

# ANALYSIS OF OPPORTUNITIES FOR DEVELOPMENT OF BULGARIAN INDUSTRIAL MANUFACTURING

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**Abstract:** This publication analyses opportunities for development of Bulgarian industrial manufacturing in conditions of dynamic self-changing competitive environment during the period 2015 – 2018. A comparative analysis is done for different industrial sectors with purpose to determine the trends in their development and to identify the opportunities for improvement of their production activity. Actual statistical data are used and different methods for the existing information analysis. The specific of development in the leading sectors in Bulgarian economy are identified. In addition, a comparative analysis is implemented as well as a classification of different industrial sectors on the base of Index of industrial production is created. The results show that the realized production of Bulgarian industrial enterprises during the considered period increase. This is a reason to search favourable opportunities for their further sustainable development and competitive location on the internal and external markets. Some fundamental problems and barriers in the industrial enterprises are considered, that obstruct the fast temps of their developments and are presented some appropriate decisions. The current publication put the beginning of a more depth investigation of the effectiveness of the industrial enterprises, their capacity utilization, as well as the development and introduction of different types of innovation decisions that will be implemented during the next two years in the range of a doctoral thesis in the field of the same problematics and researching analogical problems in the more comprehensive aspect..

**Keywords:** INDUSTRIAL MANUFACTURING, INDEX OF INDUSTRIAL PRODUCTION, FAVORABLE OPPORTUNITIES, SUSTAINABLE DEVELOPMENT

## 1. Introduction

This analysis provides information on the status and opportunities for development and improvement of Bulgarian industrial production by industry. The aim is to identify the leading industries in recent years and to analyze the opportunities for their sustainable development and improvement. The main sectors with potential for development are constantly being researched, but in general the research on this problem is not done in depth, which is the reason for this research. The analysis is made in three parts.

The first part looks at the impact of the changing economic environment on individual sectors based on industrial production index. The trends in development of the industrial sectors during the period 2015÷2018 are presented, and a comparative analysis is made.

The second part deals with the main key points regarding the investment activity of industrial enterprises, namely the realized investments in industry and their future investment plans.

The third part looks at the main trends in the economic conjuncture of industry among the main industrial sectors. Major barriers have been identified and the most influential barriers to business development have been classified.

## 2. Trends in the development of the industrial sectors in Bulgaria

Bulgarian industry consists mainly of: mining, processing, production and distribution of electricity and heat and gas. There are some key economic indicators measuring, analyzing and representing the development and trends of the industry in Bulgaria. The first part analyzes several major sectors of the manufacturing industry. The subject of analysis are the sectors classified according to the Classification of Economic Activities (NACE.BG-2008):

- Manufacture of computer and communication equipment, electronic and optical products;
- Manufacture of general and special purpose machinery and equipment;
- Manufacture of cars, trailers and semi-trailers;

The main indicators by which the above industries are compared are:

- Value added;
- Industrial production index;

- Domestic and foreign trade;
- Employees;

### Manufacture of computer and communication equipment, electronic and optical products

In 2016 the manufacture of computer, electronic and optical equipment contributes 3% to the value added created by the manufacturing industry, reducing its share by 0.3% compared to 2015.

Manufacture of computers, electronic and optical products "consists of the production of: electronic components and printed circuits, computer equipment, radio, television and telecommunications equipment, consumer electronics, measuring instruments, clocks, electromedical apparatus, optical instruments and photographic equipment, magnetic and optical media, etc. Made by 437 companies.[4]

In 2017 the production of computers, electronic and optical products increased by 21% compared to the previous year. In 2018. The largest increase since 2005 was reported. with nearly 44%. Since 2004. there is an upward trend in production. Since 2008. exports of computers, electronic and optical products are on a steady upward trend. The highest export growth was recorded in 2011. and 2015 or 16% y / y. The overall increase in exports of computers, electronic and optical products in the period 2008-2017. is 113%, and in 2017 C26 exports account for 3.7% of the country's total exports. The number of employees since 2015 increased by about 15% for the period 2015÷2018. or nearly 1.5 thousand more were hired, compared to 2015 (8.4 thousand). [3]

### Manufacture of general-purpose machinery and equipment

In 2016 manufacturing of general and special purpose machinery and equipment contributes 6.4% to the value added created by the manufacturing industry. The production consists of the production of turbines and engines, hydraulic pumps, compressors, fittings, bearings, gears, furnaces and burners, lifting machinery, office equipment, tools, refrigeration and ventilation equipment, agricultural machinery, metalworking machinery, metallurgy equipment. and foundry and other industrial machinery. There are 1,026 companies. In 2016 the production of general and special purpose machinery and equipment increased by 2.2%, and in the next 2017. 14.8% increase in production was reported. In 2018. the index reached a value of 119 points, which is a 19% increase for the period 2015÷2018. [4]

Exports of general and special purpose machinery and equipment have been on an upward trend since 2012, with the highest growth being in 2011, or 52%. The total export growth in the period 2015÷2018, is 19%. In 2017 exports of articles of other non-metallic minerals accounted for 6.9% of the country's total exports. The sector's employees have been slowly increasing since 2015. Since 2015÷2017, the average annual decrease is 0.3%. The total number of employees increased by almost 1.9 thousand people during the whole period. [3]

#### Manufacture of cars, trailers and semi-trailers

In 2016 the manufacture of cars, trailers and semi-trailers accounted for 3.4% of the value added created by the manufacturing industry, reducing its share by 0.2 percentage points compared to 2015. [4]

Automobile production is one of the priority high-tech sectors for attracting foreign investments in Bulgaria, with great potential for development of exports, employment and regional economic activity. The industry is strategic for the economy of the country with a long-term perspective, but at the same time, for its successful development requires a number of factors - infrastructure, specialists and prerequisites for development.

Automobile production in the country has established traditions and experience, a suitable basic infrastructure for the needs of the manufacturing industry has been developed. In recent years, the automotive sector in Bulgaria has seen a significant upswing and has been the subject of increased interest from potential new investors and suppliers of car components.

The average change in the industrial production index in 2016 and 2017, is 10.4% and 7.6% respectively. As for the period 2015-2018, the motor vehicle manufacturing index increased by almost 37 percentage points. Exports of cars, trailers and semi-trailers are also increasing, with a record growth of 60.5% reported in 2010. In 2014 and 2015 industry exports increased by 18% and 28% respectively. In the following years, a drastic decrease in the export from the branch is observed compared to the total export of the country. [4]

There are one car assembly plant in the country, and 126 companies manufacturing automotive components as subcontractors to leading automotive companies. Employees in the industry have seen an increase since 2015 since 2015÷2018, the average annual increase is 12.4%. For the whole period the total increase in the number of employees is close to 3.5 thousand people.

Based on information on changes in industrial production indices in 2015-2018. The author analyzed and systematized the dynamic changes in the industrial production index of the aforementioned industries. Each of the branches is compared to the others, according to the author's average index of industrial production, the following classification is made (Table 1) [4]

**Table 1:** Classification of industrial sectors by average value of industrial production index (2015-2018).

№	Industries	Average value of the Industrial Production Index (2015÷2018)
1	Manufacture of computer and communication equipment, electronic and optical products	114.9
2	Manufacture of cars, trailers and semi-trailers	110.3
3	Manufacture of general-purpose machinery and equipment	107

### 3. Investment activity in industry - key features

This part of the analysis uses data from the NSI Investment Business Surveys, and the monitoring collects information on the investments made and the investment plans of the enterprises. Managers are interviewed twice a year - in March and October, with questionnaires having different content.

About 3,800 enterprises in the industrial sector are interviewed. The results of the survey conducted by industrial enterprises for the period 2015÷2018. The following conclusions about the development and investment activity in the industry in Bulgaria can be analyzed, deduced and marked: [4]

The largest relative share in the expected investments is concentrated in the increase of the production capacity, formed overall for the country. Data show that in 2015, The value of investments for increasing production capacity is the lowest - 29.1%, as in 2016. It increased by 6.1% and reached its highest value - 35.2%. Over the next two years, investments fall to 33.3% of the total investment in industry.

Second is investment in replacement of worn-out equipment. There is a trend of increasing investments for replacement of worn out equipment - in 2015, the investment in the represented production group is about 29.3%, and at the end of 2018, increased to 31.3%.

The downward trend in investment is also observed in the next production group - mechanization and automation of the existing production process and introduction of new production technologies - from 24.2% in 2015 to 20.5% at the end of 2018. Investments related to environmental protection, security measures and others also tend to decline. From 17.4% in 2015 to 14.9 at the end of 2018. Investments in the production of non-durable consumer goods decreased (from 20.4% in 2015 to 18.7% at the end of 2018), while investments in the production of intermediate goods increased by 11% in the period 2015-2018 and reach 42.9%. [3]

One of the factors influencing the decisions for investments in the Bulgarian industrial production in the next year, namely the demand for production has the lowest value in 2015, - 47.2% and the highest value was reported at the end of 2017 (50.4%). In 2018, a decrease of about 3.2% was registered.

In the distribution of expected investments by major production groups for the period 2015-2018, there is a decrease in the expected investments in the energy and water-related industries - for 2015, they are about 33.7%, and at the end of 2018, they reach 21.7%. The growth of expected investments marks the production of intermediate goods - by 31.9% (in 2015) increased by 11% and recorded a value of 42.9% (in 2018).

The distribution of planned investments by major production groups for the period 2016 - 2019 outlines a trend to reduce planned investments in energy and water-related industries - from 39.4% of planned investments for 2016 to 29.3% in 2019. The production of intermediate goods marks the highest growth of planned investments for 2017 (40.85), with the lowest value in 2016. (32.4%). An increase in the value of planned investments is expected in the production of non-durable consumer goods as well as in the production of investment goods.

In terms of R&D expenditure by funding source and sector, the following classification can be made:

For the period 2015÷2018, there is a lasting trend of increasing R&D investment by enterprises. The same conclusion can be made regarding the investment of R&D by the public sector and non-profit organizations developing in the industrial industry. On the other hand, the tendency to reduce the participation of foreign investments in improving R&D can be highlighted.

According to the NSI, industrial enterprises are classified into several groups based on employees. (Table 2)

Table 2: Classification of industrial enterprises by number of employees according to NSI

№	Classification of enterprises by number of employees
1	1 to 9 employees
2	10 to 49 employees
3	50 to 249 employees
4	250 to 499 employees
5	500 or more employees

The trend observed can be outlined as follows:

R&D expenditure in industry by size of enterprise for the period 2015÷2018 has been steadily reduced. Only companies with between 10 and 49 employees increase their costs related to improving and improving their R&D activities. All other aforementioned companies concentrate their strategies and policies on almost double the cost reduction. [4]

#### 4. Business trends in industrial production. Analysis and classification of major barriers to industry development.

This part of the analysis presents and analyzes the business trends or so-called Business Surveys (NSI) surveys. Unlike traditional statistical surveys, business trends present information of a largely non-quantitative, verbal nature. They seek input from economic agents (business managers and consumers) about current or expected changes in a particular set of economic variables or

estimates of the current level of these variables. In short, business surveys provide important and different information than traditional statistics, namely information about the prevailing, most widespread opinion about the present or future behavior of an economic phenomenon. Future information is an extremely important feature of business trends, which in turn makes them an extremely good source for early warning systems for changes in the economy. [4]

Although business surveys do not collect numbers but views, it is logical to think that opinions about increased production, exports, etc. for example, it weighs more on a large enterprise than the same opinion on a small industrial enterprise. This is due to the generally accepted fact, namely that the contribution to the economic activity of different organizations (enterprises, companies) is different and directly related to their size (scale or market share). From an industry perspective, each industry's contribution to economic activity is proportional to the added value it brings to the economy.[1]

In order to use and analyze business survey data (through a survey) as short-term economic indicators, it is important to translate non-quantitative responses into quantitative indicators. The balance of views is most appropriate.

In Fig. 1 presents the change of the present business situation of the industry for the period from 2015 to 2018. The balance of opinions indicator reached the lowest value of 21.6% (in April 2016) and the highest - 41.8% (in July 2018). The trend towards the present business situation in the industry is characterized by gradual development. [4]

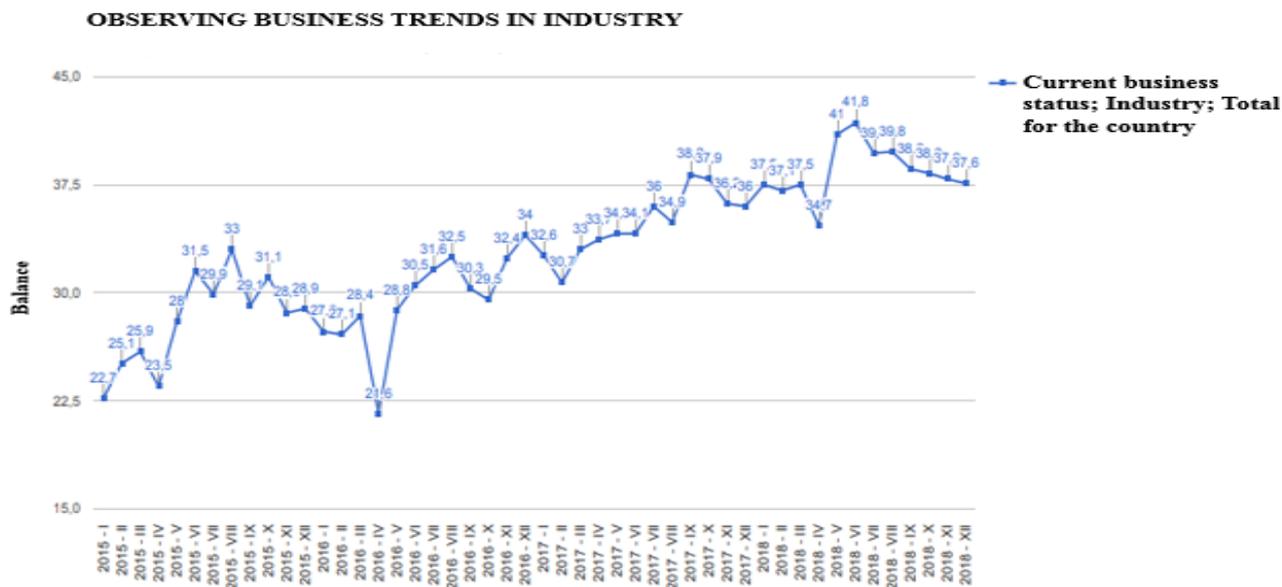


Fig. 1. Changes in the business situation of the industry for the period from 2015 to 2018.

The following factors are an integral part in forming the so-called business climate in industry: [4]

- Uncertain economic environment;
- Insufficient demand from the country;

- Weaknesses in economic legislation;
- Insufficient demand from abroad;
- Shortage of materials and / or equipment;
- Financial problems;

- Labor shortages, including skilled labor;
- Competitive imports;
- Energy shortage;

Among the factors influencing the economic situation of the industry are the current production activity, the level of orders and the level of finished goods stocks.

In this part of the analysis, an attempt was made to classify the "Most serious obstacles to the development of industrial production".

According to the analysis of data from the NSI Business Information Surveys for 2015 In the first three places, the following factors are the most serious obstacles to the development of business (industry): uncertain economic environment, insufficient demand from the country and weaknesses in economic legislation. With less influence are indicated - shortage of materials and / or equipment, shortage of labor, including qualifying. With little influence on the business situation of the industry, the factors are competitive imports and energy shortages.

The trend for the most influential factors continues in 2016. In the first place are the uncertain economic environment and the insufficient demand from the country. Factors such as labor shortages, including skilled labor and competitive imports, all increase their negative impact on industrial production. With a less significant impact are again a shortage of materials and / or equipment and a shortage of energy.

In 2017 the so-called 'most serious impediments to the development of industry' classification occupy the forefront - an uncertain economic environment and labor shortages, including skilled labor. The factors affecting the insufficient demand from the country and abroad, the weaknesses in the economic legislation, the competitive import, the financial problems of the industrial enterprises are characterized by the weak influence and lastly the shortages of materials and / or equipment and the energy shortage are again mentioned. .

The level of finished goods stocks also provides information on the development of the economic situation of the industry. At the beginning of 2015. at the level of stocks of finished industrial production is positive - there is a surplus. Over time, there is a trend of shortage of stocks of finished industrial production by May 2018, when a positive value of this indicator is taken into account. The surplus of finished products is observed by the end of 2018.

## 5. Conclusion

The stability, development and refinement of each industrial sector plays a particularly important key role in enhancing economic growth, job creation, promoting the expansion of production capacity of Bulgarian industrial enterprises, with both export and import projections.[2]

In this publication, a small fraction of the sectors that build and describe such a complex and dynamically developing Bulgarian industrial industry are presented and analyzed. The focus of the analysis is on selected industries. As a result of this study, some scientifically sound guidelines for their future development are offered:

1. Optimization of the organizational structure of industrial enterprises;
2. Creating new jobs and investing in staff training ;.
3. Technological modernization and creation of high value added products.

4. Modernization of outdated infrastructure and expansion of the transport network in the country.

5. Introducing a vision for the development and functioning of the industrial sectors.

6. Increasing the cost of R&D, as it is a factor that has a positive impact on the economic growth and competitiveness of enterprises.

7. Attracting more foreign direct investment as a major source of economic growth and a factor in achieving and improving the competitiveness of industrial enterprises.

8. Increasing the competitiveness of industrial production by increasing the degree of resource efficiency.

9. Stimulating technological innovation.

10. Stimulate the creation of new innovative products.

11. Strengthening the Business - Academic - Country.

The prosperity of the Bulgarian industrial production goes hand in hand with the macroeconomic situation and the business climate in the country, with the introduction of incentives for attracting foreign investors, improving the conditions for investment realization, expansion and modernization of infrastructure, more targeted and specific policy, aimed at improving the quality of education in the country and the availability of well-prepared and skilled workforce. A broader analysis of these factors affecting the industry is the subject of a follow-up study.

## 6. References

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