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A COMPLEX RATING ASSESSMENT OF THE FINANCIAL POSITION OF RUSSIAN AGRICULTURAL ENTERPRISES: METHODOLOGICAL ASPECTS

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Abstract: The article explores the problems of choosing the key indicators for quantitative assessment of financial state of companies. The methodological aspects of this assessment are examined using the example of agricultural industry. The purpose of the study is to prove the lack of a unified methodology for comparative assessment of financial and economic activities of business entities, taking into account current business conditions and industry specifics. The objectives of the study are to develop a unified methodology for assessing business situation based on nine key indicators provided by the SPARK-INTERFAX system. The economic content of key indicators of rating assessment based on SPARK-INTERFAX system was revealed in detail. The dynamics of sectoral average indicators of pig farms over the past 8 years have been shown. Using statistical methods, it was proved that reference of some key indicators can vary between sub-industries: pig breeding, poultry farming, etc. Therefore, a rating methodology has been developed to evaluate the financial position of enterprises, taking into account

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industry average values, controlled for the regional level. The practical significance of the study was tested at the three largest Russian pig breeding enterprises with the revenue of more than 10,000 million rubles.

Keywords: Comprehensive assessment, rating, financial position, liquidity, business activity, financial stability, profitability.

1. INTRODUCTION

Business performance depends on both external and internal factors. If an economic agent has no influence on the external factors of the macro-environment, then it must at least adapt to the influence of those factors. As for internal factors, the main role belongs to the company's management, since they must promptly analyze all the facts of the economic life and effectively use labor, material and financial resources [14].

How often do managers evaluate the financial position of the company, and how preventive are the measures resulting from this analysis? What indicators should they focus on to make adequate managerial decisions? It is obvious that some enterprises can afford an analytical service to deal with such issues, while others don't have enough resources.

As for agricultural production, it should be noted that most of the enterprises lack such units in their organizational management structure. Given the current market situation, when import substitution becomes the main priority at the State level, further sustainable development of Russian agriculture is of paramount importance. Therefore, a timely analysis of financial position is the most important task for company's management. Moreover, if this analysis is carried out against the "pilot enterprises" of an industry, then the "problem areas" in the company's activity become obvious..

2. METHODS

The works of domestic and foreign scientists on the analysis of financial and economic activities of enterprises are the theoretical background of the current study. The following methods were used: analysis, synthesis, abstract-logical, monographic, economic-statistical methods, methods of systematizing and summarizing the results of the study.

3. RESULTS AND DISCUSSION

complex comparative assessment of the financial position of any economic entity includes the following steps (Figure 1).
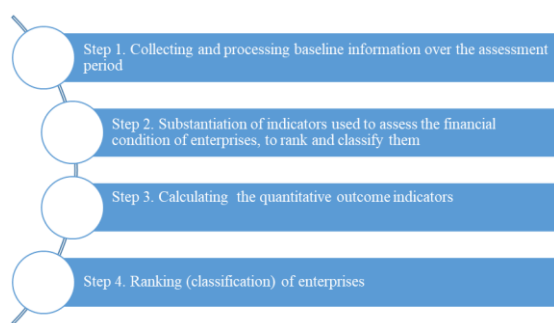
Figure 1. Evaluation of financial position of enterprises [Source - https://afdanalyse.ru/publ/finansovyj_analiz/1/rejtingovaja_ocenka_finansovogo_sostojanija_ predprijatija/16-1-0-213]

The final rating estimations consider all the most important parameters of financial and operating activities: company's production potential, output profitability, efficiency in use of financial resources, the funds sources, position and investment, - i.e. economic activity in general.

The data on the production potential of an enterprise, profitability of its products, the effectiveness of using financial resources, the status and allocation of funds, their sources and other indicators are used in assessment procedure. An accurate and objective assessment of financial position cannot be based on an arbitrary set of indicators. Therefore, the selection and justification of the initial performance indicators should be carried out in accordance with the provisions of the theory of enterprise finance, based on the objectives of the assessment, the needs of management entities in the analytical assessment [11].

The review of economic literature has shown that there is no consensus on the inclusion of specific indicators in the complex rating of enterprises' financial position. One thing remains obvious: these should be indicators characterizing liquidity and solvency, financial stability, business activity and its profitability [5, p. 114]. So, E.A. Markaryan and G.P. Gerasimenko have proposed including instant liquidity ratio, critical liquidity ratio, current liquidity ratio as indicators of financial position of enterprises in rating assessment [1, P.302].

A.O. Nedosekin believes that a comparative assessment of the financial position of economic entities should include such indicators of financial stability as the equity-to-assets ratio, return on investment, interest coverage ratio [7, P. 50]

However, there is general agreement among scientists that profitability indicators (return on sales, return on assets, return on equity) are the primary assessors of financial position of an enterprise [4,5, 8, 9].

In the current study, the main indicators included in the complex rating assessment are provided by the SPARK-INTERFAX system. The "SPARK-INTERFAX" reference and information system makes it possible to compare these indicators calculated for each economic entity not only with industry average values, but also with regional ones.

The SPARK-Interfax platform allows selecting economic entities by types of economic activity and total revenue. The complex rating assessment was carried out on the example of livestock breeding farms and included three largest pig breeding enterprises (more than 10,000 million rubles of total revenue) located in Russia

(industrial classification system OKVED number 01.46).

The calculation of the final rating indicator is based on the comparison of individual financial indicators in the SPARK_INTERFAX system with industry average values adjusted for the regional level. Thus, the rating assessment is based not only on the subjective assumptions of experts, but on the actual results from total activities of compared objects in real market environment. Let us examine in detail what indicators should be included in the rating assessment of economic entities financial position.

1. Let us consider the first indicator - the share of non-current assets. It is believed that the share of non-current assets in the balance sheet of an economic entity should be equal to 50% or higher. Due to industry specifics, agricultural enterprises have their own peculiarities in building and management of non-current assets, presented in Figure 2.
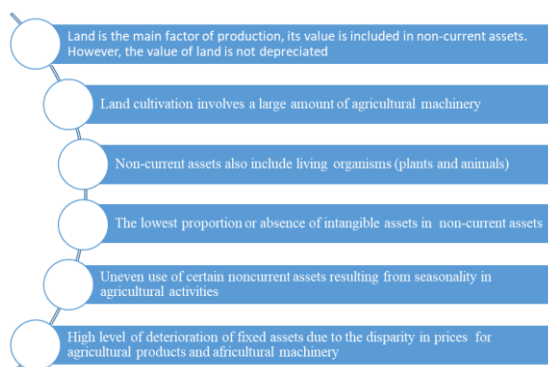
Land is the main factor of production, its value is included in non-current assets. However, the value of land is not depreciated

Land cultivation involves a large amount of agricultural machinery

Non-current assets also include living organisms (plants and animals)

The lowest proportion or absence of intangible assets in non-current assets

Uneven use of certain noncurrent assets resulting from seasonality in agricultural activities

High level of deterioration of fixed assets due to the disparity in prices for agricultural products and africultural machinery

Figure 2 Specific features of non-current assets in the agriculture[Source:

https://cyberleninka.ru/article/n/osobennosti-formirovaniya-i-upravleniya-vneoborotnymi-

aktivami-v-selskohozyaystvennyh-predpriyatiyah/viewer]

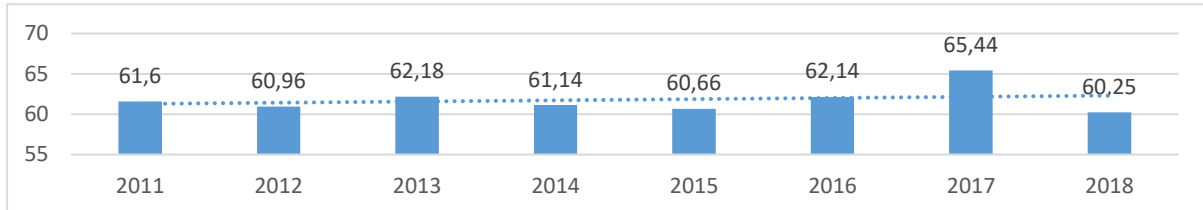Figure 3 shows the dynamics of changes in the share of pig farms non-current assets.

Рис. 3. Dynamics of changes in the share of non-current assets of pig farms (OKVED

01.46), % [compiled by the authors based on the data from "SPARK_INTERFAX" system]

As can be seen from Figure 3, the trend line indicates an increase in the share of non-current assets included in the property of livestock enterprises. The highest level was achieved in 2017, when it amounted to 65.44%, and the lowest level (60.25%) was fixed in 2018.

2. The equity-to-assets ratio is one of the most important indicators of financial independence of any economic entity, determining the proportion of equity in a company's assets, i.e. what share of assets are owned by company's investors. This indicator is very important for investors and lenders who make significant management decisions.
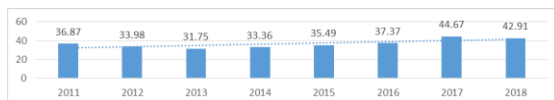

Figure 4. Dynamics of equity-to assets ratio in pig farming (OKVED 01.46), %[compiled by
the authors based on the data from «SPARK_INTERFAX»].

As can be seen from Figure 4, the ratio tends to increase, but the recommended value of 0.5 is still not achieved in the analyzed period.

3. The quick ratio is an indicator characterizing the degree of company's solvency calculated as the ratio of cash and cash equivalents, short-term financial investment and receivables to current liabilities. This indicator is often called the "acid test ratio", since it characterizes

company's ability to extinguish its current obligations in critical situation.

The recommended range of this ratio is within 0.7 and 1. However, the structure of the numerator should also be taken into account. If the lion's share belongs to accounts receivable, which have less liquidity, then a greater ratio of a numerator to denominator will be required[11].
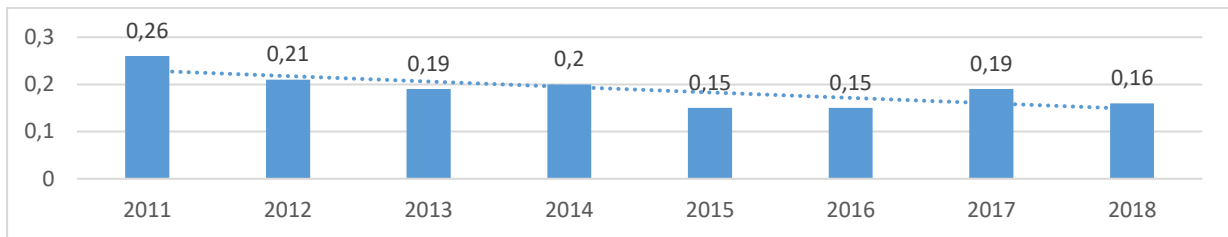

Figure 5. Quick ratio dynamics in pig farming (OKVED 01.46), %

[Compiled by the authors based on the data from «SPARK_INTERFAX»]

The SPARK-INTERFAX system calculations also take into account VAT on purchased goods and other current assets. Thus, Figure 5 shows that in the period from 2011 to 2018, there was a decline in the industry's quick ratio and the recommended ratio range was not obtained.

4. The inventory turnover period (in days) can be considered as an indicator of a company's business activity, as it shows the efficiency of inventory management. Typically, it is calculated as the ratio of the average annual inventory multiplied by the number of days in a year to the cost of production. This indicator shows the number of days of keeping inventories in stock.
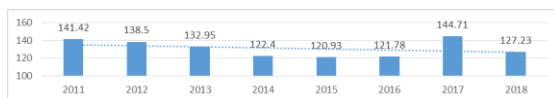

Figure 6. Inventories turnover period in pig farming (OKVED 01.46) [Compiled by the authors based on the data from «SPARK_INTERFAX»]

The value of this indicator depends on industry specifics of company's activities. Thus, for industrial enterprises this period ranges within 45 and 80 days, for trade organizations –within 20 and 45 days, due to the seasonality of agricultural production, but in agricultural enterprises the inventory turnover period lasts from 60 to 120 days on average [2, 12].

As can be seen from Figure 6, the inventory turnover decreases in the analyzed period, and it is a positive trend, although it goes outside the recommended range. It should be noted that inventory turnover varies greatly even between the sub-sectors of livestock breeding. Thus, in poultry farming it is at the level of 80 days on average, and for cattle breeding
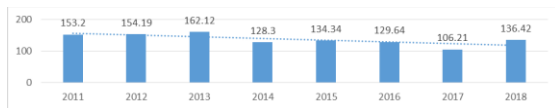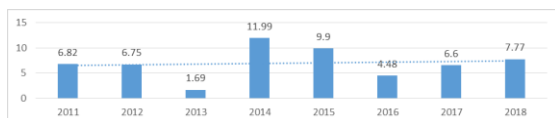
companies it reaches 250 days. This is due to the difference between the periods of growth and maturation of young cattle and poultry.

5. The turnover of funds characterizes the effectiveness of a company's credit policy, i.e. the effectiveness of receivables management. The indicator is calculated as the ratio of average annual amount of receivables multiplied by the number of days in a year to the enterprise revenue. The normal range goes up to 75 days for food and processing enterprises, and up to 30 days for trading enterprises, however, in agriculture the funds turnover period may take up to 75 days.

Рис. 7. Accounts receivable turnover (days) in pig farming (OKVED 01.46) [Compiled by the authors based on the data from «SPARK_INTERFAX»].

As can be seen from Figure 7, the accounts receivable turnover (days) has shown a downward trend in the previous 8 years, which is undoubtedly a positive point. However, this indicator is twice the upper recommended value for agricultural enterprises.

6. Return on assets (for accounting profit) demonstrates how effective the utilization of assets is, i.e. it shows accounting profit per 1 ruble of assets. It should be noted that there are no established standards for this indicator, so let us consider it in dynamics (Figure 8).

Figure 8. Return on assets (for accounting profit) dynamics in pig farming (OKVED 01.46), % [Compiled by the authors based on the data from «SPARK_INTERFAX»]

As can be seen from figure 8, the return on assets has been increasing in the analyzed period. The highest level of this indicator was achieved in 2014, when it amounted to 11.99%, and the smallest - in 2013 when it was at 1.69%.

7. The profitability of all operations (for accounting profit) is the ratio of accounting profit to taxable income.

This is a kind of sales profitability calculated on the basis of profit before tax. But it is worth accepting the viewpoint of SPARK-INTERFAX system developers, that the calculation of this indicator for accounting profit rather than net profit is more useful to compare the enterprises position.
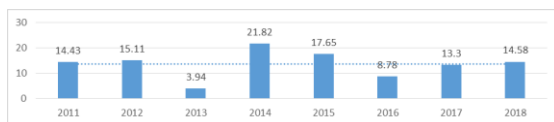

Figure 9. The profitability of all operations in pig farming (OKVED 01.46), % [Compiled by the authors based on the data from «SPARK_INTERFAX»]

The Figure 9 shows that despite significant fluctuations in this indicator over the past eight years, the return on sales calculated based on accounting profit remained at about the same level and averaged 13.7% for pig breeding enterprises.

8. Return on equity (for accounting profit) is calculated as the ratio of accounting profit to the company's equity, characterizing the effective use of invested capital.
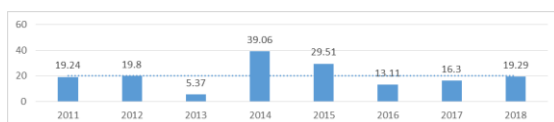

Figure 10. Return on equity dynamics (for accounting profit) in pig farming (OKVED 01.46), % [Compiled by the authors based on the data from «SPARK_INTERFAX»]

As can be seen from Figure 10, the trend line of this indicator is constant and practically unchanged, despite significant fluctuations in 2013 and 2014. On the whole, the average return on equity (for accounting profit) in pig-breeding enterprises was at 20.21% over the previous 8 years.

9. The industry average level of net working capital (in % of revenue) is one of the most interesting indicators in the SPARK-INTERFAX system. "Quinto-Consulting" specialists L.Ruslanova, O. Efremova, V. Saluna and Yu. Shkolnikova took part in the development of its calculation technique. This indicator represents the ratio of the average annual value of current assets less short-term liabilities to sales proceeds. It plays a key role in determining the total value of the enterprise.
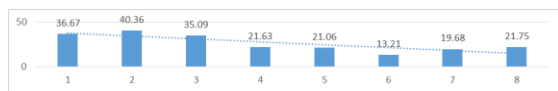

Figure 11. The industry average level of net working capital (in% of revenue) in pig farming (OKVED 01.46), % [Compiled by the authors based on the data from «SPARK_INTERFAX»]

As can be seen from Figure 11, in recent years there has been a downward trend in this indicator. The industry average level of working capital in% of revenue amounted to 26.18% for the analyzed pig breeding enterprises.

The initial data for ranking the financial position of three largest pig breeding enterprises are presented in table 1.

Table 1. Initial data for ranking the financial position of agricultural enterprises

Indicator	LLC "TAMBOVSKIY BACON"		LLC "TCHERKIZOVO –PIG PRODUCTION"		CJSC "SK KOROCHA"	
	Company's indicator	Tambov region average indicator	Company's indicator	Lipetsk region indicator	Company's indicator	Belgorod region indicator
The share of non-current assets	74	73,85	63	63,27	19	19,14
Equity-to-Assets ratio, %	63	63,03	27	26,52	4	4,25
Quick ratio	0	0,28	1	0,55	1	0,89
Inventory turnover (days)	138	137,69	138	137,83	14	13,73

Accounts receivable turnover (days)	31	31,48	70	70,06	287	287,16
Return on assets (for accounting profit)	15	15,05	16	16,13	-1	-1,46
Profitability of all operations (for accounting profit)	24	24,02	23	22,52	-2	-1,50
Return on equity (for accounting profit)	30	29,89	51	51,1	-31	-30,96
The industry average level of working capital (in % of revenue).	-1	-0,60	6	6,32	-3	-3,34

In general, the algorithm for a comparative rating of enterprises financial position can be represented as a sequence of the following actions.

1. Initial data are presented in the matrix (aij), where the indicators numbers are in rows (i = 1, 2, 3 … n), and enterprises' numbers are in columns (j = 1, 2, 3 … m).

2. The initial matrix indicators are standardized in relation to the industry and regional levels using the following formula:

$$x_{ij} = \frac{a^2_{ij}}{a_{cp.omp.} \times a_{регион.}}$$

(1)

where xij are standardized indicators of financial position of i-enterprise

a_{ij} - i-indicator of financial position of j-enterprise;

$a_{cp.omp.}$ - industry average indicator;

$a_{регион.}$ - regional indicator.

4. For each enterprise, the rating is determined using the following formula:

$$R_j = \sqrt{\sum x_{ij}}$$

(2)

where Rj is the rating evaluation of j-enterprise;

x1j, x2j, …, xnj are standardized indicators of j-enterprise.

5. The enterprises are ranked in descending order.

Table 2. The rating evaluation of the financial status of 3 largest pig breeding enterprises in Russia .

Indicator	Industry average (OKVED 01.46)	LLC "TAMBOVSKIY BACON"		LLC "TCHERKIZOVO –PIG PRODUCTION"		CJSC "SK KOROCHA"	
		x	Regional indicator	x	Regional indicator	x	Regional indicator
The share of non-current assets	61,80	1,200	73,85	1,015	63,27	0,305	19,14
Equity-to-Assets ratio, %	37,05	1,700	63,03	0,742	26,52	0,102	4,25
Quick ratio	0,19	0,000	0,28	9,569	0,55	5,914	0,89
Inventory turnover (days))	131,24	3,300	137,69	0,950	137,83	9,193	13,73
Accounts receivable turnover (days)	138,05	0,221	31,48	1,974	70,06	0,000	287,16
Рентабельность активов (по балансовой прибыли)	7,00	2,136	15,05	2,267	16,13	-0,098	-1,46
Return on assets (for accounting profit)	13,70	1,750	24,02	1,715	22,52	-0,195	-1,50
Return on equity (for accounting profit)	20,21	1,490	29,89	2,519	51,1	-1,536	-30,96
The industry average level of working capital (in	26,18	-0,064	-0,60	0,218	6,32	-0,103	-3,34

% of revenue).							
Total xij	x	11,733	x	20,968		13,583	x
$R_j = \sqrt{\sum x_{ij}}$	x	3,425	x	4,579		3,685	x

The enterprise with the maximum comparative assessment value calculated using the Rj formula is ranked first.

However, it must be taken into account that an increase in value is not always positive for all the established indicators, it's negative for the inventory

The calculation of rating indicators is presented in table 2. Thus, a rating evaluation of the financial position of three largest pig breeding enterprises has shown that Cherkizovo-PIG BREEDING LLC is ranked first in terms of solvency, financial stability, and profitability, it is followed by SK KOROCHA, and the third place is held by LLC Tambovskiy Bacon.

4. Discussion

The various methods of complex rating assessment were developed at the end of the 1990s and were focused on comparing economic entities with reference enterprises. The reference parameters were subjective in

and accounts receivable turnover (days). For any i-enterprise, they are calculated as follows:

$$x_{ij} = \frac{a_{cp.отр.} \times a_{регион.}}{a^2_{ij}}$$

(3)

their nature due to the inability to analyze the general population of enterprises by industry [13]. In the modern world, new technological abilities for analyzing a huge amount of data have appeared with the advent of Big data. Due to this fact, the authors of the current study have attempted to develop a unified methodology for assessing the financial position of enterprises. The developed methodology needs further improvement, since it requires establishing weighting coefficients of significance for each key indicator.

5. Conclusions

The rating assessment of the financial position of enterprises helped

detect problems in organizing production and economic activities of any economic entity. It allows to outline the prospects for future management decisions. For example, to improve the liquidity and solvency of companies, it is necessary to optimize the structure of assets and liabilities, to improve payment discipline in order to prevent cash gaps. And to increase business activity, improving the credit and marketing policies of the enterprise is required.

The review of economic literature has shown that there is no single opinion among scientists about the inclusion of certain indicators of financial and economic activity of enterprises in the rating assessment of their financial position. However, there is neither no standardized rating methodology suitable for all economic entities in various agricultural sub-sectors [6,15].The current study sought to unify the methodologies on the basis of the SPARK-INTERFAX platform, which provides tremendous opportunities to obtain a large volume of the sample population depending on the types of economic activity and the revenue of economic entities. Based on the industry average, regional and individual values provided by SPARK-

INTERFAX for nine key indicators characterizing liquidity, business activity, financial stability and profitability of economic entities, a rating assessment methodology has been developed.One of the advantages of this technique is the comparison of main indicators not with a reference enterprise, but with the actual industry and regional average indicators.

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