The dynamics of the stability of the functioning of ZAO Belgorodskij cement in 2016-2019

I A Slabinskaya¹ and O B Benderskaya²

¹ Department of Accounting and Auditing, Belgorod State Technological University named after V G Shukhov, Kostyukov St., 46, Belgorod, 308012, Russia
² Department of Accounting and Auditing, Belgorod State Technological University named after V G Shukhov, Kostyukov St., 46, Belgorod, 308012, Russia

E-mail: obenderskaya@gmail.com

Annotation. Stability of functioning is one of the main goals of managing economic entities, whether they are independent business units or divisions of business associations. The complexity of this economic category determines the need to improve scientifically grounded instruments for measuring, assessing and monitoring the level of sustainable functioning. One such tool is the comparative comprehensive assessment (CA) of the stability of functioning, which is described in this article. The assessment author's methodology is based on a system of 12 indicators of the stability of functioning. For a dynamic comparative assessment of enterprise, the author's method of calculating a comprehensive assessment is used - a modified method of scoring. The object of the research is ZAO Belgorodskij cement, one of the largest enterprises in the building materials industry in the Belgorod region. The subject of the research is the dynamics of the stability of the functioning of ZAO Belgorodskij cement in the period 2016-2019. During this period, there was a constant struggle between the local authorities and the management of the enterprise for the closure of the plant, which the plant managers oppose. The objectives of the study are to improve the methodology for a comprehensive assessment of the stability of functioning and assess the impact of uncertainty in the position of the plant on the stability of its functioning.

1. Introduction

ZAO Belgorodsky Cement, part of the Eurocement Group holding, is one of the most famous enterprises in the building materials industry in the Belgorod region [8, 11]. The cement plant was built immediately after the Great Patriotic War and played an important role in the restoration of Belgorod, destroyed by the war, in its development at all subsequent stages of history and in the development of scientific schools of technologies for the production of cement and building materials and products from it [6, 7, 10, 14]. However, a dispute has been going on between the leadership of the Belgorod region and the holding company to close the enterprise over the past five years. Local authorities believe that the plant, with its outdated equipment and spent quarries, is causing environmental damage to the city [1]. The holding's management does not want to part with a profitable asset. While the plant continues to operate, changing managers, stopping (according to the holding's management) most of the furnaces and reclaiming the open pits. In this article, we find out...
2. Methods and techniques

The main method of the study is the author's modified method of scoring, one of the methods for calculating a comprehensive assessment [13]. The type of CA used is dynamic comparative CA. It allows you to quantitatively measure the level of sustainability of the enterprise in each year from the chronological series, as well as assess the change in the level of sustainability over time.

The study is also based on a systems approach, methods of analysis and synthesis (generalization), it uses dynamic multidimensional comparisons, the coefficient method, and statistical methods (calculation of average values and growth rates).

The methodology for assessing the sustainability of the functioning of enterprise is based on a system of twelve indicators of the stability of functioning [12]. These indicators can be seen in table 1. The following values are considered normal:
- the share of stable sources of capital – above 0.5;
- stable sources share in stock financing – at least 0.6;
- coverage of current liabilities with current assets – at least 2;
- cost per one ruble of revenue – less than 1;
- growth rates – at least 100 %;
- profitability indicators – above 0.

It should be noted that a specific standard cannot be defined for the number of turns of total assets for the year. Its focus – the more the better.

According to the modified scoring method, the comprehensive assessment is calculated using the formula

$$\text{CA}_i = \frac{\sum_{j=1}^{m} b_{ij}}{m}, \quad i = 1, n,$$

where

$$b_{ij} = b_{\min} + \frac{a_{ij} - a_{\text{worst}j}}{a_{\text{best}j} - a_{\text{worst}j}} (b_{\max} - b_{\min}).$$

A dynamic complex assessment is calculated for an individual enterprise over a number of periods. In this case, $n$ is the number of compared periods (in our case, $n = 4$); $m$ is the number of indicators (in our case, $m = 12$); $a_{ij}$ – value of the $j$-th indicator for the $i$-th period; $b_{ij}$ – score of the $j$-th indicator for the $i$-th period; $a_{\text{worst}j}$ and $a_{\text{best}j}$ – respectively, the worst and the best among the values of the $j$-th indicator; $b_{\min}$ and $b_{\max}$ are the minimum and maximum values of the score, respectively, which correspond to the worst and best values of the indicators. We have set $b_{\min} = 0$; $b_{\max} = 10$. In this case, the value of the complex assessment (1) can vary from 0 to 10. $\text{CA} = 0$, if in the estimated period the values of all indicators of enterprise stability are worse than in other periods; $\text{CA} = 10$, if in the estimated period the values of all indicators of enterprise sustainability are better than in other periods. Thus, CA (1) determines the level of stability of functioning on a 10-point scale relative to the best and worst values of the assessment indicators $a_{ij}$ for the entire studied period.

3. Results

Table 1 shows the values of indicators of stability of the functioning of ZAO Belgorodskij cement in the period under study. The best values of indicators in the table are highlighted, and the worst are underlined.
was solvent for current liabilities, as the degree of their decrease, but remained at a good level. During 2016–2019, due to a loss, retained earnings and equity decreased. In 2019, the final financial result was a loss, which led to negative values of these indicators. The rest of the profitability indicators were positive during 2016–2018, although a slowdown in 2018, although a slowdown was observed. In 2019, due to a loss, retained earnings and equity decreased.

According to the change in the level of production costs, the return on sales, calculated by profit from sales, in 2017 and 2018 grew, and in 2019 decreased, but remained at a good level – 14.09%. The rest of the profitability indicators were positive during 2016–2018, but their level by 2018 decreased significantly, and in 2019 the final financial result was a loss, which led to negative values of these indicators.

The growth of retained earnings and equity continued throughout 2016–2018, although a slowdown was observed. In 2019, due to a loss, retained earnings and equity decreased [15].

Thus, in 2016–2019, against the background of strengthening financial condition and rather high efficiency of production at ZAO Belgorodskij cement, financial results have consistently deteriorated. According to the values of the dynamic complex assessment of the stability of functioning in the last row of table 2, it is clear that this led to a significant decrease in the level of stability of ZAO

**Table 1. Indicators of the stability of functioning of ZAO Belgorodskij cement in 2016-2019.**

| Indicators, units | Indicator values |
|-------------------|------------------|
| 1) the share of stable sources of capital (average annual value) | 0.59 0.84 0.88 **0.91** |
| 2) stable sources share in stock financing (average annual value) | 1.52 3.37 4.03 **4.40** |
| 3) coverage of current liabilities with current assets (average annual value) | 2.54 4.08 6.13 **7.54** |
| 4) the number of turns of total assets for the year | **0.70** 0.51 0.55 0.49 |
| 5) cost per one ruble of revenue, rub. | 0.85 0.84 **0.82** 0.86 |
| 6) revenue growth rate, % | 91.48 69.70 **112.84** 93.22 |
| 7) retained earnings growth rate, % | **132.84** 118.66 105.69 98.74 |
| 8) the growth rate of equity, % | **128.09** 116.56 105.15 98.86 |
| 9) profitability of sales on profit from sales,% | 14.56 16.08 **17.87** 14.09 |
| 10) return on sales in net profit, % | 12.48 **13.52** 4.34 -1.09 |
| 11) return on total assets, % | **12.50** 8.60 1.58 -0.78 |
| 12) return on equity, % | **24.63** 15.30 5.02 -1.15 |

The first four indicators characterize the financial condition of the enterprise. During 2016-2019, their values were in line with the standards. Thus, the share of stable sources of financing was at least 0.59, grew in dynamics and in 2019 reached 0.91. This indicates a high degree of financial independence and leads to a low risk of insolvency. The share of long-term sources in financing production and other reserves has also consistently increased. During 2016-2019 the reserves were fully funded by stable sources. This indicates a low risk of production interruptions and also contributes to solvency. The enterprise was solvent for current liabilities, as the degree of their coverage with current assets was sufficient and grew in dynamics. So, in 2019, current assets were 7.54 times higher than the value of current liabilities. Deterioration in dynamics was observed only in terms of the indicator of the business activity of the enterprise – in terms of the rate of turnover of assets. In general, we can conclude that the financial condition of ZAO Belgorodskij cement in 2016-2019 was normal and improved over time.

The level of the cost of production of the plant in 2016-2019 was also normal and decreased until 2018 inclusive. Some growth in the indicator in 2019 was insignificant. Thus, the main activity of the plant was quite efficient.

Revenues from the sale of ZAO Belgorodskij cement products in the period under study decreased, except for 2018, when their growth was 12.84%.

According to the change in the level of production costs, the return on sales, calculated by profit from sales, in 2017 and 2018 grew, and in 2019 decreased, but remained at a good level – 14.09%. The rest of the profitability indicators were positive during 2016-2018, but their level by 2018 decreased significantly, and in 2019 the final financial result was a loss, which led to negative values of these indicators.

The growth of retained earnings and equity continued throughout 2016-2018, although a slowdown was observed. In 2019, due to a loss, retained earnings and equity decreased [15].
Belgorodskij cement in 2019. If in 2016-2018 CA values changed, respectively, by -0.21 and by 0.46 points, then in 2019 there was a decrease immediately by 2.87 points.

Table 2. Scores of indicators and dynamic comparative CA of ZAO Belgorodskij cement in 2016-2019.

| Indicator numbers | Scores of indicators |
|-------------------|----------------------|
|                   | 2016 | 2017 | 2018 | 2019 |
| 1)                | 0    | 7.96 | 9.04 | 10   |
| 2)                | 0    | 6.42 | 8.70 | 10   |
| 3)                | 0    | 3.08 | 7.17 | 10   |
| 4)                | 10   | 1.02 | 2.80 | 0    |
| 5)                | 1.25 | 5.27 | 10   | 0    |
| 6)                | 5.05 | 0    | 10   | 5.45 |
| 7)                | 10   | 5.84 | 2.04 | 0    |
| 8)                | 10   | 6.06 | 2.15 | 0    |
| 9)                | 1.25 | 5.27 | 10   | 0    |
| 10)               | 9.28 | 10   | 3.71 | 0    |
| 11)               | 10   | 7.06 | 1.78 | 0    |
| 12)               | 10   | 6.38 | 2.39 | 0    |
| Dynamic comparative CA | 5.57 | 5.36 | 5.82 | 2.95 |

The relatively low CA values are explained by the fact that for the period 2016-2019 there has never been a year in which the level of stability indicators of ZAO Belgorodskij cement would have been much better than in other years.

As noted above, CA defines a relative, not an absolute level of resilience. In order to correctly assess its values, it is necessary to analyze the compliance of the assessment indicators with the standards.

ZAO Belgorodskij cement had the highest level of operational stability in 2018. At that time, all stability conditions were met. The values of the three assessment indicators were the best over the entire study period. This allows us to assess the level of stability of ZAO Belgorodskij cement in 2018 as absolute. In another article, we compared the stability of the functioning of five enterprises of the building materials industry in the Belgorod region in 2018 and found that ZAO Belgorodskij cement had the highest stability, which confirms the conclusion about absolute stability.

In 2016, only one condition for the sustainability of functioning was violated – revenue declined. The values of the five assessment indicators were the best over the entire study period. The CA value was only 0.25 below the best value. This level of sustainability can be considered excellent.

In 2017, one condition for the stability of functioning was also violated. Only one assessment indicator had the best value. The CA value was 0.46 below the best value. Let us estimate this level of stability of functioning as normal.

In 2019, six assessment indicators did not meet the standards. However, their values were quite a bit worse than the normative level. At the same time, the values of the other three indicators were the best for the entire studied period. Therefore, it would be wrong to say that ZAO Belgorodskij cement was unstable in 2019. This level can be described as quite satisfactory.

The reasons for the significant decrease in the stability of the plant's operation in 2019 deserve a more detailed consideration. As mentioned above, they are in receiving a net loss at the end of 2019. The immediate reason for the loss was the increase in the amount of interest paid compared to 2018. It
can be assumed that this is interest on long-term borrowed funds, which, since 2016, constitute more than 40% of all sources of financing for ZAO Belgorodskij cement. Knowing the procedure for financing production units adopted in holdings, it can be assumed that the plant pays interest on long-term loans from the parent company, and the amount of interest paid is regulated at the discretion of the holding's management. This can be a convenient lever for regulating the profitability of an enterprise. One can only assume what goals this regulation pursues: minimizing tax payments to the local budget or accumulating arguments for closing production.

4. Summary
Based on the results of the study, it can be concluded that ZAO Belgorodskij cement is a successful company: during 2016-2019 it functions steadily, its financial condition is strengthening, the volume of assets is growing. It can be concluded that the uncertainty of the plant's position does not affect its economy. True, there are periodic fluctuations in the level of stability of the plant, the amplitude of which is growing in dynamics. If the identified trend continues, in 2021 the plant should be expected to lose its ability to function sustainably. However, it seems to us that the management of ZAO Belgorodskij cement fully controls the economic situation at the plant. Analysis of the data from the financial statements of the enterprise suggests that the nature of fluctuations in the level of its stability is controlled by the holding's management. Therefore, further dynamics will be determined not by previous trends, but by political motives and the impact of the COVID-19 pandemic on the building materials industry.

5. References
[1] Bryantseva T A, Shevchenko M V 2019 Innovative leadership of the region: assessment issues and strengthening factors (on the example of the Belgorod region) Problems of the modern economy 4 128-130
[2] Bukhonova S M, Doroshenko Yu A, Trunova E V 2004 Application of sustainability performance indicators in company management Economic analysis: theory and practice 9 10-21
[3] Bukhonova S M, Sergeeva S A 2017 Problems of reindustrialization of Russian industry on the new technological principles Bulletin of BSTU named after V G Shukhov 10 194-203
[4] Chizhova E N, Shevchenko M V 2011 Integral efficiency of management system of the industrial enterprise Bulletin of BSTU named after V G Shukhov 1 95-99
[5] Chizhova E N, Sorokina V Yu, Vesmina O O, Osychenko E V 2018 The concept of monitoring the management of innovative industrial enterprise Bulletin of BSTU named after V G Shukhov 11 156-163
[6] Klyuev S V, Klyuev A V, Shorstova E S 2019 The micro silicon additive effects on the fine-grassed concrete properties for 3-d additive technologies Materials Science Forum 974 131–135 doi:10.4028/www.scientific.net/MSF.974.131
[7] Dmitrieva T V, Markova I Yu, Stroko V V, Bezrodnykh A A, Kutsyna N P 2020 Efficiency of stabilizers of various compositions for strengthening soils with mineral binders Construction Materials and Products 3(1) 30-38
[8] Doroshenko Yu A, Golubotskikh M 2017 Factors of competitive sustainability and assessment of their influence on enterprises within building materials industry Bulletin of BSTU named after V G Shukhov 1 26-31
[9] Doroshenko Yu A, Klimashevskaya A 2017 The analysis of scientific and technical potential of the enterprises of construction materials industry in the context of assessment of need of carrying out technological modernization for the industry Bulletin of BSTU named after V G Shukhov 1 214-218
[10] Lesovik V S, Absimetov M V, Elistratkin M Yu, Pospelova M A, Shatalova S V 2019 For the study of peculiarities of structure formation of composite binders for non-autoclaved aerated concrete Construction Materials and Products 2(3) 41-47
[11] Slabinskaya I A, Benderskaya O B 2017 Sustainability of Belgorod region enterprises of building materials and building structures industry under sanctions Advances in Engineering Research: Proceedings of the International Conference AIME 2017 133 102-107

[12] Slabinskaya I A, Benderskaya O B 2019 Quality of functional stability management of Belgorod food industry enterprises Herald of the Belgorod University of Cooperation, Economics and Law 6 307-321

[13] Slabinskaya I A, Benderskaya O B, Mitrokhin A A, Truhin A S 2015 Methods of Company Financial Stability Monitoring International Business Management 9(6) 1091-1096

[14] Tolstoy A D 2020 Fine-grained high-strength concrete Construction Materials and Products 3(1) 39-43

[15] Usatova L V, Arskaya E V, Budnichenko O 2014 The importance of profit and mechanism of its distribution in modern conditions Belgorod Economic Bulletin 3(75) 175-186

Acknowledgments
This work was realized under the support of the President Scholarship; in the framework of the Program of flagship university development on the base of the Belgorod State Technological University named after V G Shukhov.