AN APPROACH FOR ASSESSING THE BUSINESS ENTITY’S FINANCIAL POTENTIAL

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Abstract
The paper examines the issues related to assessing the level of economic entities' financial potential. Approaches to determining the essential content of the financial potential category are analyzed, followed by its consideration as the ability of the business entity to rational and efficient use of financial resources. The main approaches to assessing the level of financial potential are considered, their main shortcomings are identified, which mainly consist in insufficient substantiation of defining the boundaries of levels. It is established that one of the most common approaches to solving the problem of financial potential assessment is the use of comprehensive index assessment technology based on financial ratios. The main methods for data normalization and convolution of initial indicators are given. The paper considers the approach to design a financial potential composite index of the enterprise, which is based on the normalization of the initial indicators by comparing them with the normative values with their subsequent convolution into a single measure using the distance method. A verbal scale for determining the levels of financial potential is proposed. A new approach to the interpretation of calculation results has been developed by defining and substantiating the bounds of the composite index according to each level of financial potential, which is based on the use of the Harrington desirability scale. Practical testing of the approaches proposed is executed for PJSC "Khmilnyk garment factory "Lileia" according to the data of 2017-2019. Based on the calculations, the level of financial potential is identified as "normal", which allows us to conclude that the company's financial resources are sufficient for doing business.

Key words: business entities, financial potential, comprehensive index assessment technology, composite index, harrington scale

JEL Classification: C38; G34; J54; O16

I. INTRODUCTION

Ensuring the sustainable development of economic entities aimed at achieving strategic goals necessitates the use of qualitatively new approaches to management in a highly dynamic environment, growing global challenges, and destabilizing factors. This is especially important in the current context of the global crisis caused by the Covid-19 pandemic. UNCTAD estimates made in early 2020 that the global economy will lose about $1 trillion by the end of the year (see https://news.un.org/en/story/2020/12/1080762).

Therefore, one of the most important problems of business management is the effective use of the enterprise resource potential, in particular, the available financial resources. Irrational use of funds and, as a consequence, the insufficient realization of available financial opportunities can cause a decrease in liquidity, solvency, and financial stability of their activities, lead to losses, and even to bankruptcy. Under such conditions, the task of assessing the financial potential of economic entities, which is an important indicator of the response of the internal environment to external disturbances, becomes especially important.

The evaluation results make it possible to assess the adequacy of financial resources to ensure the company's ability to withstand destabilizing effects, contribute to the development of strategies aimed at minimizing losses and financial risk. The implementation of such a strategy provides production and financial flexibility, which is justified by a sufficient level of financial capabilities and the availability of real prospects for financial development. It is the financial potential that determines the success of the enterprise in current market conditions: the higher it is, the more competitive and attractive the company is. Therefore, assessing and identifying the level of financial potential is an urgent task of analyzing the enterprise's activities.
II. LITERATURE REVIEW

A business entity’s potential is its ability to deliver an expected outcome or address strategic issues with consideration of the existing system of internal and external constraints and taking into account its ability to evolve. Financial support has an important role in the realization of this ability, which is a necessary component of the resource provision of any organization. The measure of opportunities for the use of funds, in particular, to ensure current activities, future development, increasing its competitive potential is the financial potential of the enterprise. As a financial category, financial potential reflects the socio-economic relations arising in the process of entities' financial and economic activities related to the formation, distribution and redistribution, use, accumulation, and multiplication of financial assets, affect the financial condition, financial stability and determine the possibilities of the reproduction process to ensure economic growth.

Issues related to the formation, evaluation and use of financial potential remain in the focus of studies.

The analysis of approaches to the financial potential interpretation showed the complexity and ambiguity of the essential content of this category. Some scientists (see https://news.un.org/en/story/2020/12/1080762; Blashchak, 2019; Liakhovych, 2018; Bova & Khryniuk, 2017; Bova, & Khryniuk, 2017; Stoianenko, Zubko & Tereshchenko, 2019) identify this category with financial resources, which in our opinion doesn't fully correspond to the essence of potential as a set of available tools, demonstration of force or strength characteristics, opportunities in a particular area. We agree with the authors Bondar et al (2017), that in economic research, this term is used to describe the means, stocks, and sources that can be used to solve a particular problem or achieve a certain goal. The author Vasylykha (2020) defines in his article the financial potential not only as of the optimal composition of resource support for the enterprise but also as a result of using such resources in the context of achieving the enterprise's goals. However, the author doesn't clearly define the criteria for such optimality, neither in terms of resources nor in terms of results. An alternative approach is the concept of financial potential in the context of realizing the opportunities for efficient accumulation, distribution, and use of financial resources (Vasylykha, 2020; Antonenko, 2020; Mordovets, 2019; Zavidna, 2020; Navolska & Blashchak, 2019; Tkachenko, et al, 2019). We support the view of the authors Tkachenko et al. (2019) that financial potential can be defined as the ability of an entity to rationally and efficiently use the financial resources at its disposal, as well as the ability to increase, if necessary, the volume of these resources.

It should be noted that the above scholars' works also explore issues related to the processes of formation and effective use of financial potential to achieve strategic goals of business entities, in particular, the search for internal financial untapped opportunities and reserves, the relationship of financial potential with other its varieties, in particular, marketing, innovation, intellectual one. Under this approach, financial resources serve as a necessary basis for forming and realizing financial potential.

The financial potential occupies the highest step in the structure of the enterprise's internal potential because it determines the continuity of the enterprise. All stakeholders are interested in the continuity of economic activity, and therefore the financial potential assessment is an important component of the enterprise's overall analysis. It is quite common to use a rating assessment of financial potential in the scholars' approaches. In particular, Bova & Khryniuk (2017) proposes in theirs paper such an assessment by using the financial results from the implementation of all types of enterprise's plans (investment, production, marketing, personnel one), taking into account economic value added. Finally, all indicators are transformed into coefficients that reflect the financial condition of the enterprise with their further processing and identification of the financial potential level. A similar approach is implemented in the article of Partyn, Zaderetska & Hratsiian (2016). The authors of the research use a three-level scale to assess financial potential. Selezen (2017) proposed a five-level scale, which provides more opportunities to identify the financial potential level. In our opinion, the disadvantage of these approaches is the lack of justification of the levels' boundaries for the scales used. Besides, some authors propose to process ranking data using arithmetic operations, which is also not correct in our point of view.

Zavidna in her paper proposed a method of assessing financial potential by combining the hierarchical analysis method and the three-factor DuPont model (Mordovets, 2019). This makes it possible to streamline companies by reducing their financial stability, identify leaders and identify alternative enterprise development strategies. However, the author doesn't provide a mechanism for choosing such a strategy. The article of Sokolova, Veriasova & Sokolov (2019) offers an assessment of the realization of financial potential in the context of establishing the level of efficiency of the company based on the model of DEA multipliers. To implement the model, mathematical programming was used as a method of obtaining the optimal result. The authors identified the reasons for the ineffectiveness of campaigns. In our opinion, the application of this technique is quite complex and provides only an indirect assessment of financial potential.

The results of the study, presented in the article of Andrenko, Mordovcev & Mordovcev (2019) allow establishing the main directions of accumulation, formation, and distribution of financial resources.
in the context of the shaping financial potential taking into account internal and external risks, to make short-term forecasting of its level. However, there are no specific rules in the paper for assessing the potential.

Fylypenko and Koliesnik proposed to assess the financial potential level by consideration of the resource and competence of its components on the criteria of financial resources’ availability, their ensuring by funding sources, as well as the level of financial competencies development (Zherlitsyn, Levitskyi, Mykhailyk & Ogloblina, 2019). The authors provide a list of indicators for such an assessment, but there is no mechanism and rules for calculations.

The definition of financial potential in the logistics of operations, taking into account the destabilizing effects of the external environment in crises and the establishment of interdependence between financial and logistical potential is considered in the article of Fylypenko & Koliesnik (2020). However, these models are too formal and unsuitable for practical use.

The relationship between the digitalization of the firm and the level of use of its financial potential is presented in the study of Filipiak & Dylewski (2017). In particular, the nonlinear form of such dependence is established and its key characteristics are defined.

One of the most frequently used approaches to assessing financial potential is the use of comprehensive index assessment technology (Antonenko, 2020; Kohtamaki et al. 2019; Hryhoruk & Khrushch, 2013; Khrushch & Zhelikhovska, 2011; Khrushch, 2019; Larikova, 2014). These techniques focus on the use of different types of initial indicators' normalization, different types of convolution, and different scales for the interpretation of the result. The disadvantage of the approaches is the lack of justification for the choice of boundaries to establish the financial potential levels.

Given the shortcomings presented in the analysis of previous research, the purpose of this paper is to improve the methodology for assessing the financial potential level with the designing and justifying the appropriate levels scale.

III. RESEARCH METHODOLOGY

To assess the business entity’s financial potential, we use the comprehensive index assessment technology (Berzhanir, Vinnytska, 2018). It allows for a complete reduction of baseline indicators to a single one, comprehensive index with minimal information loss. We call this indicator a financial potential composite index (FPCI). This study proposes a computational procedure for constructing this indicator. Its feature is the use of the Harrington desirability scale (1965), which allows establishing a correspondence between the quantitative value of the indicator and the level of its qualitative characteristics (Hryhoruk, 2014). This gives soundness to the interpretation procedure for the final result.

At the first stage of the procedure for constructing FPCI, it is necessary to identify the set of initial indicators that are used to perform calculations. Analysis of the scholars’ studies in this field gives a conclusion that such indicators may be financial ratios that reflect the characteristics of the financial condition of the entity. The next stage is to normalize the initial data. It is since financial indicators have different ranges of values and different ways of influence the final result. Normalization is usually carried out according to the following rules:

\[
\mu_{ij} = 1 - \frac{|x_{ij} - x_j^*|}{x_{jmax} - x_{jmin}}, \quad (1)
\]

where \(\mu_{ij}\) – normalized indicators’ values,
\(x_{ij}\) – initial indicators’ values,
\(x_{jmin} = \min_i x_{ij}\), \(x_{jmax} = \max_i x_{ij}\),
\(i = 1..m\), \(j = 1..n\),
\(m\) – number of objects observed (or periods when the study is conducted for one business entity),
\(n\) – number of initial indicators.

Values \(x_j^*\) are identified by the formula:

\[
x_j^* = \begin{cases} x_{jmax}, & \text{when } X_j \text{ is an incentive;} \\ x_{jmin}, & \text{when } X_j \text{ is a disincentive;} \end{cases} \quad (2)
\]

Also, quite common is the approach to normalization, which maintains the proportions between the initial values, which allows saving the influence of normalized indicators’ values on the final result. It is conducted by the formula:
\[ u_{ij} = \begin{cases} 
\frac{x_{ij}}{x_{j \max}}, & \text{when } X_j \text{ is an incentive;} \\
\frac{x_{j \min}}{x_{ij}}, & \text{when } X_j \text{ is a disincentive;} 
\end{cases} \quad (3) \]

This approach has the disadvantage that the normalization is determined by the available data in the sample. Changing the sample can cause the smallest and largest values to change, which can affect the final result. Besides, this approach doesn't allow for normalization, provided that the assessment of the financial potential is provided for one data series (data are measured for one business entity and one period).

For the vast majority of financial ratios, which are selected in this study as the source data, defined normative or recommended values that can be used as the optimal one. In this case, the normalization procedure can be done using the formula:

a) when \( x_{ij} \) is incentive:
\[ u_{ij} = \begin{cases} 
0, x_{ij} < 0; \\
\frac{x_{ij}}{x_j^*}, 0 \leq x_{ij} \leq x_j^*; \\
1, x_{ij} > x_j^*; 
\end{cases} \quad (4) \]

b) when \( x_{ij} \) is disincentive:
\[ u_{ij} = \begin{cases} 
0, x_{ij} \leq 0; \\
\frac{x_j^*}{x_{ij}}, x_{ij} \geq x_j^*; \\
1, 0 < x_{ij} < x_j^*; 
\end{cases} \quad (5) \]

where \( x_j^* \) is regulatory (normative) or recommended value selected as the optimal one.

This method of normalization does not depend on the sample but has the disadvantage that not all indicators have such optimal values of \( x_j^* \).

In the third stage, the calculation of the composite index. For this purpose, one of the convolutions of the initial normalized indicators may be used [29]:

\[ FP\text{PCI}_A = \sum_{j=1}^{n} w_j u_{ij} \quad (6) \]
\[ FP\text{PCI}_{M1} = \prod_{j=1}^{n} u_{ij}^{w_j} \quad (7) \]
\[ FP\text{PCI}_{M2} = -1 + \prod_{j=1}^{n} (1 + u_{ij}^{w_j}), \quad (8) \]
\[ FP\text{PCI}_D = 1 - \sqrt{\frac{\sum_{j=1}^{n} w_j (1 - u_{ij})^2}{\sum_{j=1}^{n} w_j}} \quad (9) \]

where \( FP\text{PCI}_A \), \( FP\text{PCI}_{M1} \), \( FP\text{PCI}_{M2} \), \( FP\text{PCI}_D \), are the values of the composite index, \( i=1..m \); \( w_j \) - weight coefficients of indicators, \( j=1..n \). There are no formal rules that would favor one type of convolution over another. Weight coefficients are selected with taking into account condition:
\[ \sum_{j=1}^{n} w_j = 1. \quad (10) \]

Condition (10) unitedly with the implementation of normalization procedures according to formulas (1), (3) provides the value of the composite index in the range from 0 to 1.

Following the steps of the computational procedure for designing an FPCI is sufficient to solve the problem of assessing the financial potential level. However, to improve the interpretation of the composite index obtained, we propose to project its values on Harrington’s desirability scale. To do this, we use Harrington’s function:
\[ d_i = H(Z_i) = \exp(- \exp(-Z_i)), \quad (11) \]

where \( Z_i \) is the value of the initial indicator on the Z-scale. The values of the function \( d = H(Z) \) form a scale of desirability.

Let us establish a correspondence between the values of the Z-scale of Harrington’s function and the values of the FPCI. Analysis of the graph of the function \( H(Z) \) (Figure 1) shows that \( H(-2) \approx 0, H(5) \approx 1 \), therefore, the operating range of Z-scale values is the range \([Z_1, Z_2] = [-2, 5]\). The correspondence between the level of desirability and the quantitative value on the desirability d-scale is shown in Table 1. Using the same values of the levels on the desirability d-scale let us introduce the designation of financial potential.
levels following Table 2.

![Graph](image)

**Figure 1** – Harrington function graph

Source: Author’s creation

### Table 1. The relations between the quantitative values of the desirability scale and its qualitative levels

<table>
<thead>
<tr>
<th>Qualitative expression of desirability level</th>
<th>The range of quantitative values on the d-scale of desirability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good</td>
<td>0.80..1.00</td>
</tr>
<tr>
<td>Good</td>
<td>0.63..0.80</td>
</tr>
<tr>
<td>Satisfactorily</td>
<td>0.37..0.63</td>
</tr>
<tr>
<td>Badly</td>
<td>0.20..0.37</td>
</tr>
<tr>
<td>Very badly</td>
<td>0.00..0.20</td>
</tr>
</tbody>
</table>

### Table 2. The relations between the qualitative level of the desirability qualitative level of financial potential

<table>
<thead>
<tr>
<th>Qualitative expression of desirability level</th>
<th>Qualitative level of financial potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good</td>
<td>High</td>
</tr>
<tr>
<td>Good</td>
<td>Normal</td>
</tr>
<tr>
<td>Satisfactorily</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Badly</td>
<td>Critical</td>
</tr>
<tr>
<td>Very badly</td>
<td>Crisis</td>
</tr>
</tbody>
</table>

From the analysis of the graph, we can also conclude that the desirability level "very good" corresponds to the range of values on the Z-scale in the range from 1.5 to 5 of the defined operating range of values \([Z_1, Z_2]\). To convert the values of the composite index \(FPCI\) to the value of the Z-scale to fully cover the operating range of this scale, we can use the transformation:

\[
Z_j = (Z_2 - Z_1) \frac{FPCI_j - FPCI_{\text{min}}}{FPCI_{\text{max}} - FPCI_{\text{min}}} + Z_1 = 7FPCI_j - 2, \tag{12}
\]

\[j = 1..m.\]

Here we take into account the fact that \(FPCI_{\text{min}}=0, FPCI_{\text{max}}=1, Z_2=5, Z_1=-2\). However, with such a transformation, half of the composite values' range will correspond to the "high" level of financial potential, which, in our opinion, is an overestimation. Therefore, we will use a different approach to the transformation. Assume that the "high" level will correspond only to the lower limit of the corresponding range of \(d\)-scale values \(d=0.8\). Then the upper limit \(Z_2\) of the working area of \(Z\) is shifted to the value \(Z_2 = 1.5\), and formula (12) has a form:

\[
Z_j = 3.5FPCI_j - 2. \tag{13}
\]

The values on the Z-scale, corresponding to the boundary's values of the ranges of desirability on the \(d\)-scale and the corresponding values of the composite index \(FPCI\) are given in Table 3. The transformation is carried out by the formulas:

\[
Z = -\ln(-\ln(d)), \tag{14}
\]
\[ FPCI = \frac{Z^2}{3.5}. \] (15)

<table>
<thead>
<tr>
<th>Table 3. The relations between the bounds' values of d-scale and appropriate values on Z-scale and FPCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bounds' values of d-scale</td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>0.2</td>
</tr>
<tr>
<td>0.37</td>
</tr>
<tr>
<td>0.63</td>
</tr>
<tr>
<td>0.8</td>
</tr>
</tbody>
</table>

The correspondence between the financial potential level and the values' ranges of the FPCI are presented in Table 4.

<table>
<thead>
<tr>
<th>Table 4. The relations between the qualitative level of the desirability qualitative level of financial potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>The range of FPCI values</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>1.00 (no range, only one value)</td>
</tr>
<tr>
<td>0.79..1.00</td>
</tr>
<tr>
<td>0.57..0.79</td>
</tr>
<tr>
<td>0.44..0.57</td>
</tr>
<tr>
<td>0.00..0.44</td>
</tr>
</tbody>
</table>

Transformations by the formulas (14) and (15) are especially justified in the case when the procedure of indicators' normalization is carried out according to formulas (4) and (5): the "high" level for the assessment of financial potential will be reached when all components achieve values not less than their normative ones.

The above procedure for designing the values of the composite index on the desirability scale provides sound values of the FPCI's bounds to identify the financial potential levels.

**IV. RESEARCH RESULTS**

Let us illustrate the above approach for assessing the financial potential levels using the comprehensive index technology on the example of PJSC “Khmilnyk garment factory "Lileia". As data for evaluation, we choose financial condition indicators of the enterprise, calculated using its financial statements [30]. In this case, the set of initial indicators includes only those for which there are established normative (recommended optimal) values. These indicators are presented in Table 5.

<table>
<thead>
<tr>
<th>Table 5. The list of initial financial indicators and their normative values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial indicators</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>X₁ Absolute liquidity ratio</td>
</tr>
<tr>
<td>X₂ Quick liquidity ratio</td>
</tr>
<tr>
<td>X₃ Current liquidity ratio</td>
</tr>
<tr>
<td>X₄ The ratio of coverage of inventories and costs</td>
</tr>
<tr>
<td>X₅ The financial stability ratio</td>
</tr>
</tbody>
</table>

The indicators normalize according to formula (4), taking into account that all indicators are incentives. The results are placed in Table 6. To calculate the values of FPCI we use formula (9). Since we don't have any information on the advantage of some indicators over others, their weights are taken as equal: \( w_j = 0.2, j = 1..5 \). The calculated values of the composite index and their corresponding financial potential levels are given in the Table 7.
The developed approach to the interpretation of the calculations' results of financial potential allows for the possibility of its practical application. Areas of further research are to improve approaches to the construction of composite index allowed to substantiate its benefits for solving this problem, among which the crucial role is given to the use of comprehensive index assessment methodology. Thus, during the study period, PJSC "Khmilnyk garment factory "Lileia" has a "normal" level of financial potential, although the value of the composite index FPCI has changed slightly. This indicates the sufficiency of providing the enterprise with financial resources and the choice of a rational financial strategy by the company's management.

V. CONCLUSION

Investigating scholars' publications, it was found that assessing the level of the financial potential of business entities remains an urgent issue and is the focus of many modern researchers. The analysis of publications allowed us to conclude the complexity and ambiguity of approaches in determining the essential content of the category of financial potential. Studies have shown a variety of approaches to solving this problem, among which the crucial role is given to the use of comprehensive index assessment methodology. This approach allows compressing the initial data to a single latent measure of the studied characteristics while maintaining their informativeness. The given approach to design a financial potential composite index of the enterprise allows considering the degree of conformity of initial indicators to their normative values at carrying out their convolution. The paper proposes a scale for financial potential levels. The developed approach to the interpretation of the calculations' results of financial potential composite index allowed to substantiate its bounds for each level. The testing of the offered toolkit on real data showed the possibility of its practical application. Areas of further research are to improve approaches to the construction of composite index by taking into account indicators of non-metric nature.

REFERENCES


Table 6. The values of normalized data

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>U1</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>U2</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>U3</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>U4</td>
<td>0.66</td>
<td>0.48</td>
<td>0.57</td>
</tr>
<tr>
<td>U5</td>
<td>0.76</td>
<td>0.78</td>
<td>0.84</td>
</tr>
</tbody>
</table>

Table 7. The results of identifying the level of the financial potential of normalized data

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPCI</td>
<td>0.88</td>
<td>0.84</td>
<td>0.87</td>
</tr>
<tr>
<td>The level of financial potential</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Thus, during the study period, PJSC "Khmilnyk garment factory "Lileia" has a "normal" level of financial potential, although the value of the composite index FPCI has changed slightly. This indicates the sufficiency of providing the enterprise with financial resources and the choice of a rational financial strategy by the company's management.