reduced space is implemented on the fifth step. Normalization allows leading diverse indicators such as the rate of current assets coverage, equity turnover duration in days, borrowed capital profitability as a percentage, the level of stock supply with the sources of their formation, etc. to a common scale.

When providing values of different size to a dimensionless interval [0, 1] a linear model is used, where direct and reverse valuation are applied depending on the direction of the indicators dynamics. Direct valuation is used when the growth rate is considered as a positive trend. Reverse valuation is used when the decline is a positive trend.

Significance indexes of normalized indicators, and a vector of priorities are determined on the sixth stage using the Saaty's method of pair comparisons.

The calculation of the integrated assessment J is performed on the seventh and eighth stages. The calculation is based on the convolution function, which is selected depending on the substitutability and complementarity of indicators, the degree of their

values variability (for example, the additive are used in case of high enough substitutability, multiplicative - if the substitutability is weak, logarithmic - in case of a large scatter of objects assessments).

Thus, we get a composite indicator substantiated by the calculations of integrated assessment between zero to one, which would then be reviewed by analyst and manager of the organization. Using the transfer scale of the integrated assessment indicator, which is presented in table 2, we can easily determine the organization's financial condition generally with the terms of «good-bad».

Then we can construct a summary diagram of the integrated assessment by analyzing integrated assessment indicator over a certain period of time.

Table 2

A transfer scale of a numerical composite indicator of integrated assessment into verbal value

Limits of an integrated assessment indicator	Verbal designation
[0-0,25)	unsatisfactorily
[0,25-0,5)	satisfactorily
[0,5-0,75)	good
[0,75-1]	excellent

The integrated assessment can be carried out for each structural unit and the whole enterprise, over different periods of time, and for each object of analysis.

The proposed method of calculating the complex indicator, thereby, can significantly improve the decisions validity to enhance competitive advantages and its effective management by:

- integrated assessments constructions, their interpretation and factor analysis on a space-time basis;
- assessments constructions with the terms of «good-bad», as more understandable for managers;
- reducing the manager's load;
- reducing time spent on the analytical procedures.