Possibilities for the structural transformation of the timber industry of Rostov Region

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Abstract. The current task for the regions is to diversify the sectoral structure, which ensures the overall stability of the economy. For industrial regions, such as the Rostov region, the priority of structural transformation is the formation of technological and non-resource industries, such as the timber industry. In this regard, the purpose of the study is to assess the potential for structural transformation of the emerging timber industry in the Rostov region and identify mechanisms to enhance its growth. The provisions of the concept of regional competitiveness, the model of technologization at the institutional level, as well as problem-oriented and predictive approaches are the methodological basis of the research. The methods of the study are statistical and grapho-analytical. As a result of the analysis, the transformations that have taken place in the industry of the Don region over the past 10 years are identified, and the main results of this transformation in the timber industry are described (in terms of employment, wages, profitability and capital-labor ratio). Modern trends and external challenges for the timber industry in the region are also identified, on the basis of which new opportunities for its development through cooperation and clustering are justified.

1. Introduction

To model economic profile changes, to foresee the specialized industries development trends, to stimulate the development of the high productive and technological industries, providing them with the properties of a locomotive pulling a whole regional socio-economic system to a new level of development, are the main tasks of modern regional economic policy. Industry is traditionally one of main industries in national or regional economy. It is customary to make judgment about the general economic potential of the territory according to its development, manufacturability, industry innovation as well as the degree of its diversification. At present, the modern world is experiencing the post-industrial stage of its development, and modern society in terms of distribution of the leading role among the production factors is informational. However, the role of the industrial sector is still remaining significant. Modern industry, integrating the achievements of the latest scientific and technological revolution, remains the basic industry of material production and reflects the level of the
productive labor force development. Due to this fact there is a process, reformatting the internal structure of economies, including the strengthening of the manufacturing industry positions and high-tech industries in gross product structure [1].

Taking into account that it is topical to ensure the managed technologization of regional development, the task of this research is to search the mechanisms to implement the region’s industrial potential, in particular, timber industry. The regional competitiveness management concept, containing a number of tools and methods allowing solving this problem may be considered to be sufficiently tested and successful.

Significant results in the context of improving competitiveness at all levels are contained in the study of competitiveness by K Momaya [2], which systematizes the main approaches to determining competitiveness in the country, institutional and historical context. One of the interesting conclusions of this study is the revealed regularity that at the macro level there are no inevitable trade-offs between business growth, social and environmental factors. It follows that it is possible to implement a holistic approach to competitiveness at the regional level.

In the study of J de la Vega, J Azorín, A Segura, M Yago [3], regional competitiveness is widely interpreted, which includes an effective symbiosis of such resources as the production base, labor resources, institutional conditions, infrastructure and knowledge. The authors also believe that the key goal of regional competitiveness growth is to improve the quality of life of the population.

We share the approach proposed in the study by K Aiginger and M Firgo [4] to determine regional competitiveness as the ability of a region to deliver beyond gross domestic product goals. For regions in industrialized countries, this ability depends on innovation, education, institutions, social cohesion and ecological ambition.

The regional competitiveness growth based on the region’s competitive advantages implementation is connected with several specific aspects. These aspects include the production basis growth, population’s rising living standards as well as an infrastructural and institutional development. That is why competitiveness is an integral, systemically important criterion of the effective social and economic development of the region in general [5].

Another well-known scientist L Badd [6] explores competitiveness from the angle of the so-called localized economy, i.e. among certain activities or territorial markets and they compete in terms of how well infrastructural and institutional conditions are developed and other macroeconomic factors.

Forecasting and prediction of the external environment trends are very important to assess and boost competitiveness. The works of modern futurologists S Sarasvarthy [7], N Taleb [8] are devoted to a high role of changes prediction, and whose ideas were used in this research to identify the most important modern trends able to influence on the economy sectoral structure.

2. Methods and materials
The research methodology is based on the points of the regional competitiveness concept on the need to ensure sustainable growth rates. The study methods were statistical and grapho-analytical. The study reveals trends in the industrial profile of the Rostov region through structural and dynamic analysis, identifies positive effects of diversification through comparative analysis, and identifies new opportunities for the development of the timber industry through problem-oriented and predictive analysis.

Rostov Region is a developed industrial region (one of the top 15 regions of the Russian Federation for the shipment of goods of manufacturing industries), where industry plays a significant role and takes an important place in the regional economy. Thus, by the end of 2017, industry accounted for 27.1% in the structure of gross value added of the Rostov region. Traditionally the manufacturing industries are the most important among aggregated industries in industry. This kind of economic activity took 20.6% in the structure of the gross value added of the region.

Moreover, in recent years the industry share in gross value added of the region is increasing that is mostly connected with the import substitution policy implementation and an increase in deliveries within the framework of the state defense order (figure 1). Thus, if in the period of 2012-2014 there
was some decrease of the industry share in gross value added in comparison with the basic period of 2010, then in 2015-2017 there was sustainable growth with the largest value for the entire analyzed period in 2017.

Figure 1. Dynamics of the industry share in the structure of the gross value added of the Rostov region in 2010-2017.

At the same time, the share of high-tech products and high-tech mid-level products in the shipment structure by type of activity ‘Manufacturing’ is 32.9% in the Rostov Region (it is 27.74 in Russia), it means that the Don region is the most advanced and competitive because these very industries possess the potential for the most dynamic growth due to expanding markets for industries of previous technology patterns.

As for the dynamics of shipped products in industry as a whole (totally for four kinds of economic activity), within the analyzed period 2010-2018 there was a steady growth of the industrial production volume in value terms (figure 2). If in 2010 volume of shipped goods of own production, performed works and services in-house by industry totaled to 432 bln rubles, then in 2018 – 1,054 bln rubles. Industrial production index dynamics during 2010-2018 was also constantly positive.

Figure 2. The shipped goods volume dynamics of our own production, work and services performed on our own in the industry as a whole and the industrial production index of the Rostov region for 2010-2018.
The high level of the Rostov region industry development allowed demonstration steadily positive and faster economic growth rates than in Russia: since 2010 the Rostov region gross regional product growth rate turned out to be twice higher than the Russian Federation gross domestic product growth rate (figure 3).

Moreover such stability of the Rostov region gross regional product growth rate is connected with highly diversified level of economy that allows operate with compensating mechanisms in the periods of economic recession. For example, when the Russian economy was in the 2014-2015 recession the Rostov region economy continued growing due to: 1) the presence of sectors with increased momentum in connection with the actualization of the import substitution policy, which can also include the timber industry; 2) the presence of powerful defense industry enterprises included in the state defense order program; 3) the presence of the export-oriented industries (metallurgy, petrochemicals, engineering, IT sector) which benefited from the devaluation of the ruble; 4) the presence of the developing industries which gained and used new market opportunities while preparation and hosting the 2018 Football Championship.

Within the study on changes in the Rostov region industrial production structure it is possible to distinguish eight large industries within manufacturing industries (table 1). Totally 92.5% of all manufacturing shipments counted to these eight industries. Obvious structural shifts are manifested in strong engineering industry leadership (firstly, it was conditioned by helicopter production volume growth in Rostvertol company due to significant growth of the state order at that period and export contracts) and fast growth of oil refining (bitumen shipping growth by Novoshakhtinsk Oil Product Plant).

The task of forecasting industrial growth, especially for a long-run term, makes it necessary to take into consideration these structural changes in the Rostov region’s specialized industries, because among individual sectors there are significant differences in capital-labor ratio, the composition and quality of the used labor resources, level of investment and innovative activity and other parameters of the production activity.
Table 1. The positions of the enlarged industries in the frames of the manufacturing industries in terms of ‘volume of the shipped goods of own production, performed works and services on their own’ in Rostov region in 2010, 2014, 2018.

| Industry                      | 2010     | 2014     | 2018     |
|------------------------------|----------|----------|----------|
|                              | Cost     | Cost     | Cost     |
|                              | volume,  | volume,  | volume,  |
|                              | billion  | billion  | billion  |
|                              | rubles   | rubles   | rubles   |
|                              | share,   | share,   | share,   |
|                              | %        | %        | %        |
| Engineering                  | 89.6     | 140.9    | 242.5    |
|                              | 26.0     | 27.2     | 27.7     |
| Oil refining                 | 30.3     | 49.9     | 146.2    |
|                              | 8.8      | 9.6      | 16.7     |
| Food and processing industry| 93.2     | 124.4    | 143.8    |
|                              | 27.0     | 24.0     | 16.4     |
| Metallurgy and metal products| 61.8     | 92.3     | 120.4    |
|                              | 17.9     | 17.8     | 13.8     |
| Construction industry        | 18.1     | 28.7     | 69.3     |
|                              | 5.3      | 5.5      | 7.9      |
| Chemical industry            | 23.2     | 33.1     | 58.7     |
|                              | 6.7      | 6.4      | 6.7      |
| Light industry               | 14.8     | 22.2     | 27.7     |
|                              | 4.3      | 4.3      | 3.2      |
| Timber industry              | 22.8     |          |          |
| others                       | 14.0     | 27.4     | 42.9     |
|                              | 4.1      | 5.3      | 5.0      |

The timber industry is one of the emerging industries with high growth prospects. Currently, it is based on small and medium-sized enterprises that are characterized by high dynamism of development. Significant transformations are seen inside the region’s timber industry (table 2).

Table 2. Positions of enlarged industries within the timber industry complex in terms of the ‘volume of shipped goods of own production, works and services performed on our own’ in the Rostov Region in 2010, 2014, 2018.

| Industry                        | 2010       | 2014       | 2018       |
|---------------------------------|------------|------------|------------|
|                                 | Cost       | Cost       | Cost       |
|                                 | volume,    | volume,    | volume,    |
|                                 | billion     | billion     | billion     |
|                                 | rubles      | rubles      | rubles      |
|                                 | share,      | share,      | share,      |
|                                 | %           | %           | %           |
| Timber processing and wood      | 0.07       | 0.4        | 1.3        |
| products production             | 0.8        | 3.7        | 5.6        |
| Paper and paper goods production| 1.4        | 3.7        | 10.5       |
|                                  | 15.5       | 32.7       | 46.3       |
| Printing activities             | 2.5        | 2.6        | 4.5        |
|                                  | 27.5       | 22.8       | 19.8       |
| Furniture production            | 5.1        | 4.7        | 6.4        |
|                                  | 56.1       | 40.8       | 28.3       |
| Timber industry in a whole      | 9.0        | 11.5       | 22.8       |
|                                 | 100        | 100        | 100        |

The production of paper and paper products is the largest value within the industry and it has increased 7.5 times for eight years, having increased its share from 15.5% to 46.3% in total shipment. 50% of all fixed investment and the fixed assets of the timber industry value accounts to it. Furniture production takes the second place, 80% of which is located in the town of Volgodonsk. In general all timber industries see growth trends, which are provided by a decrease in the average number of employees and an increase in the wage fund.
3. Results and discussion

Rostov region has strong positions in terms of industrial base development. The region is among top 15 region of the Russian Federation, the industry share totaled to 27.1% in 2018 in the structure of gross value added of the Rostov region. At the same time, the share of high-tech products and mid high-tech products of the highest level in the shipment structure is high - 32.9% (while in Russia - 27.74%). Broad diversification and high level of industry development allowed the Rostov region to show positive and faster rates of the economic growth then in Russia (129.4% gross regional product growth index in 2018 by 2010 against 115.6% in the Russian Federation).

The timber industry is a new emerging industry for the Rostov region, associated with new prospects, the implementation of which will increase the degree of diversification of the industrial profile of the region. The growth of the timber industry's output volumes in recent years is more than 20% per year. The production of paper and paper products is growing at the most progressive rate. Overall, significant growth prospects remain for all sectors of the timber industry.

To develop the timber industry it is necessary to take into consideration the external trends influence, such as strong competition at the world market in the manufacturing industry, especially from the part of the developing countries (according to the forecast such countries as China, India, Brazil, Indonesia, South Korea, Russia will form more than a half of total contribution to global gross domestic product growth by 2025) [9]); stricter requirements for environmental friendliness of products and production processes, digitalization and automation of production and other trends.

Also, to create new opportunities for the development of the timber industry in the Don region, it is necessary to take into account the global trend of combating CO2 emissions, implemented through the use of low-carbon materials in the construction sector. In this context, wood has significant advantages over conventional building materials such as steel and concrete, which have a much higher associated carbon footprint and environmental impact [10, 11].

Moreover, taking into consideration the increasing role of technological production industrial customization, clustering is a new effective form of development of the region’s timber industry. For example, a furniture cluster was set in Rostov region in the end of 2017 comprising Limited liability company ‘Almaz’, The Volgodonsk plant of wood boards and Limited liability company ‘Dryada’. Association of forestry enterprises will help enter new markets and cut costs through inter cluster cooperation. Volgodonsk furniture cluster employs 3000 people. The cluster enterprises are actively conducting technical re-equipment of production, reconstruct new production capacities and introduce modern hi-tech equipment.

Effective regional competitiveness management policy is an objective demand and at the same time it will help solve a number of sate problems including in the sphere of economic security, since the stability and territorial balance of the levels of socio-economic development of the region is ensured.

4. Conclusion

As a result of the research, it was revealed that the Rostov region has a high industrial potential, expressed in the presence of a developed industrial base, experience and competence in the creation and promotion of new industries. State policy priorities include further diversification of the region's industrial profile. One of the new promising areas of development is the timber industry, which has shown high growth rates in recent years. Regional timber companies are small or medium-sized gazelle companies that need assistance to scale their business.

The main contribution of this research is the proof of the possibility of a particular region to develop more dynamically than at the macroeconomic level of a country as a whole. At the same time, the growth rate and stability of the regional economy to crisis shocks largely depend on the degree of diversification of the sectoral structure of the economy. In this study, we use the concept of regional competitiveness, defined as the ability to ensure sustainable and high growth rates based on the formation of a diversified and technological economy with the ultimate goal of improving the welfare of the population.
It is only possible to increase the industrial sectors competitiveness with technologization, effective system to stimulate the development of modern, formed under external influence trends, hi-tech enterprises, including the provision of the additional state financial, institutional and organizational support of the innovative activity.

The mechanism for the successful development of the timber industry in the region is the process of clustering production, which allows you to significantly increase production and reduce costs due to cooperation, which is proved by the example of traditional branches of the Don economy. Currently, a furniture cluster has already been created in the city of Volgodonsk. It is important to analyze and evaluate the effectiveness of the furniture cluster in future studies in order to replicate the experience gained in other branches of the timber industry of the Rostov region.

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