SUBSTANTIATION OF METHODOLOGICAL APPROACH TO THE COST ESTIMATION OF COMPETITIVENESS POTENTIAL OF A TRANSPORT ENTERPRISE

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ABSTRACT

The article addresses a methodological approach to the cost estimation of the competitiveness potential of a transport enterprise. The estimation of a transport enterprise's competitiveness involves several stages. The first stage defines the competitive status of a transport enterprise through the construction of a competitiveness matrix. The competitiveness coefficient of transportation service is defined at the second stage. Then the competitiveness of all services of transport enterprise is analyzed. The average value of competitiveness of all transport and related services is obtained through defining the estimation. To estimate the market cost of competitiveness potential appropriately, we determined competitiveness indicators and the cost of a transport enterprise. At the next stage of the given analysis, it is necessary to estimate how the aims and strategic plan for the development of the transport enterprise are achieved. The development efficiency, competencies implementation, and competitive advantages in the market were determined through a traditional approach (the effect and cost of the resources spent for obtaining efficiency).

INTRODUCTION

Competition, being the main element of the market system mechanism, forms the environment where the business object is immersed and outside of which it cannot function. The presence of competition among many manufacturers forms from them a unified whole, within the framework of which the unity of action of all elements of the market mechanism is ensured, thereby imposing for all of them a behavior according to the same rules (Vasiutina, 2011).

Scientific achievements in the management theory for the enterprise development, market competitiveness, and their advantages form a sufficient theoretical basis for estimating the potential and competitiveness of transport enterprises. Lack of systemic character and particular specialization in researches concerning kinds of transport and transportation are still the problems. According to Vovk (2013), estimation of the enterprise potential is concerned with the integral representation of current and future abilities of the economic system to transform input into economic benefit by means of its inherent enterprising capacities and to reach the aim in...
this way. Competitiveness potential analysis is based on
the methods used for defining the marketplace of the
enterprise and influence of the external environment.
But competitiveness estimation doesn't solve the
problem of strategic raising the potential cost and
effectiveness of its use.
According to Volosova and Petukhov (2014), the relative
nature of the concept should be considered when
estimating the competitiveness of particular enterprise
production. Production competitiveness can be defined
only by means of comparison with the similar
production; every customer has his/her own criterion
for estimation of production, which is confirmed with a
specific market.
Development of methodological approach to estimating
competitiveness potential, which is opposed to the
actual methods, based on combination of analysis of
internal and external environment of transport
enterprise. Analysis of the competitiveness of the
compared objects, if they are "participants in the
competitive struggle" in specific markets, firstly, must
assess the market itself, secondly, show its features that
determine the position of participants in the market, and
thirdly, the position of participants in specific markets
(Geleta, 2014).
The behavior of market participants is determined by its
state. Among several existing approaches that make it
possible to characterize the state of the market, the most
common one is when the characteristics of emerging
relations are presented as a function of the number of
economic entities, types of activity and its scale. Here,
the main characteristic of the market model is the
number of economic entities and volumes of products,
conditions of equal access to information, identifiers of
consumer properties of products, its homogeneous and
heterogeneous properties, legal conditions of
management, expressed in the possibility of carrying out
such activities and the absence of prohibitions.
Management of the competitiveness of a transport
company in terms of freight traffic is based on the
general laws of competition, taking into account the
specifics of the industry - freight transport, in which
railway enterprises are one of many. The axiom of
behavior in a market economy is the provision that only
the business develops that does not lose in the
competition in the market of goods and services. The
struggle itself takes place due to the fact that in a market
where the aggregate supply of a sufficiently large
number of producers exceeds the aggregate effective
demand of a large number of consumers for a specific
product or service. The business should be built in such
a way that, while fulfilling the main function which is
meeting the needs for the results of its activities while
minimizing the number of resources used, its
competitiveness should remain. (Nikolaev, 2005;
Cherniavskyi et al., 2019).
Since each management decision is concise, it is
necessary to take into account the specifics of the
management function, the complexity, peculiarity and
importance of the management object, the changing
conditions of place and time. There are three types of
management functions:
1. Planning designed to resolve the contradictions
between the system and the external environment.
2. An organization designed to resolve contradictions
between the elements of the system. The
implementation of this function is possible if the ways of
resolving the contradictions between the system and the
external environment are determined.
3. Regulation designed to compensate for the emerging
disturbances from both the external environment and
internal elements.
As you can see, the functions of organization and
regulation are carried out within the framework of
management decisions of the planning function,
ensuring the functioning and development of the system
in a specific environment. As for the content of the
management decision, in essence it is associated with
the purposeful implementation of a specific measure,
ensuring an increase in the competitiveness of transport
products. At the same time, the most important principle
of economic production must be followed: the company
must extract higher profits from its activities.
Thus, the article aims to build a complex matrix for
estimating the competitiveness of a transport enterprise
that accounts for cost and quality parameters of input
resources, estimation of levels of plan implementation,
etc.

MATERIALS AND METHODS
The theoretical and methodological basis of the research
is given the scientific works of the classics of economic
science, the works and publications of leading scientists
and specialists in the field of the theory of economics,
theory of innovation, philosophy, marketing,
management, as well as special methodological
literature on the development and realization of enterprise potential. To solve the problems of this study, common scientific methods were applied: the method of estimating the potential cost, the method of estimating the cost of the potential of competitiveness, the methods of estimating quantitative and qualitative indicators of resources. Analysis and estimation of the competitiveness of any enterprise is a complex and multifaceted process. In the modern economy, more than 100 approaches and more than 300 indicators are used to estimate the competitiveness of enterprises and their products and services. They are described in the works of many scientists, such as: Porter (2008), Kotler (2021), Fatkhutdinov (2006), Thompson and Strickland (2001) and others. In view of the fact that each enterprise has its own specificity of activities, not all of them can be applied to estimate the competitiveness of a particular enterprise. Despite considerable scientific interest in the problem outlined, it has not yet been systematically reflected in scientific research. Due to the diversity of approaches to the coverage of these topics in scientific publications, not all essential aspects of effective management of enterprises’ competitiveness potential have been reflected in the scientific literature. The problems of developing the theoretical, methodological, and practical recommendations to improve the management of the potential of competitiveness of the transport enterprises have been studied insufficiently. The suggested methodological approach to the estimation of the efficiency of competitiveness potential is based on estimation of quantitative and qualitative indicators of resources and capacities and represents the effectiveness of competences implementation and competitive advantages at the market. In order to substantiate the methodological approach to assessing the efficiency of competitiveness of transport enterprises, a method of "estimation of the cost of competitiveness potential" was suggested, which takes into account the economic parameters of the resources, opportunities and competences of economic potential and its development in a competitive environment in the form of competitive advantages. Is grounded on the analysis of the effect on the aggregate value of internal and external factors.

RESULTS AND DISCUSSION
Complex integral methods, which are based, as a rule, on expert researches of effect of one or another factor, have been widespread lately. One-purpose methodological approaches enable to solve problems concerning analysis of the state of the enterprise potential or to fix an integrated criterion to define competitive status and place of the enterprise at the market. Graphic methods of the analysis of potential competitiveness of the enterprise make it possible to define the place of production or enterprise in the market environment. In case of a substantiated choice of estimating parameters, it is possible even to define raising provision for competitive status.

The increasing degree of integration taking place in the world economic space in recent years confirms the imperativeness of the development of the transport infrastructure of Ukraine to ensure the effective functioning of these integration associations, mainly focused on the development of trade and transport enterprises. In this context, the modern international transport infrastructure of Ukraine needs an objective analysis and assessment, taking into account the needs determined by the imperatives of global development. Competitive analysis of Ukrainian transport companies is of paramount importance, as it will determine the directions of their modernization and competitive recovery of enterprises (Yankovoi, 2013; Sergeieva et al., 2021).

In the course of the study, we identified the dominant trends in the development of the international road transport services market (monopolization and protectionism; structural imbalances, namely, the predominance of European transport companies in the international automobile market; the predominance of private transport companies), which allowed us to determine the general vector of its improvement at the present stage of internationalization of world economic connections. Modern trends in the development of international transport infrastructure include the globalization of logistics, the predominance of non-monetary factors in the development of international transport infrastructure to increase the investment attractiveness of international transport infrastructure. In our opinion, now, when global competition is being formed in the world market of services for transport infrastructure enterprises, price competition is becoming an increasingly important area. Therefore, integrated logistics systems and intermodal transport technologies are developing steadily, since they allow
the optimal combination of various modes of transport. Transport companies today strive to minimize their risks and costs. Therefore, integrated associations of transport companies from different countries are gaining more and more popularity. Integration improves the efficiency of transport services (Yatskovy, 2013; Korniienko et al., 2021). An integrated transport scheme involves the conclusion of an agreement with a large international transport company, which builds and organizes the optimal transportation route, as well as concludes contracts for further transportation with forwarding companies operating in the countries through which the client's cargo is transported.

The main problems in the development of international transport infrastructure include the lack of uniform standards of the international customs system, poor accessibility of transport infrastructure, uneven involvement of various modes of transport in the transport infrastructure, the problem of security and attracting investments for modernization, transport industry, the problem of developing regulatory support for improving the transport system and the transport services market, lack of qualified specialists, territorial and structural inconsistencies in the functioning of transport infrastructure, insufficient mobility of the workforce in the transport infrastructure, poor quality of transport services, increased negative impact of vehicle operation on the environment, underutilization of integrated logistics systems, underdevelopment of intermodal transport technology and low use of information systems (Lifits, 2014).

Analysis of the methods of the production competitiveness estimation and enterprises potential has shown that the set of indicators of the effect of environment is the basis for estimation. Indicator's consistency and choice are formed by setting the aims of estimation, basic features of estimated object, consistency and tools for estimating, and the environmental factors. At transport enterprises estimation of the competitiveness potential is usually carried out by means of integral or graphic methods. Transportation services or enterprises of the same market are the object of estimation (Mikhailenko, 2013; Kano-Noriaki et al., 1984; Dubovik, 2012), at that the estimation is based on expert determination of the set of indicators and estimation of weight factors in integral criterion of comparison using parametric technique. There are several methods of competitiveness estimation, but integral factors are mainly used. In combination with graphic or rating methods they represent the place of service or enterprise at the market. However, there are no estimation of management control for competitiveness potential and analysis of environmental influence on potential formation and implementation. To substantiate methodological approach to estimation of the potential competitiveness efficiency of transport enterprises it is suggested to take into account economic parameters of resources, possibilities and competences of economic capacity and its development in competitive environment in the form of implemented competitive advantages. The sequence for estimating competitiveness potential at transport enterprises should correspond to stages of the process of potential development control as well as to the principles and functions of its implementation (Figure 1).

The common formula for rating the resources cost at the input is the following (equation 1):

\[
C_{ijc} = \sum_{j=1}^{g} \sum_{i=1}^{n} (P_i \cdot V_j) \cdot \frac{\sum_{k=1}^{K} l_{m_k}}{K} \cdot \frac{\sum_{k=1}^{K} l_{f_k}}{K} \cdot \frac{\sum_{k=1}^{K} \Pi_{T_k}}{K} \\
\cdot \frac{\sum_{k=1}^{K} l_{n_k}}{K} \cdot \frac{\sum_{k=1}^{K} l_{i_n_k}}{K} \cdot \frac{\sum_{k=1}^{K} \Pi_{B_k}}{K}
\]

Where: \(C_{ijc}\) – initial cost of i-kind of resource from j-source of supply, \(P_i\) – cost of resources, \(V_j\) – volume of demand for resources, \(i\) – kind of resources, \(n\) – number of kinds of resources, \(j\) – sources of supply, \(g\) – number of sources of supply, \(l_{m_k}\) – indicators of material resources, \(l_{f_k}\) – indicators of bankroll, \(l_{n_k}\) – indicators of information resources, \(l_{i_n_k}\) – indicators of innovative resources, \(l_{B_k}\) – indicators of investment resources, \(\Pi_{T_k}\) – indicators of natural resources, \(\Pi_{B_k}\) – indicators of intangible assets, \(k\) – indicator of i-group of indicators, \(K\) – number of indicators of resources type.

So, the cost of resources involvement to the enterprise is defined by the expenditure approach to the estimation of the enterprise potential and accounts the influence of the market factors. Having defined the initial cost of resources involvement, that accounts not only the price of the resources but also the influence of processes of supply and putting into operation, we estimate a further change of the resources cost of competitiveness potential in the transport enterprise activity. In the process of control, it is important to define the trends of
the influence of indicators change of use and optimality of resources composition for reducing cost of services, increasing correspondence with customers’ demands, quality and competitiveness at the market (Table 1).

**Figure 1. The process of estimating competitiveness potential***.

* developed by the author
Time of economic activity of transport enterprises concurs with the moment of services provision. That’s why not only the processes of change of money value (we did it using the tools of discounting), but also change of market conditions for resources involvement should be accounted when estimating competitiveness potential. So, the next stage of estimating competitiveness potential is implemented by means of a comparative approach to the estimation of potential cost using the method of sales comparison:

\[ C_{ij}^r = C_{ij} \times 1 \times \sum_{i=1}^{\text{Kn}} \rightarrow \text{max} \]  

Where: 
- \( C_{ij} \) - renewed cost of competitiveness potential, 
- \( K_n \) - correcting coefficient according to parameter \( n \), 
- \( 1 \) - price index for resources in the period from their purchasing to the moment of their estimation.

Estimation of the efficiency of formation and rise of competitiveness potential at transport enterprises, which is changed under the influence of internal environment and effectiveness of control systems, is done by means of analysis of the processes of assets capitalization. This method is used for estimation of the market status of the enterprise and represents the influence of effectiveness and profitability to competitive level of the enterprise. The common formula for defining the market cost of the potential is the following:

\[ Cr = \frac{\text{NOP}}{Kc} \]  

Where: 
- \( Cr \) - cost of competitiveness potential according to the results of its implementation, 
- \( \text{NOP} \) - net operational profit, 
- \( Kc \) - capitalization coefficient.

Table 1. Criteria for resources optimization in the process of efficiency estimation of competitiveness potential control at a transport enterprise

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Optimization function</th>
<th>Efficiency influence</th>
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<tbody>
<tr>
<td>Correlation of kinds of resources</td>
<td>( K_{\text{opt}}^k = D_t = PC = V_{mn} ) where the following conditions should be met:</td>
<td>Stock of materials (fuels and lubricants and components) and their timely delivery should predominate at the transport enterprise. Therefore, efficiency is provided at material, financial and informative resources.</td>
</tr>
<tr>
<td></td>
<td>1. Minimization of resources demand for account of expenditures minimization: ( D = \sum_{t=1}^{T} \sum_{i=1}^{n} P_{r} V_{i} (1 + r)^{-t} \rightarrow \text{min} ), ( D \leq V_j )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Limited sources: ( D \leq V_j )</td>
<td></td>
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<tr>
<td></td>
<td>where ( K_{\text{opt}}^k ) - coefficient of optimality for kinds of resources, ( D ) - demand for definite kind of resources, ( PC ) - producing capacity, ( V_{mn} ) - volume of transport services, ( P_{r} ) - resources price, ( V_{i} ) - volume of resources demand, ( i ) - kind of resources, ( n ) - number of kinds of resources, ( T ) - number of periods of use, ( t ) - period of estimation, ( j ) - sources of supply.</td>
<td></td>
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<tr>
<td>Resources mobility</td>
<td>( K_{\text{opt}}^m = C_i \rightarrow C_f ) where ( \frac{\text{Ci}}{\text{Cf}} \neq 1 ) (, \frac{\text{Cf}}{\text{Ci}} &lt; 1 )</td>
<td>In the terms of constantly rising cost of energy resources, availability of the most liquid assets (financial resources) is an indispensable term of development.</td>
</tr>
<tr>
<td></td>
<td>( \text{where } K_{\text{opt}}^m ) - coefficient of resources mobility, ( C_i ) - cost of i-kind of resources, ( C_f ) - cost of financial resources</td>
<td></td>
</tr>
<tr>
<td>Profitability of use</td>
<td>( K_{\text{opt}}^PR = PR_i \rightarrow \text{max} ) where ( K_{\text{opt}}^PR ) - coefficient of maximum profitability, ( PR_i ) - profitability of i-resource</td>
<td>Profitability represents effectiveness and suitability of use of resources.</td>
</tr>
<tr>
<td></td>
<td>( \text{where } K_{\text{opt}}^PR ) - coefficient of maximum profitability, ( PR_i ) - profitability of i-resource</td>
<td></td>
</tr>
<tr>
<td>Ability to saving and accumulation</td>
<td>( K_{\text{opt}}^\alpha = \sum_{t=1}^{T} \sum_{i=1}^{n} P_{r} V_{i} \left( \frac{P_{r} V_{i} + P_{r} H_{i}}{(1 + r)^{t}} \right) \rightarrow \text{max} ) Provided: ( \text{Ps}i \rightarrow \text{min} )</td>
<td>To provide constant flow of services and in terms of rising cost of energy resources it is necessary to fix maximum values of resources</td>
</tr>
<tr>
<td></td>
<td>( \text{where } K_{\text{opt}}^\alpha ) - coefficient of resources accumulation, ( \text{Ps}i ) - saving price of i-kind of resources.</td>
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</tbody>
</table>
The next stage in the efficiency estimation of competitiveness potential control is defining the level of its market capabilities, which are interpreted in specific status. For this purpose, we define competitiveness of the transport enterprise at the market. It should be taken into account that the internal economic potential is a potential forming factor. Rating estimation shouldn’t be the result of estimation. It should be expressed as an indicator of competitiveness influence on the potential cost and efficiency. Therefore, we suggest using a grade method for defining the competitiveness. The sequence of estimation of potential competitiveness of transport enterprises contains two main components:

1. Competitive status of the transport enterprise is defined by means of constructing matrix of competitiveness. Indicators of the efficiency of the resources use and capacities are analyzed, and the significance of the indicators is defined experimentally. Then perspective and depressive spheres of control are analyzed by means of the radar of competitiveness and value of competitiveness of the transport enterprise (Kte) is formalized into a unit system of estimation.

2. Coefficient of transport service competitiveness is defined by the following formula:

\[ K_i = \sum_{i=1}^{n} L_i \left( \frac{P_i}{P_{ie}} \right)^{\beta_i} \ldots \ldots \ldots \ldots (4) \]

Where: \( i = 1, ..., n \) – number of service parameters which take part in estimation;

\( L_i \) – coefficient of importance (significance) in comparison with the rest essential service parameters;

\( P_i \) – actual value of i-parameter;

\( P_{ie} \) – desired or reference value of i-parameter which makes it possible to meet demands of the customer;

\( \beta_i = +1 \), if the rise of \( P_i \) value favors the growth of the service competitiveness (e.g. service reliability etc.);

\( \beta_i = -1 \), if the rise of \( P_i \) value results in decrease of service competitiveness (e.g. terms, price, etc.).

Then competitiveness of all services of the transport enterprise is analyzed and the average value of competitiveness of all transport and related services is obtained by means of defining the estimation:

\[ K_n = \frac{\sum_{i=1}^{n} P_i}{J} \ldots \ldots (5) \]

Where: \( K_n \) – competitiveness coefficient of aggregate transport and related services, \( J \) – number of services at the transport enterprise.

It should be noted that the values obtained also vary from 0 to 1, as by estimating competitiveness of transport enterprise.

Having defined the indicators of competitiveness and cost of the transport enterprise, we estimate the market cost of competitiveness potential according to the formula:

\[ C_{CPTE} = \frac{C_{fr}K_n + C_rK_{te}}{2} \ldots \ldots (6) \]

Where: \( C_{CPTE} \) – cost of competitiveness potential of the transport enterprise,

\( K_{te} \) – coefficient of competitiveness of the transport enterprise.

At the next stage of the analysis of effectiveness of control of competitiveness potential it is necessary to estimate the achievement of development aims and strategic plan of the transport enterprise. There to, actual indicators of competitiveness (enterprise, production) and cost rise (as potential so goodwill) are compared with the planned ones. It makes it possible to define dynamics of competitiveness potential development, to reveal problems and prospects for controlling resources, capacities or methods of control system.

In order to estimate development efficiency and competences implementation and competitive
advantages in terms of the market we use a traditional approach to efficiency analysis according to the effect and cost of the resources spent for its obtaining. The author of the article considers as the effect either net profit of transport enterprise or goodwill growth: ECPTE=NP/CCPTE or ECPTE=G/CCPTE ..............(7)

The efficiency of a transport company is manifested in a large variety of aspects, each of which is reflected by a specific criterion of operational efficiency. In the case of activities for the provision of market services, the most important criterion is the efficiency of activities in the transport services market, representing its ability to provide services with the best quality parameters at minimum costs (Mansurov, 2011; Rodionova & Khakimova, 2012; Ovcharenko et al., 2020). The implementation of behavior that meets this criterion in conditions of various kinds of disturbances in the external and internal environment ensures the management of the competitiveness of a transport company. Nowadays, the construction of a management system for the competitiveness of a transport company is most often associated with the implementation of the principles of marketing or process approaches, where the tasks of operational and current management are predominant.

However, any task of operational and current management ensures the normal functioning of production, if it is solved within the framework of the implementation of a certain strategy. Therefore, the marketing or process approaches to managing the competitiveness of a transport company should be considered as a means of ensuring (achieving) strategic competitiveness. The strategic competitiveness of a transport company as a system of interconnected and interdependent elements of varying degrees of community is its ability to develop in order to maintain its competitive advantages in the long term in a changing environment, where the condition for its development is the purposeful development of elements. To ensure strategic competitiveness, a transport company must at least be competitive in the markets of transport services and resources through the formation and development of its competitive advantages. In particular:

- in the market of railway equipment - first of all, the ability to more efficiently use equipment in a broad sense in transport production.
- in the market of material resources - the ability to more efficiently use material resources in production;
- in the financial resources market - the ability for more efficient functioning of the enterprise’s monetary system, strict adherence to payment discipline, and rational use of savings. The management of such activities proceeds from the fact that the transport company is a large management system. In this system each element as a control object performs a strictly defined function that determines its place in the system and its relationship with others alike.

Its effective behavior is a local control goal associated, as a rule, by a complex mechanism with the global control goal as the effective behavior of the system as a whole.

CONCLUSIONS

The relevance of the study of the role and impact of the enterprise competitiveness in the processes of increasing and realizing its potential, as an important and methodologically productive factor in the development of the economic system, is due to the increasing uncertainty of the conditions of the enterprises functioning increased competition for the markets, as well as the need for efficient use of technological opportunities, justification of conditions of competitive partnerships, increase of profitability level and rate of capitalization, as well as the market status.

In order to evaluate the effectiveness of the development and implementation of competencies and competitive advantages in the market environment, we use the classic approach of analyzing efficiency by the effect and cost of resources spent on obtaining it, although other approaches to making efficiency analysis could be used. In order to estimate the potential for competitiveness in transport, it is important to ensure systematicity, to avoid narrow specialization in research on modes of transport and modes of transportation taking into account transport features. The developed methodology includes regression analysis to identify the relationship between the level of development of international transport infrastructure and the competitiveness of transport enterprises, identifies the degree of correlation of these indicators and uses them as a basis...
for recommendations to improve the competitiveness of transport enterprises.

In our method of economic analysis, the vector of all indicators is the same. In other words, higher indices indicate a better economic state of the organization, while lower values, on the contrary, indicate a worse economic state. The main advantages of the developed methodology include the complexity and multidimensionality of the analysis of the economic situation of the organization; comparability of data and the possibility of comparing different organizations, since standardized financial (accounting) reports are used for economic analysis; the ability to identify changes in the development of the economic state of the analyzed organization; based on the results of the analysis, it is possible for the organization to make more effective management decisions; the computational algorithm is flexible, it provides the implementation of mathematical modeling of the economic situation of the organization; Economic assessment provides identification of deviations in production and business indicators of the organization and allows you to take appropriate measures to increase the competitiveness of the enterprise.

Evaluation of the company's financial and production activities, planning of the company's activities and forecasting its development are possible due to the results of economic analysis. Conducting a comprehensive economic analysis using the selected indicators describes the economic state of the organization and allows to plan a strategy for increasing the competitiveness of a transport company, based on the obtained results.

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