Approaches to Forming the Rating of Automotive Industry Enterprises Based on Financial Statements

N B Akulenko¹, A R Esina¹

¹Ph.D., Associate Professor
in the Department of industrial Economics
Plekhanov Russian University Of Economics

E-mail: akulenkonb@yandex.ru, allache@mail.ru

Abstract. The article presents the results of developing a methodology for rating the enterprises of the automotive industry. The tasks formulated in the Consolidated Strategy for the Development of the Manufacturing Industry require an increase in innovation activity and the development of the export potential of enterprises in the automotive industry. The formation of a monitoring system for this sector of the economy will contribute to the achievement of the planned indicators. A review of the rating methods used in practice has shown that most of them are based on the assessment of traditional areas, including the level of business activity, profitability, and financial condition of enterprises. With regard to high-tech enterprises the ratings cover a limited number of organizations, due to the specifics of the information used and the declarative nature of participation. The methodology developed by the authors for rating enterprises in the automotive industry is based primarily on taking into account the innovative component of organizations’ activities. For these purposes, a system of indicators based on information reflected in the financial statements of enterprises has been proposed, which increases the objectivity of the results of comparative analysis and allows it to be used for mass valuation of enterprises.

1. Introduction
The reduction in external demand, which has a significant impact on the raw materials sector of industrial production, inevitably leads to the obvious fact that today the main driver of the growth of Russian industry is and should remain the “manufacturing sector”.

In connection with the trends that have developed in recent years in the world commodity markets, in 2019, Russia’s exports decreased by 6.04% compared to 2018. Despite all the efforts made, there were no significant changes in the structure of exports. The dominant share is steadily occupied by mineral products, in 2019 their share was 63.33% [1].

At the same time, a downward trend is observed, which is associated with the situation on the oil and gas market and with the general decline in business activity in the world. As a result, in the first half of 2020, the share of mineral products in Russian exports decreased to 56.15%. For comparison, the share of machinery and equipment was only 3.43% in 2019, rising to 4.86% in the first half of 2020. [2].

At the same time, it is noteworthy that the share of manufacturing in gross value added exceeds the share of the raw materials sector. In 2019, it amounted to 14.6%, while the share of the raw materials sector was 12.6% [3].
In these conditions, support for industrial production in general and the manufacturing sector, in particular, is in the focus of government attention. Confirmation is the development and approval of the "Consolidated strategy for the development of the manufacturing industry of the Russian Federation until 2024 and for the period up to 2035" (approved by order of the Government of the Russian Federation No. 1512 of June 6, 2020) [4].

According to the Consolidated Strategy, export is considered as the main direction of the development of industrial policy in the interests of solving problems of import substitution. At the same time, it is planned to stimulate research and development work and their subsequent implementation, supporting the internal technological activity of industrial entities, and promoting the use of the best available technologies.

The document notes that the most modern industries, which are actually recreated on the basis of competitive technologies and solutions, include the automotive industry. As target indicators of the development of the industry, it is planned to achieve by 2035 the volume of production of passenger cars-2.38 million units, trucks -117.08 thousand units. The growth rate of electric vehicles and unmanned vehicles should be 40-50 percent per year, which is in line with global trends «the adoption of electric vehicle» [5].

With the increasing trend of economic globalization, the market competition among enterprises is becoming increasingly fierce [6]. Nevertheless, the products of Russian automotive companies are quite competitive in the domestic market, which is confirmed by the structure of car sales in 2019 (Fig. 1).

![Figure 1. The structure of car sales in the Russian market in 2019 [7].](image)

The largest market segment, which accounts for 60% of all new passenger car sales, is foreign cars made in Russia. In 2019, their sales decreased by 4.7%, determining the overall dynamics of the new passenger car market. One of the main reasons was the rise in the price of cars in the segment by almost 16%. Price determination is «a standing problem for car manufacturers» not only in Russia, but, for example, in South Korea [8].

In general, at the end of 2019, sales of passenger cars decreased and amounted to 1,631 thousand units, which is 2.3% lower than sales in 2018. This trend has continued into 2020. According to the Association of European Businesses for 5 months of 2020 the Russian car market decreased by 25.7%.

According to the stress scenario developed by PwC, taking into account the recovery and stabilization of oil prices by the third quarter of 2020 and the removal of most restrictions on the movement and activities of enterprises in late spring - early summer 2020, the volume of passenger car sales in the Russian market in the current year will decrease by 29.8%.

This dynamics is explained by a number of objective reasons:
- "falling business activity in the world "[9] due to the spread of COVID-19;
- a decrease in consumer activity of the population, accompanied by a decrease in demand for manufacturing products, with the exception of food and production of medicines and materials;
- the high dependence of Russian enterprises on the supply of components by foreign partners, primarily from China;
- «falling oil prices» [10] and the weakening of the ruble, as a result, the rise in the cost of supplies of components, which, given the relatively low profitability of products in manufacturing, leads to an even greater decrease in profits and increases the risk of losses for enterprises, and also forces manufacturers to raise prices for products.

In connection with the current situation, the government has included the largest automobile manufacturing companies in the list of strategic enterprises for the purpose of operational monitoring of their financial condition.

Based on the goals set for the industry in accordance with the Consolidated Strategy for the Development of the Manufacturing Industry the task of forming a mechanism for monitoring the functioning of automotive enterprises in order to analyze the degree of achievement of the planned indicators and assess the effectiveness of state support measures for this sector is of particular relevance. World practice has experience in developing such tools. For example, Chinese economists in their work «develops a system dynamics (SD) model to describe the feedback relationship among subsidy policies, EVs sales, and the uptake of EVs» [11].

1.1 Analysis of existing approaches to a rating estimation of activity of the enterprises

The sustainable functioning of enterprises is the result of taking into account in the management process the entire set of factors that determine the effectiveness of economic entities, which requires quantitative measurement of parameters that characterize certain aspects of their activities, and the use of tools to control these parameters [12]. A number of scientists distinguish «factors causing dynamics in entrepreneurial ventures, their duration and process rate depend on environmental conditions, including institutional, market, infrastructure, and resource aspects» [13].

The principles, methods and approaches to a comprehensive analysis of economic entities depend on the purposes for which it is planned to use its results and what solutions are expected to be made based on the information received, which is determined primarily by the interests of various groups of users at both the micro- and macro levels.

Express diagnostics is a preliminary stage of analysis of the company's activities. It is carried out mainly on the basis of data from financial and statistical reports of enterprises and allows you to get a general assessment of the level of efficiency of their functioning, without the detailed influence of factors that affected the performance indicators [14]. It is most often used for comparative analysis.

A comparative assessment of economic entities is necessary for positioning an enterprise in a competitive environment [15], determining the viability of enterprises and identifying reserves for increasing the efficiency of activities, as well as forming a system for monitoring parameters characterizing the functioning of an economic entity. Comparative analysis allows you to quickly «detecting unwanted deviations» [16] in the activities of enterprises and take timely measures to eliminate them, as well as adjust the business development strategy [17].

It should be noted that rating analysis is most widely used in the field of assessing the financial condition of organizations. This direction is widely studied in the literature on economic analysis, in the works of such authors as: Shermet A.D., Kazakova N. A., Savitskaya G. V., and others [18,19,20].

In these works, the approaches are unified and the main stages of rating assessment are defined, including:
- collection and analysis of initial information in order to determine homogeneous groups of enterprises subject to rating assessment;
- formation and calculation of a system of indicators used for assessment purposes;
- calculation of integral indicators and ranking of enterprises by rating level [18].

At the same time, there is no single methodology for rating analysis. The differences are manifested, first of all, in the selection of indicators used for rating assessment, methods of their standardization.
tion [21], as well as in the choice of the algorithm for calculating the integral indicator. So, Italian scientists «analysis based on customer size, processes, knowledge, and corporate finance, synthesized with balanced scorecard methodology, allows us to estimate the resilience of companies in a period of crisis» [22]; Korean scientists «investigate the effects of the level and changes in environmental, social and corporate governance (ESG), an index developed to represent a firm's» [23]; Chinese scientists use «the method of intuitionistic fuzzy analytic hierarchy process (IFAHP) is adopted for evaluation» [24]; domestic scientists offer «method is based on accounting data, available in information databases and allows evaluating business success rating for any company in any sample, including statement of the success level of enterprise» [25]; Czech scientists conduct empirical research, «including data from 312 SMEs in the CR and 329 SMEs in the SR processed with the use of Chi-squared tests and Z-scores. » [26]; Polish scientists are conducting research «using arithmetic means, Pearson correlation coefficients and Chi-squared test» [27]. Panfilova N.E., Tikhonov A.I. and Savin A.I. in their research «when processing the analytical material, statistical methods of summarizing, grouping, comparing, as well as methods of a systematic approach, complex analysis, and calculation of the arithmetic mean were used» [28].

It should be noted that from the point of view of the rating assessment of the financial condition of the enterprise, the task of forming a system of indicators is simplified, since developed standardized approaches to the areas of financial analysis and algorithms for calculating indicators based on the reporting forms used for these purposes [29]. As a rule, most authors in Russian practice use the information capabilities of two main forms of reporting: the balance sheet and the report on financial results. At the same time, there are significant differences in the reflection of indicators in these forms. The balance sheet presents moment indicators that characterize the value of property and sources of its formation at the beginning and end of the reporting and previous periods. The statement of financial results contains interval indicators reflecting the amount of income, expenses and profit for the reporting and previous periods.

For the purposes of rating assessment, absolute reporting indicators are most often transformed into relative indicators: liquidity, financial stability, profitability and turnover of funds.

There is no doubt that the basis for determining the directions of rating assessment and the formation of a system of indicators should be the maximum consideration of the specifics of the activities of enterprises based on the capabilities of financial reporting.

In this regard, the development of a methodology for the formation of a rating of high-tech industrial enterprises is of particular interest, since the formation of an innovative model of economic growth and the tasks of implementing the "Consolidated strategy for the development of the manufacturing industry" require close attention to this sector of industrial production and monitoring its dynamics.

There is experience in forming such ratings. An example is the TechUspekh rating, conducted by JSC “RVK” (AO «PBK») together with partners since 2012 [30]. The purpose of the rating is to search, monitor and promote promising fast-growing technological organizations that have a high leadership potential, both in the Russian and global markets.

Since 2016, the results of the rating have been used to search for and select companies for participation in the priority project of the Ministry of Economic Development of Russia “Support for private high-tech companies-leaders” (“National Champions”). The rating methodology was compiled by OOO PricewaterhouseCoopers Consulting (PwC), for OJSC (OAO) Russian Venture Company, in order to form a rating of fast-growing high-tech Russian companies within the framework of the TechUspech Rating.

According to the rating methodology, companies are divided into three groups according to the criterion of the amount of revenue: small, medium and large.

For rating purposes, three indicators are used: the revenue growth rate over the last three years, the level of innovation and export potential. In this case, a point assessment of the criteria is used.

The following features of this rating can be distinguished:
- focusing mainly on the “innovative activity of organizations” [31];
- the selection of companies for the formation of the rating is carried out by questioning the participants, i.e. companies independently fill out a questionnaire containing quantitative and qualitative questions, on the basis of which the participant's compliance with the qualification requirements is determined;

- quality parameters are evaluated by experts.

Copies of the balance sheet, report on financial results are attached to the questionnaire.

A feature of the TechUspekh rating is the lack of a comprehensive assessment of the efficiency of companies' functioning.

The declarative way of participating in the rating and the nature of the information used means that it covers a limited number of organizations.

A certain degree of subjectivity of the information used does not allow to form an objective assessment, which is also noted in the works of foreign authors in relation to the analysis of the activities of high-tech enterprises. So, for example, due to the inaccuracy and uncertainty of various messages, the assessment of the effectiveness of servicing airlines is a fuzzy multi-criteria decision-making problem (FMCDM) for management [32].

These features mean that the results of the rating cannot be used for the purpose of mass rating assessment of enterprises in the high-tech sector of the economy, but they are not disadvantages of the rating, since it is carried out for other purposes.

Nevertheless, the task of forming a rating in order to monitor the functioning of high-tech industrial enterprises, which include a car-building, is more urgent than ever in the field of tasks facing the Russian economy, the main of which is increasing the level of its competitiveness.

1.2. Formation of a rating of automotive industry enterprises based on financial reporting data

In order to develop and test a methodology for forming a rating of automotive enterprises, four enterprises were selected, included in the list of system-forming enterprises in the sphere of the Ministry of Industry and Trade of Russia:

1. PJSC "GAZ"
2. JSC "Automobile plant" Ural "
3. LLC "PSMA RUS"
4. PJSC "AVTOVAZ"

Based on the goals of the rating assessment, the needs of management entities, as well as taking into account the specifics of the activities of high-tech enterprises, three main directions for assessing the activities of high-tech enterprises were identified on the basis of financial statements [33]:

- business activity and profitability of activity;
- innovation and investment activity;
- financial condition.

The business activity of the enterprise is characterized by the breadth of sales markets and the growth rate of sales, as well as the rate of turnover of funds. It depends, first of all, on the level of competitiveness and demand for the company's products. Stable receipts and growth of proceeds from sales are evidence of the demand for the company's products on the market and a guarantee of the rhythmic work of an economic entity.

Profit is the final result and the main source of self-financing of the activities of enterprises. From the point of view of comparative assessment, it has a significant drawback - dependence on the size of the enterprise.

Profitability is a universal indicator that allows you to compare enterprises of different sizes and reflects the level of use of resource potential, as well as management efficiency. Ultimately, this indicator is an indicator of the investment attractiveness of the enterprise.

Innovation and investment activity is the foundation of the competitiveness of high-tech enterprises, since the specifics of their activities are associated, first of all, with the use and creation of innovations.
Financial condition is a complex characteristic, which is the result of the level of management of production, economic and financial activities of an enterprise and the efficiency of resource use. The financial condition is the basis for the sustainable functioning of the enterprise and a guarantee of the fulfillment of obligations to counterparties and the budget.

According to the selected areas, a system of indicators was formed, used for the purposes of rating assessment [33].

The system included, among other things, tempo indicators, i.e. dynamics indicators (table 1).

**Table 1. System of initial indicators used for rating assessment.**

| Indicator name | Significance of the indicator |
|----------------|-------------------------------|
| **1. Indicators of business activity and profitability** | |
| 1.1 Sales revenue growth rate, % | 0.22 |
| 1.2 Return on sales based on sales profit, % | 0.16 |
| 1.3 Return on assets based on EBIT, % | 0.14 |
| **2. Indicators of innovation and investment activity** | |
| 2.1 Share of intangible assets in non-current assets, % | 0.1 |
| 2.2 Share of research and development results in non-current assets, % | 0.09 |
| 2.3 The growth rate of payments in connection with the acquisition, creation, modernization, reconstruction and preparation for the use of non-current assets, % | 0.11 |
| **3. Indicators of financial condition** | |
| 3.1 Coefficient of provision of current assets with own funds, coefficient. | 0.08 |
| 3.2 Current liquidity ratio, coefficient. | 0.1 |
| Total | 1.0 |

The period from 2015 to 2019 inclusive was defined as the period for researching the activities of enterprises. The introduction of economic sanctions in 2014, first of all, was directed and negatively affected the activities of high-tech enterprises in the industrial sector of Russia. This period makes it possible to assess the efficiency of the functioning of high-tech industrial enterprises in the context of economic sanctions, as well as the effectiveness of the implementation of the import substitution policy proclaimed by the Russian government. The rating was calculated based on the average annual indicators.

In the study period, all enterprises showed a fairly high average annual growth rate of sales revenue. At the same time, revenue growth was observed against the background of low profitability of sales. PSMA RUS LLC showed unprofitable sales in 2019.
Return on assets, calculated on the basis of EBIT (earnings before interest and taxes), was positive for all enterprises, due to significant interest payments on loans. All surveyed enterprises had a low level of financial independence, the average share of borrowed funds was in the range of 68-78% and showed growth dynamics.

In order to assess the innovation and investment activity of enterprises, the data of two reporting forms were used: the balance sheet and the cash flow statement.

The first section of the balance sheet "Non-current assets" contains two items that directly reflect the innovative activity of enterprises.

First of all, these are intangible assets resulting from the use of intellectual capital and the competitive advantages of an organization. For the enterprises under study, they included: inventions, utility models, industrial designs and trade marks.

The second article is the results of research and development, i.e. the costs of the enterprise associated with the implementation of research, development and technological work, which gave a positive result, but at the same time are not related to intangible assets. In this case, these works can be carried out by the enterprise or carried out with the involvement of third-party organizations under a contract.

In general, Russian enterprises are characterized by a low share of intangible assets (less than 1%) in non-current assets. Unfortunately, this level was also observed in the high-tech enterprises under study, which does not allow us to note a high level of innovation activity. The most significant share of intangible assets in non-circulating assets was observed in JSC “Avtomobilny zavod “Ural” (0.038%).

![Figure 2. Indicators of business activity and profitability 2015-2019.](image-url)
It should be noted that the balance sheet of PSMA Rus, a joint venture of PSA Group (70%) and Mitsubishi Motors Corporation (30%), does not contain data on the item "research and development results", and under item "intangible assets" the lowest of the studied enterprises, which confirms the fact that the results of intellectual property are not transferred to enterprises established on the territory of Russia, and they do not conduct research and development.

In order to assess the financial condition, two coefficients were selected:
- current liquidity ratio, reflecting the coverage of short-term liabilities by current assets;
- the ratio of the provision of current assets with own funds, which characterizes the ability of an enterprise to finance its current activities, i.e. current assets at the expense of own funds.

The analysis showed the lowest level of financial stability and solvency of JSC AVTOVAZ. The best financial condition was observed in JSC “Avtomobilny zavod “Ural ”. Despite the unprofitable sales, a fairly high level of solvency in comparison with other enterprises was observed in PSMA RUS LLC. The values of the current liquidity ratios in GAZ PJSC were significantly lower than the recommended level.
In order to calculate the integral indicator of the rating assessment, the method of sums was used. With this approach, for evaluation purposes, unidirectional indicators are used, the growth of which is assessed as a positive trend.

The ranking of enterprises according to the level of the integral indicator obtained as a result of calculations is presented in Figure 5.

![Figure 5. Ranking of automotive enterprises by the level of the integral indicator.](image)

The results of a comprehensive express diagnostics of the efficiency of the functioning of four enterprises of the automotive industry showed that the enterprise of JSC “Automobile Plant” Ural became the leader, which was achieved due to the profitability of activities and innovative activity. As already noted, out of 4 enterprises, 3 had sales profitability in 2019. At the same time, the average profitability of sales of JSC “Automobile plant” Ural in the period under study was more than 2 times higher than in PJSC “GAZ”. At AVTOVAZ, the level of return on sales was extremely low (0.794%). As noted above, the sales of PSMA RUS LLC in 2019 were unprofitable. There was no significant gap in terms of innovation activity and financial condition. Closes the rating of JSC "AVTOVAZ", which is a natural consequence of the low level of profitability and the unstable financial condition of the enterprise.

2. Conclusions

In general, the results of the rating showed low efficiency of functioning of the studied enterprises of the automotive industry in all areas of activity, including innovative activity.

Global trends and specific Russian factors have a significant impact on the automotive industry. First of all, this is due to the acceleration of the development of technologies, including the creation of electric and autonomous cars, the tightening of environmental standards, the implementation of joint technological projects in the field of automobile construction. Consumer preferences are changing, which is reflected in increased requirements for the economy, reliability and comfort of automotive products. For Russian enterprises, a significant factor is the high dependence on the supply of components by foreign contractors.

State support measures for the automotive industry, including the impact on market demand, inspire reason for optimism. Nevertheless, constant monitoring of this sector is necessary in order to assess the effectiveness of government regulation measures.
The use of the developed methodology for rating enterprises allows performing control functions, identifying problem "zones" and developing measures to improve the efficiency of enterprises.

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