

# The Impact of the Development of the Engineering Industry on Economic Security

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## ABSTRACT

The article deals with an actual issues of the influence of the state of industry and mechanical engineering, in particular, on the economic security of the region (as an example, the Republic of Tatarstan) and the economic security of the Russian Federation. In the article, the authors analyzed the dynamics of the indexes of industrial production indices and the employment of the national economy as a whole and by the sector over the period 2014-2019 G., examines indicators of the innovation activity in the sectors of the Russian economy. The article highlights the sector of the Russian economy – mechanical engineering, as one of the areas of ensuring the economic security of the Russian Federation and substantiates the need for the development of industry and mechanical engineering in particular, as important directions of development of the Russian economy.

**Keywords:** *economic security, industry, mechanical engineering, engineering industry*

## 1. INTRODUCTION

The state of economic security of the Russian Federation depends on the state of economic security of Federal districts and subjects, which is affected by the financial and economic state of enterprises in the real sector of this district or subject, and affects the state of economic security as an external factor, which is reflected in the economic security of enterprises. The development and improvement of the country's economy depends on the economic development of enterprises. The slowdown in the global economy, currency volatility, border closures, measures taken by the state in the face of a pandemic, and the difficult political situation also have an impact on the country as a whole, and on the economic situation of enterprises. Processes occurring in the external and internal environment of the enterprise, available tools for assessing economic security, which will allow you to assess the degree of crisis and assess the dynamics of the crisis. We need a tool that allows us to identify and assess the state of «economic danger» and assess the impact of threats.

Mechanical engineering is one of the branches of the national economy that creates new jobs and creates added value not only through margins and resale, but also through the formation of wages in the process of processing raw materials. An important factor in the successful economic development of the country is based on the «non-raw material» economy, but the economy that creates a product, including an innovative one. Machine-building enterprises work in cooperation with energy, metallurgical, petrochemical, and research institutes. Ensuring the stable operation of enterprises in the machine-building industry makes it possible to provide stable working conditions for enterprises that are interconnected with this sector of the economy [1].

Economic security of the region is a set of measures aimed at sustainable, continuous development and improvement of the region's economy, which necessarily implies a mechanism for countering external and internal threats [2]. In the internal structure of the economic security of the region, researchers [3] distinguish the following blocks: economic independence as the ability of the regional authorities to control the regional ones, stability and stability of the regional economy, the ability to self-development and progress.

In this regard, special attention should be paid to monitoring the level of economic security and ensuring the economic security of industries that have a large share in the industry structure of the region, enterprises that are city-forming, budget-generating in the region. For the Republic of Tatarstan, such an industry is mechanical engineering.

## 2. METHODS

As information sources when writing article training and scientific materials on a research subject, periodic literature and data of the rating and analytical agencies acted. Theoretical and methodological bases of studying the theory of public-private partnership in literature are presented by a frame of reference of foreign scientists: P. Bouf, F. Johansson, B. Karlof, J. Keynes, R. Coase, G. Menkyyu, M. Mott, M. Porter, L. Prusak, etc.

The mechanism of implementation of projects of PPP is actively investigated in Russia and in foreign countries. Various aspects of this problem found the reflection in works of such Russian authors as A.A. Alpatov, G.A. Borschevsky, V.G. Varnavsky, A.G. Zeldner, N.A. Ignatyuk, V.N. Ivanov, V.A. Kabashkin, V.Yu. Katasonov, V.V. Maximov, etc. It is necessary to distinguish works E from foreign researchers. Atkinson, J. Delmon, E.R. Yeskomba, V. Kattari, V.V. Knaus, M.K. ewis, F. Marin,

U. Smith, G. Tallok, E. Farkukharson other. The sources of the information when writing the work were educational and scientific materials on the research topic. Research issues of economic security are considered in the economic literature, the study of these issues was carried out by such scientists as: Glazhev S., Senchagov V., Kuklin A., Tatarkin A., Bendikov A., Oleinikov E.A., Morozova A.K., Klimochkina O.V., Aripshv, Gorulev D.A., N.V. Matveev, I.A. Koshkina

### 3. RESULTS AND DISCUSSION

Mechanical engineering is one of the sectors of the national economy that creates new jobs and creates added value not only through markups and resale, but also through the

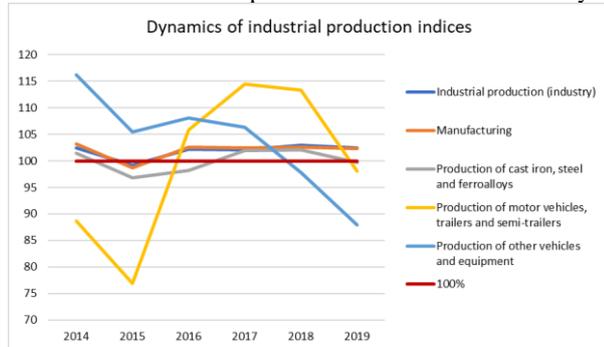
formation of wages in the process of processing raw materials. An important factor in the country's successful economic development is based on the «not raw material» economy, but the economy that creates a product, including an innovative one. Mechanical engineering enterprises work in cooperation with energy, metallurgical enterprises, petrochemical enterprises, research institutes. Ensuring the stable operation of enterprises in the machine-building industry allows us to provide fairly stable operating conditions for enterprises that are interconnected with this industry.

The dynamics of the industrial production index in comparison with the indices by industry is shown in table .1 and in figure 1 [1,4,5].

**Table 1** The dynamics of industrial production indices 2014-2019

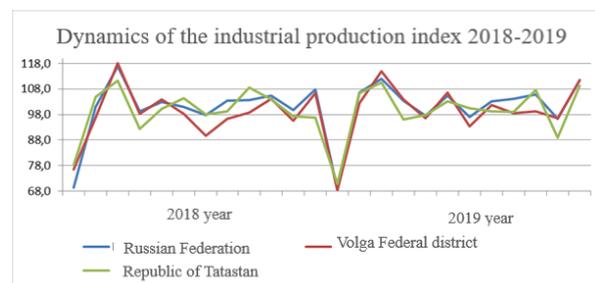
Name of the type of activity	2014	2015	2016	2017	2018	2019
Industrial production (industry)	102,5	99,2	102,2	102,1	102,9	102,4
Manufacturing	103.2	98.7	102.6	102.5	102.6	102.3
Production of cast iron, steel and ferroalloys	101.5	96.8	98.2	101.9	102.1	99.7
Production of motor vehicles, trailers and semi-trailers	88.7	76.9	105.8	114.5	113.3	98.1
Production of other vehicles and equipment	116.2	105.4	108.1	106.3	97.8	87.9

It should be noted that the industrial production index in the mechanical engineering has decreased, which may negatively affect the formation and maintenance of the country's economic security. The figure 1 illustrates the situation of the changes in the industrial production index. The decline was caused by a decline in the economic activity, an increase in the financial crisis phenomena and increased the sanctions pressure on the Russian economy.



**Figure 1** Dynamics of industrial production indices

Figure 2 shows the dynamics of the industrial production index in comparison with the Russian Federation, the Volga Federal district, and the Republic of Tatarstan. [1,5].

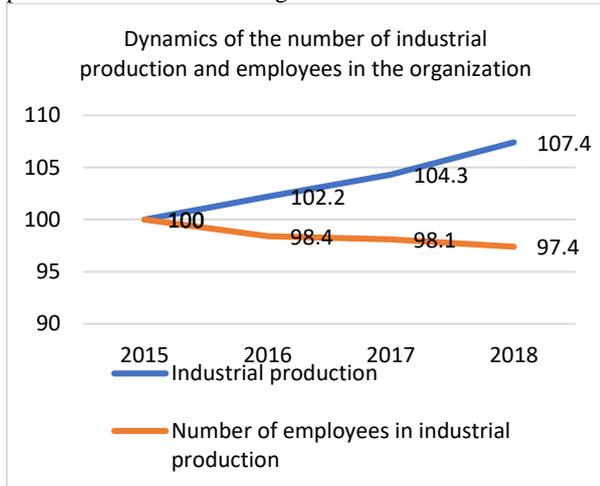


**Figure 2** Dynamics of the industrial production index 2018-2019

In the diagram, we can see that the dynamics of the industrial production index in Tatarstan is similar to the dynamics of the indices in the Volga Federal district and the Russian Federation. This is confirmed by the interdependence of regional and state economic processes. Trends in the development of economic processes in the Republic of Tatarstan correspond to the ongoing changes in the economy of the Russian Federation. The volatility of the index of industrial production indicates problems in the development of industry, moreover, the index of industrial production in a number of periods are below the values of 100%. It should also be noted that in the period of 2019, this indicator has worsened compared to the same periods of 2018. The negative dynamics of the industrial production index indicates a deterioration in the economic security of not only the Russian Federation, but also the Republic of Tatarstan.

Mechanical engineering, as noted above, is an industry that generates jobs and increases added due to this factor. The

dynamics of the number of employees in industrial production and the dynamics of the index in industrial production are shown in figure 3.

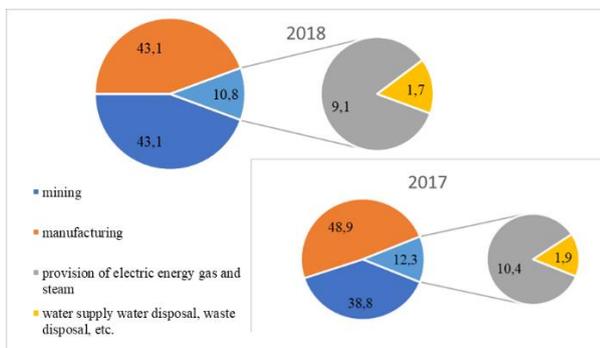


**Figure 3** Dynamics of the number of industrial production and employees in the organization

There is a tendency towards a decrease in the number in the industrial production, due to the modernization of the production and automation of production (which leads to a decrease in the labor intensity of operations and, accordingly, a decrease in the number of jobs in organizations). Nevertheless, manufacturing (including mechanical engineering) creates the largest increase in gross value added in the structure of the economy of the Russian Federation. The Table 2 and the Figure 4 [5] shows the structure of the gross value added of the Russian Federation in 2017 and 2018.

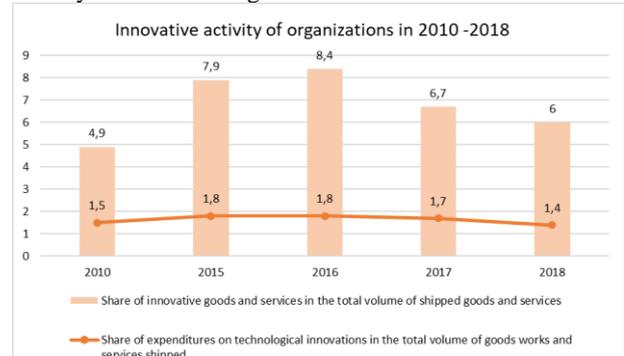
**Table 2** Structure of gross value added by type of economic activity

Activities	2017	2018
Total	100	100
Including:		
mining	38.8	43.1
manufacturing	48.9	43.1
provision of electric energy gas and steam	10.4	9.1
water supply water disposal, waste disposal, etc.	1.9	1.7



**Figure 4** Gross value added by economic activity (2017-2018)

Analyzing the graph, we can conclude that, all other things being equal, if economic trends remained unchanged, the Russian economy was projected to grow industrial production in 2019 and in 2020. These models do not take into account possible risks and external influences. It should be noted that there is a negative trend of decreasing innovation activity in the economy. Indicators of innovation activity are shown in figure 5 and table 3.



**Figure 5** Innovative activity of organizations in 2010 - 2018

**Table 3** Innovative activity of organizations by type of activity

№	Type of activity	2017	2018
1.	Mining	3,9	3,6
2.	Manufacturing	8,6	7,7
3.	food production	7,6	6,6
4.	beverage production	3,4	2,1
5.	tobacco production	2,0	1,8
6.	ptextile production	4,3	3,3
7.	Manufacture of wearing apparel	1,7	0,5
8.	Production of leather and leather products	0,6	0,3
9.	Wood processing and production of wood products	2,1	3,2
10.	Production of paper and paper products	6,4	4,5
11.	Production of electrical equipment	8,1	7,8
12.	Production of machinery and equipment not included in other groupings	7,9	11,5
13.	Production of motor vehicles, trailers and semi-trailers	20	21,1
14.	Production of other vehicles and equipment	25,8	16,5

The Table 3 illustrates that there is a tendency to reduce the innovation activity in all sub-sectors of the manufacturing, except for the mechanical engineering, which can positively affect the development potential of the mechanical engineering organizations and strengthen the position of the enterprises in the market. An innovation activity is one of the factors that affect the economic security and the development potential of the organization in the future. In the economic security strategy [6,7], a challenges and a threats to economic security are identified as: a weak

innovation activity, a lagging behind in the development and implementation of new and a promising technologies (including a digital economy technologies), an insufficient qualifications and a key competencies of the domestic specialists, limited scale of Russian non-resource exports due to its low competitiveness, an insufficiently developed market infrastructure, and a weak involvement in global value chains. Therefore, as the tasks that form the sustainable economic growth of the country, such as support for high-tech small and medium-sized businesses, increasing labor productivity, resource and energy efficiency of a production processes, expanding the use of a production, technological and innovative potential of the organizations are highlighted. The solution of these tasks, of course, will make it possible to implement the main goals and directions of the Federal Law «On Security» dated 28.12.2010 N 390-FZ (as amended on 05.10.2015) and the Decree «On the Strategy of Economic Security of the Russian Federation for the Period until 2030» [ 6,7]. Improvement of the results of the machine-building production [8] directly affects the reduction of industrial and economic risks [9]. This, in turn, as noted by V.K. Senchagov. [10] will have a positive effect on ensuring the economic security of the region and the country.

## ACKNOWLEDGMENT

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## 4. CONCLUSION

Mechanical engineering is one of the leading sectors of the economy (in terms of employment in the economy and the level of gross output). The level of the engineering affects a consumption of materials, the energy intensity of gross domestic product, the labour productivity, an industrial safety and defence of the state, the technical level of industries, the economies, the development of mechanical engineering is essential to the development of the economy and the national economy of the Russian Federation, and hence economic security, of the Republic of Tatarstan and municipalities. The processes taking place in mechanical engineering indicate an increase in negative trends in the economy in the period 2018-2019, the situation of the pandemic in 2020 has strengthened them. These trends have a negative impact on the state of Tatarstan's economic security, since efficient industrial production is the basis of the region's social stability and the budget is a formative factor. In this regard, it should be noted that the enforcement of the main objectives of the security Strategy of the Russian Federation for the ensuring sustainable economic growth of the industrial enterprises, is the basis of the formation of economic security of the regions and countries.

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