

Technology for Determining the Effectiveness of the State Industry Development Program



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Abstract: *The analysis of the state program "Development of the aviation industry 2013-2025" is carried out. A set of program targets is being studied. A methodology for assessing the effectiveness of the implementation of state programs of the Russian Federation, which is used to prepare sections of the consolidated annual report, is considered. The analysis of the development of the aviation industry. The problems of assessing the effectiveness of the implementation of the state development program are highlighted. The article presents the results of the analysis of the relationship of gross domestic product, target indicators, and performance indicators of the state program "Development of the aviation industry 2013-2025." The expected results of the implementation of the state program are substantiated, discrepancies in the results of implementation from the expected results of the program are identified. A technology is proposed for determining the effectiveness of the state program, taking into account the technological, material, technical, innovative, personnel development of the industry. The results of the analysis can be used in the process of evaluating the effectiveness of implementation and planning of state development programs.*

Keywords: *state program, target indicators, industry, analysis of indicators, efficiency, socio-economic development, competitiveness, correlation, profitability, technological, innovative, material and technical, personnel development.*

I. INTRODUCTION

Currently, in accordance with the concept of long-term socio-economic development of the Russian Federation, the Government of the Russian Federation dated April 15, 2014 No. 303 approved the state program "Development of the Russian aviation industry for 2013 - 2025". The responsible executor is the Ministry of Industry and Trade. This program is part of the program block of state programs in the field of innovative development and modernization of the economy. Within the framework of this area, it is planned to implement measures that will not only allow the Russian Federation to create a competitive high-tech economy.

But conditions will also be created for the mass emergence of new innovative companies in all sectors of the economy, and especially in the field of knowledge economy. It is also planned to create an extensive transport network that provides a high level of interregional integration and territorial mobility of the population. [1,2].

In addition, in the process of implementing the program, it is planned to strengthen Russia's position in the integration processes in the Eurasian space by establishing Russia as a center for world economic relations and building balanced multi-vector economic relations with European, Asian, American and African economic partners. [2,3,4]

Objective: to conduct an analysis of approaches and develop a technology for determining the effectiveness of the state industry development program.

Literature review

Existing methodologies for assessing the effectiveness of government programs are based on the approaches to assessing effectiveness that have developed in world practice. First of all, they are based on the analysis of revenue, profit, profitability, productivity. These questions are devoted to the work of Barmashova L.V., Dubrova T.A., Magomedova R. Sh., Muromtseva Yu.L., Eleneva Yu.Ya. [1,2,4]. However, in world practice there is no methodology for determining the effectiveness of a state program, taking into account the assessment of the correlation of program indicators between themselves and macroeconomic parameters. Existing methods do not take into account the technological, material, technical, personnel development of the industry

II. METHODS

The analysis showed that the main goal of the program "Development of the aviation industry for 2013-2025" is to create competitive domestic-made aircraft to meet the needs of domestic transportation with an increase in gross value added in the aircraft industry by 3.5 times compared to 2013. [3]

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Program Objectives:



Fig. 1 Objectives of the state program “Development of the aviation industry for 2013-2025” [1,2,5].

To solve the tasks the following main measures have been developed:

- State support for Russian aviation industry organizations.
- Implementation of research and development work.
- Scientific and analytical support for the implementation of the state program.

In 2016, the World Economic Forum in Geneva emphasized the role of Globalization in the Fourth Industrial Revolution, as one of the key megatrends in the formation of scientific, geopolitical, socio-economic and technical and technological structures for interaction and development of the world community. In this regard, national systems are actively integrating into the global processes of development

of society as a whole, and are focused on international results. Therefore, in the Program it is necessary to take into account indicators characterizing the effectiveness of access to the international global aviation market. This will increase labor productivity, achieve high results in the most priority trends in industrial development and create a competitive product at the state level. [1,2,3,4,5]

An analysis of these tasks leads to the conclusion that it is necessary to develop a methodology for assessing the effectiveness of “promoting the development and promotion of aircraft engineering in aircraft construction, helicopter industry, engine building, aircraft assemblies and instruments”, as well as a methodology for assessing “integrated development of the industry”.

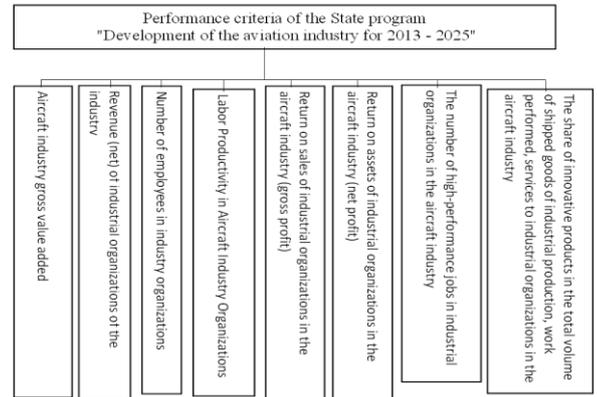


Fig. 2. Performance criteria of the state program “Development of the aviation industry for 2013 - 2025”

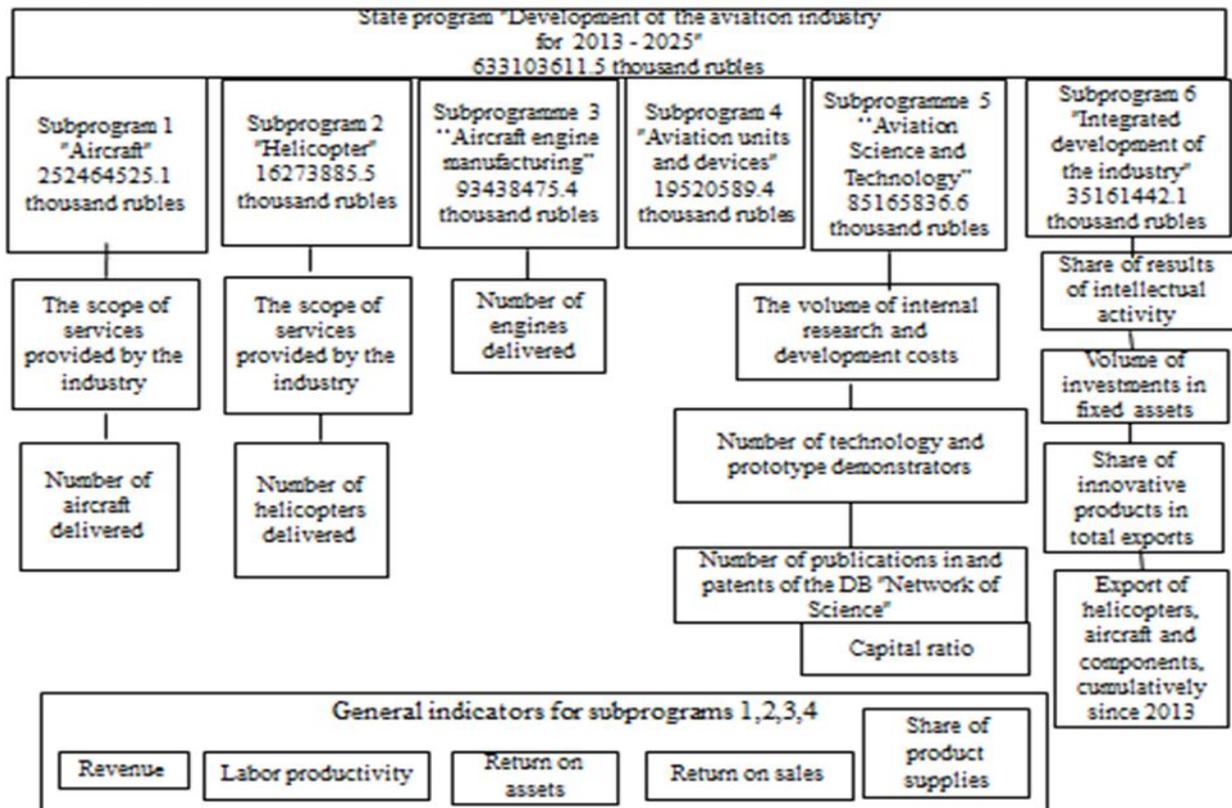


Fig. 3. Analysis of indicators of the subprograms of the program "Development of the aviation industry for 2013-2025." [1,6,12]

The state program is implemented in three stages [3]:
 Stage 1 - from 2013 to 2015, the appropriation amount is 178 547 964.40 thousand rubles,
 Stage 2 from 2016 to 2020, the amount of budget allocations 251 845 185.60 thousand rubles

Stage 3 from 2021 to 2025 the volume of budget allocations 202 710 461.50 thousand rubles.
 In the diagrams, the graph until 2025 is the planned values, the second graph is the calculated actual values.

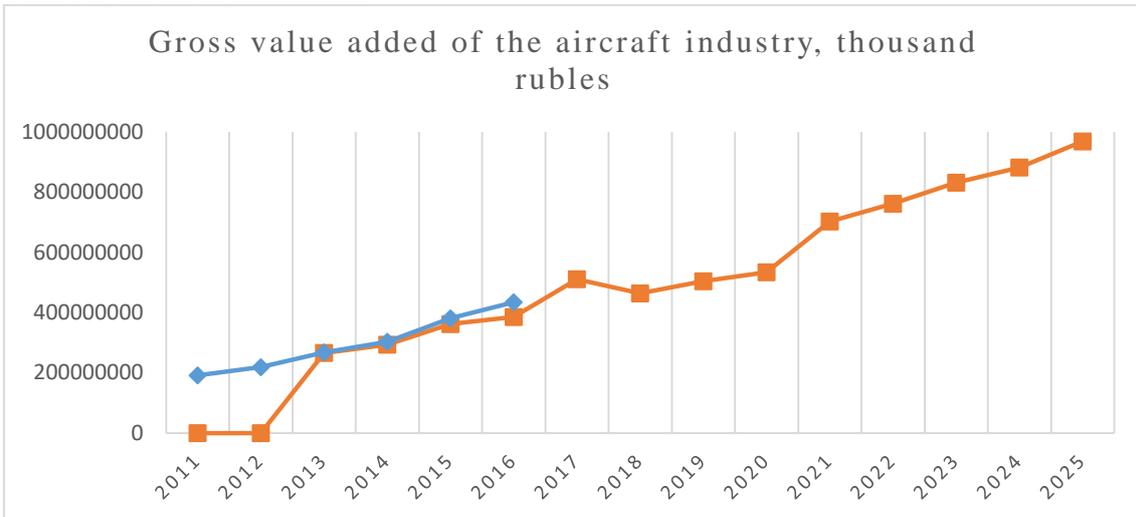


Fig. 4. Gross value added of the aircraft industry, One thousand rubles. [1,7,11]

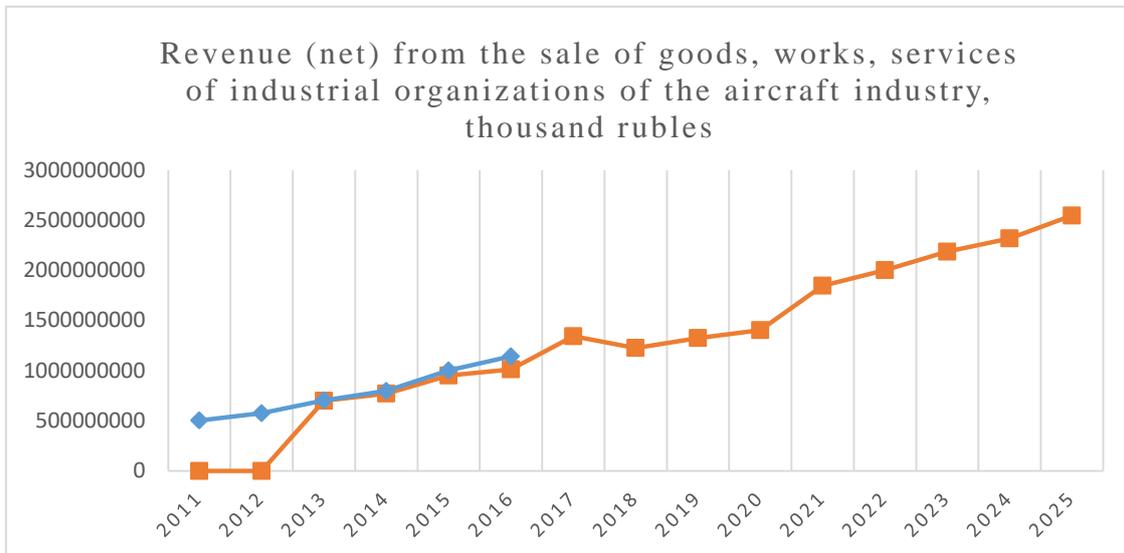


Fig. 5. Revenue (net) from the sale of goods, works, services of industrial organizations of the aircraft industry

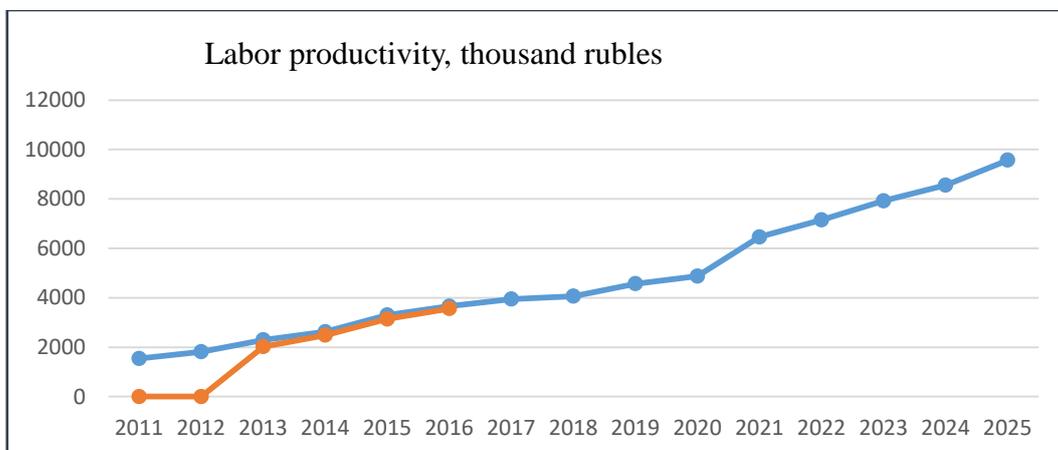


Fig. 6. Labor productivity, thousand rubles

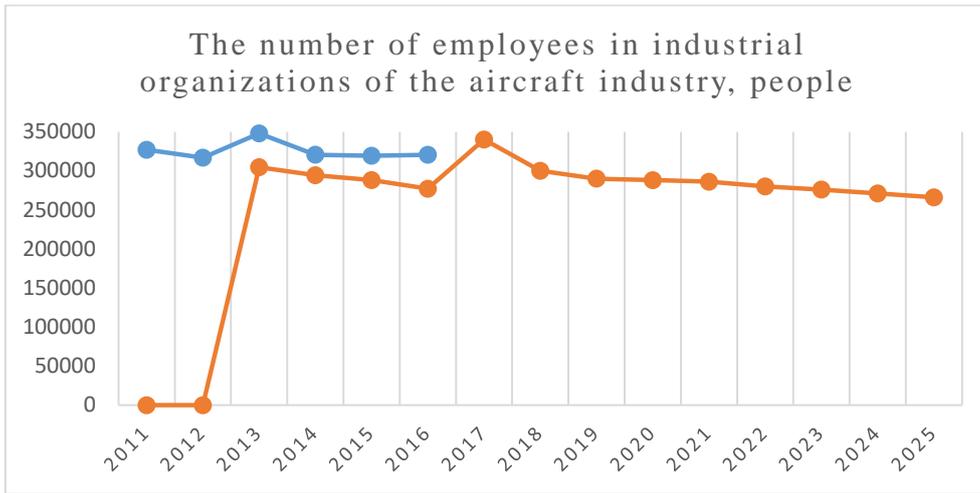


Fig. 7. The number of employees in industrial organizations in the aircraft industry

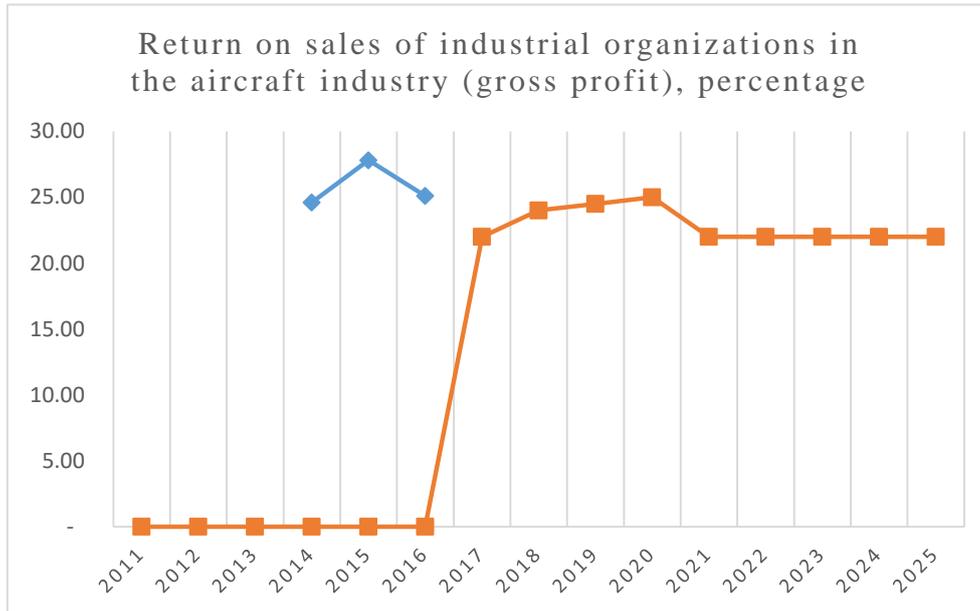


Fig. 8. The profitability of sales of industrial organizations in the aircraft industry (gross profit)

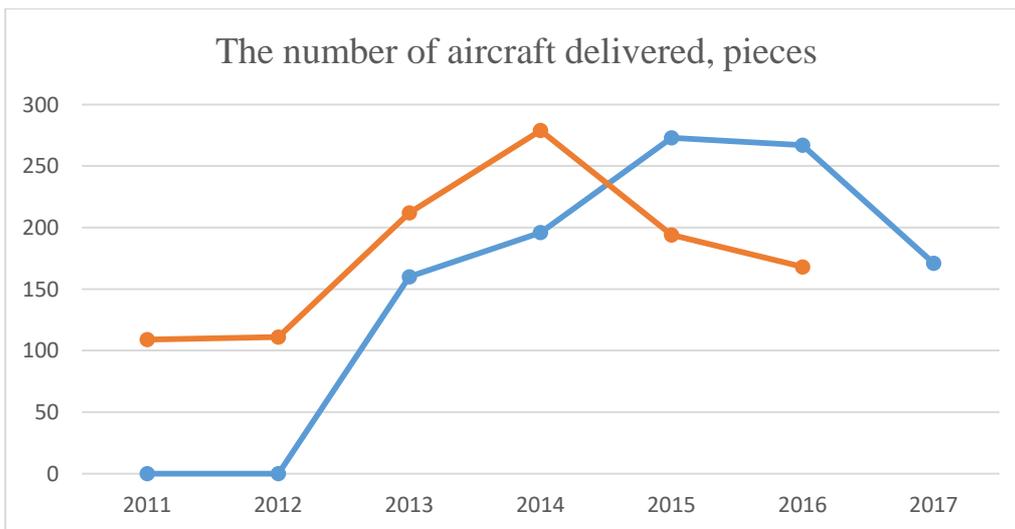


Fig. 9. The number of aircraft delivered.

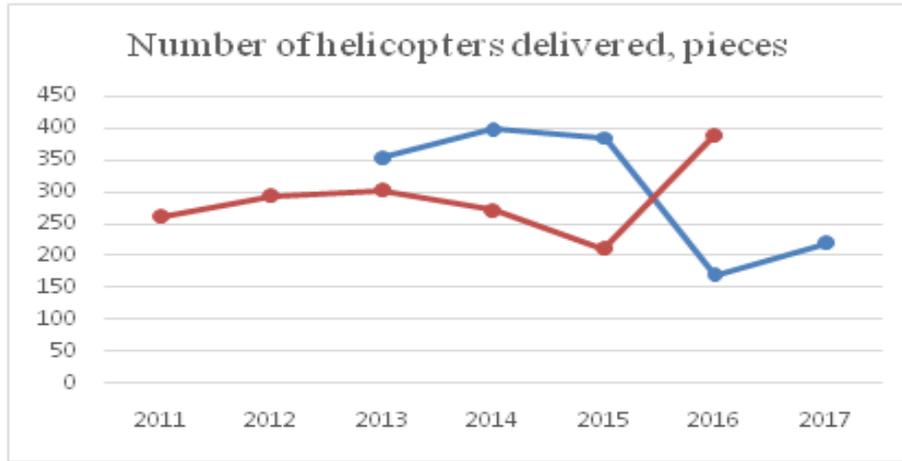


Fig. 10. The number of helicopters delivered. . [1,8,10]

In accordance with the Methodology for assessing the effectiveness of the implementation of state programs of the Russian Federation, a general assessment of the effectiveness of the implementation of the main activities of state programs in the reporting period (OP_{OM}) is calculated by the formula [5,9,10]:

$$OP_{OM} = \frac{k1 \times \sum_{t=1}^Q H_{KC(PP)_t} + k2 \times \sum_{f=1}^F H_K}{k1 \times Q + k2 \times F}$$

$H_{KC(PP)_t}$ - assessment of the occurrence of the t-th control event provided for in the implementation plan;

Q - the number of control events provided for in the implementation plan;

k1 - significance factor of control events provided for in the implementation plan ($k1 = 1,5$);

$H_{K(ПП)_f}$ - assessment of the onset of the f-th control event provided for in the detailed implementation schedule and not included in the implementation plan;

F - the number of control events provided for in the detailed implementation schedule and not included in the implementation plan;

k2 - the coefficient of significance of control events

provided for in the detailed implementation schedule and not included in the implementation plan ($k2 = 1$).

However, this indicator does not give a clear idea of the efficiency of spending budget funds, does not take into account the change in the material, technical, personnel, technological, and innovative development of industry.

The study recommends a comprehensive analysis of the relationship between program indicators and subprograms based on the correlation relationship.

It is necessary to determine the correlation between such indicators as the gross value added by the industry, the return on assets of industrial organizations of the industry, GDP, the size and growth of resource support for the creation and production of aircraft, the number and growth of delivered aircraft according to the

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

Pearson linear correlation coefficient formula (r). [7,8,9]:

III. RESULTS

The study analyzes the planned and actual values of individual indicators of the state program of Table 1 and Table 2, 3 and the correlation results of Table 4 .

Table 1 GDP data and results of the state program.

Год	Gross value added of the aircraft industry, thousand rubles		Return on assets of industrial organizations in the aircraft industry (net profit)		GDP RUB mln	
	План	Факт	План	Факт	План	Факт
2011	0	191 580 195,00	0	5,9	59 431,7	60282,5
2012	0	218 741 641,00	0	5,2	60 235,9	68163,9
2013	266 084 496,00	267 772 973,00	6,7	0,5	62 544,8	73133,9
2014	293 461 504,00	303 242 563,00	6,2	0,2	69 784,6	79199,7

Technology for Determining the Effectiveness of the State Industry Development Program

2015	361 758 621,00	380 854 764,00	6,4	2,1	71 431,1	83387,2
2016	385 248 640,00	434 171 349,00	5,3	2,1	73 719,3	86148,6
2017	510 657 000,00	514 965 748,00	5,5	1,5	78 526,4	92037,2

Tab. 2. Data on resource support for the aircraft industry and the number of aircraft delivered.

Год	Resource support for the creation and production of aircraft		Number of aircraft produced	
	План	Факт	План	Факт
2011	0	0	0	109
2012	0	0	0	111
2013	9092218,4	7246109,2	160	212
2014	8592218,4	8592218,4	196	279
2015	8092218,4	11888702,5	273	194
2016	26251821,5	27455535,9	267	168
2017	32699903	31854773,1	171	150

Tab. 3. Planned and actual increase in resource support for the creation and production of aircraft and the number of aircraft produced.

Growth		2012	2013	2014	2015	2016
Resource support for the creation and production of aircraft	Plan			-5%	-6%	224%
	Fact			19%	38%	131%
Number of aircraft produced	Plan			23%	39%	-2%
	Fact		91%	32%	-30%	-13%

Table 4 Correlation results of planned and actual values of indicators and GDP.

Correlation between characteristics	Plan	Fact
Gross Value Added and Return on Assets of Organizations	0,85	-0,53
GDP and Gross Value Added	0,94	0,97
GDP and Return on Assets	-0,68	-0,68
Gross value added and number of aircraft produced	0,85	0,16
Resource support for the creation and production of aircraft and gross value added	0,86	0,97
Resource support for the creation and production of aircraft and the number of aircraft produced	0,59	-0,80
The increase in resource support for the creation and production of aircraft and the increase in the number of aircraft produced	-0,92	-0,41

The correlation of gross value added and profitability was 0.85 and -0.53, the correlation of GDP and gross value added was 0.94 and 0.96 and the correlation of GDP and return on assets was -0.68 and -0.69, the correlation was gross value added the cost and number of delivered aircraft amounted to 0.85 and 0.16. The correlation of the resource support for the creation and production of aircraft and the gross value added amounted to 0.86 and 0.97, the correlation of the resource support for the creation and production of aircraft and the number of delivered aircraft 0.59 and -0.80, the correlation of the growth of the resource support for the creation and production support aircraft and

the increase in the number of delivered aircraft amounted to -0.92 and -0.41.

However despite the measures taken to achieve the expected result in the formation of competitive and profitable world-class organizations in the main sectors of the aircraft industry, an analysis of asset profitability shows negative dynamics, which indicates a partial absence of the effect of the state program.

An analysis of the correlation of individual indicators shows the lack of interconnection of such indicators as Gross Value Added by the industry and Return on Assets of organizations, resource support for supporting the state program and the number of aircraft delivered. This reflects the need for a systematic approach to assessing the effectiveness of the implementation of the state program and a reasonable integral indicator of the effectiveness of spending budget funds.

Thus, the proposed technology for determining the effectiveness of the state program includes the following steps:

1. Definition of groups of indicators for evaluating the effectiveness of subprograms of the state program for the development of industry.
2. Determination of financial and economic performance indicators (revenues of industry enterprises, profit, return on assets, sales). subprograms - Aircraft, Helicopter, Engine, etc.
3. Definition of indicators of material, technical, technological, personnel development of the aviation industry in the context of subprograms: Aircraft, Helicopter, Engine, etc.;
4. Determination of the correlation relations of program indicators with GDP and other macroeconomic parameters.
5. Definition of complex performance indicators for the implementation of state subprograms in the areas of: Aircraft, Helicopter, Engine, etc., taking into account the correlation.

IV. DISCUSSION

The study analyzes the state program "Development of the aviation industry 2013-2025." A set of program targets is being studied. The technique of evaluating the effectiveness of the implementation of state programs of the Russian Federation is considered. A relevant and significant technology for determining the effectiveness of the state program in the aviation industry has been developed. However, it is necessary to propose a method for determining the structural components of technology for determining the effectiveness of the state program in various areas: Aircraft, Helicopter, Engine, etc. It is advisable to develop a mechanism for assessing the technological, personnel, material and technical development of industry.

V. CONCLUSION

The study analyzes the development of the aviation industry. The problems of assessing the effectiveness of the implementation of the state program are highlighted. Analysis of individual indicators shows a positive trend, which indicates a positive forecast of achievements for the following expected results of the state program. Among which are:

- maintaining the status of the Russian Federation as a world aviation power;
- meeting the needs of the Russian Federation in civil aircraft to a large extent by domestic manufacturers;
- implementation of final integrators, 1st-level integrators, as well as suppliers of 2nd-4th levels in the main segments of the aircraft industry, entering the world market;
- ensuring a significant contribution of the aviation industry to the gross domestic product of the country, guaranteeing a

significant number of highly qualified jobs and ensuring the transition of the Russian economy to innovative digital development.

The analysis of the correlation of individual indicators shows the lack of correlation of such indicators of the development program as the Gross Value Added of the industry and the Return on Assets of organizations, resource support for the state program and the number of aircraft produced. This reflects the need for a systematic approach to assessing the effectiveness of the implementation of the state program and a reasonable integral indicator of the effectiveness of spending budget funds.

The article presents the results of the analysis of the relationship of gross domestic product, target indicators, and performance indicators of the state program "Development of the aviation industry 2013-2025." The technology of determining the effectiveness of the state program is proposed. The results of the analysis can be used in the process of evaluating the effectiveness of implementation and planning of state development programs.

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