Implementation of the export potential as a factor in sustainable development of the forest sector: regional aspect

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Abstract. At the present stage of economic development, international trade is becoming an arena for solving geopolitical problems. The implementation of the export potential in the context of the concept of sustainable development is based on a detailed analysis of trends in theexport specialization of national economy priority sectors. The subject of the study is the regional forest sector. The provisions of the theory of comparative advantages served as a methodological basis. The article summarizes approaches to assessing the export potential, analyzes the commodity and geographical diversification of the Russian forest sector. The relevance of improving the analytical tools for assessing the sustainability of sectoral socio-economic systemsis proved. The information basis of the study is official customs statistics. An analysis of the dynamics of exports made it possible to assess the impact of economic instruments, regulatory and managerial influences, and customspolicyon the development of the export potential of the forest sector. The index of Revealed comparative export advantage has a multiplicative character. It made it possible to obtain detailed information for the development and adjustmentof strategies for territorial and sectoral development. The authorsidentified export specializationproducts of the forest sector of the Russian Federal Districts. An insufficient level of use of resource potential and a narrow specialization of most forested regions in products with low added value were stated.

1 Introduction

Sustainable development of socio-economic systems is a modern paradigm for meeting individual and social needs [1].

The close interconnection and interdependence of the development of all socio-economic systems, regardless of their level and subject orientation, is characteristic of globalization processes. Realization of export potential, its identification as a factor of sustainable development do not lose their relevance. The formation and development of the national economic potential is determined by the socio-economicefficiency of its sectoral structures.

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The stability of the industry is ensured by the creation of a high- value-added product that is in demand on the domestic and foreign markets.

The instability of the linear economic development, together with the aggravation of geopolitical disagreements, make the issue posed in the article debatable. The problem of ensuring sustainable development is of an interdisciplinary scientific and applied nature.

The works of a number of modern researchers is devoted to the development of methods for increasing the stability of regional foreign trade models. Coşar and Thomas substantiate optimal trade routes in Southeast Asia. The export chains modeled by them take into account the geopolitical situation in the macro-region, neutralize the threats to economic security [2].

The key criterion in choosing a model for the formation and development of export potential is value added and relative indicators calculated on its basis. Veeramani C and Dhir G map participation strategies in global and domestic value chains. Based on the analysis of statistical data, the authors identify factors for the growth of export volumes and manufacturability [3].

The need to promote the sustainable development of industries is noted by many scientists. The issue is especially relevant for industries and activities, the basic resource of which is a certain natural asset [4]. The forest sector is a classic example and, for the purposes of this study, an object.

Pant M and other prove the dependence of the competitiveness of national economies in the global market on the level of sectoral export potential. An analysis of the comparative advantages of the main industry goods makes it possible to establish trends in the development of economic sectors, for example, the Indian healthcare industry [5], the Russian forest sector [6]. At the present stage of development, the impact of financial integration and export diversification on the achievement of sustainable development goals is becoming more and more obvious. This dependence is especially pronounced in developing economies [7].

The development and adjustment of national and sectoral strategies require taking into account the peculiarities of spatial development. This circumstance increases the relevance of research if the object is territorial-sectoral economic systems.

2 Materials and methods

The purpose of this study is to assess the export potential of the forest sector of the Russian FederalDistricts and to establish the impact of trends in its change on the development sustainability of the country's forest sector.

The purpose of the study is achieved by solving its tasks:

- study and generalize approaches to assessing the export potential of socio-economic systems ofdifferent levels;
- analyze the structure and dynamics of the export specialization of the forest sector of the districtsof the Russian Federation based on the methodology for assessing comparative advantages;
- identify trends in the export specialization of the forest sector and establish their compliancewith the objectives of development.

The assessment of the commodity and geographical diversification of the forest sector of the Russianeconomy was carried out on the basis of the methodology for determining the comparative advantage index proposed by B. Balassa. This indicator was subsequently repeatedly transformed by other researchers [8,9]. In this study, the index of revealed comparative export advantage (RCEA) iscalculated according to the formula: $RCEA_{cp}$

$$\frac{E_{cp}/E_{cn}}{E_{mp}/E_{mn}} \quad (1)$$

$$RCEA_{cp} > 1 \quad (2)$$

$$RCEA_{cp} < 1 \quad (3)$$

The symbol E denotes the volume of exports, indices c and p denote the country (region) and product, respectively, n denotes all commodities, m denotes all countries (1). The value of RCEAcp above one

indicates the demand for the industry product on the world market and, accordingly, the presence of a comparative advantage over other countries (regions).

The index was calculated both for the total industry product of the forest sector of the Federal Districts and Russia as a whole, and for its disaggregated components.

The branch product of the forest sector for the purposes of this study is the product groups 44-48 of the Commodity Nomenclature of Foreign Economic Activity, corresponding to codes 16-17 of the All- Russian Classifier of Products by Type of Economic Activity. The commodity nomenclature of foreign economic activity was developed on the basis of the Harmonized Commodity Description and Coding System (HS), used to systematize the data of the customs departments of the Federal Districts, which reduces the likelihood of inconsistencies when comparing the volumes of world and regional exports.

E.L. Andreeva, E.V. Malysheva consider the export potential as an indicator of the competitiveness of the territorial socio-economic system in global markets. The authors combine resource and process approaches and correlate the competitive advantages of the product with the satisfaction of the needs of the external market to identify the essence of the category "export potential" at the level of the national economy [11]. In collaboration with other authors E.L. Andreeva explores the impact of innovative and financial factors on the development of Russian regions technological exports and identifies the priority importance of business digitalization. Researchers understand the export of goods and services of high technology industries as technological exports [12]. It is a value-added product produced with development content in mind.

I.L. Lyubimov, D.G. Mirakyan evaluates the sectoral structural transformation and geographic diversification of the Belarus economy, modifying R. Hausmann's theory of economic complexity. They note stagnation processes and extremely moderate rates of economic complication of the Republic's exports. The authors come to the conclusion that it is necessary to increase the mass production of goods of high quality and wide functionality. The key problems, in their opinion, lie in the lack of implementation of information and communication technologies and low volumes of foreign direct investment in traditional industries. The influence of these factors exacerbates the limited potential of traditional markets for Belarusian exports, in particular, Russian [9].

A.K. Moiseev, P.A. Bondarenko emphasize the value of aggregated indicators for building and describing macroeconomic models. The Economic Complexity Index (ECI) reflects the degree of diversification of national economies and the demand for their goods on the world market. The authors analyze the data of customs statistics and confirm the argument that the level of income of the population depends on the complexity of the production structure of the national economy [10].

Industry financial and economic models are traditionally based on trade balance formulas, input- output models and their modifications. R.V. Gordeev measures the level of competitiveness of the forest sector in different countries and regions of Russia using a methodology for assessing the comparative advantages of industry products. This methodology is based on a combination of the balance of trade formula and the binary

indicator of competitive advantage in world trade. The author grouped Russian regions according to the level of competitiveness of a disaggregated industry product [6].

T.E. McConnell et al analyzed the forest sector import-export chain (FSIEC) of the United States of America and found that the contribution of the industry to international trade is much wider than the trade turnover of the industry product. The added value is created both directly by commodity producers and by subjects of related industries (wholesale trade, transport, communications). The multiplier effect of FSIEC's interaction with other industries is expressed in an increase in the gross value of exports and imports by more than 50%. It is expected that the production of paper, the most technologically advanced product in the sector, provides the largest contribution to the formation of the industry's added value. The North American Free Trade Area (NAFTA) is the leader in both value and employment [13].

3 Results and Discussion

The export potential of the Russian economy is mainly associated with its raw materials sector. The model of increasing national wealth solely through the export of natural assets or their derivatives with low added value is contrary to the ideology of sustainable development. The development of a model

for the formation and development of the export potential of the industry involves the definition of goods of export specialization. With regard to Russian forest sector, in the context of the concept of sustainable development, key factors should be taken into account:

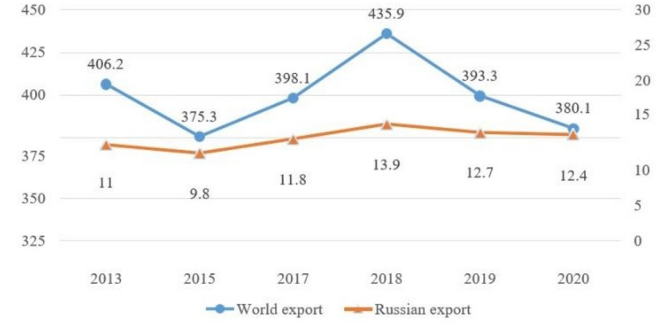
firstly, the basic resource of the sector is a natural asset, its reserves are significant and renewabl (specificity of the sectoral resource);

secondly, the high diversification of the industry product leads to a significant variability in strategies and development models, the technical and technological possibilities for improving the industry product have not been exhausted;

thirdly, the resource and technological potential of the territorial sectoral complexes varies significantly, the geographical location determines the features of the regional export policy (heterogeneity of spatial development).

Customs statistics for 2013-2020 were used to identify export specialization goods of the forest sector of the Federal Districts (macro-regions) of Russia [14] (fig. 1).

The initial period of the time interval is the last year preceding a protracted economic crisis driven by geopolitical events and exacerbated by global epidemiological restrictions. An assessment of the export dynamics over the specified period makes it possible to establish the impact of external trade sanctions, internal regulatory and managerial influences, adaptation measures (including customs and tariff policy) on the development of the export potential of the forest sector of the federal districts of the Russian Federation. The dynamics of exports of the total industry product of the Russian forest sector repeats the trends in world forest exports: the lowest values were noted in 2015, the maximum volumes were reached in 2018. Russian exports are characterized by higher sensitivity - export volatility: fluctuations in the Russian export growth index exceed world values throughout the entire observation interval (fig. 1). The share of Russian industry exports in world industry exports increased to 3.3% by 2020.



Growth index	2015	2017	2018	2019	2020
World export	0.92	1.06	1.10	0.92	0.95
Russian export	1.20	0.90	1.18	0.91	0.97

Fig. 1. Dynamics of the cost volumes of exports of the forest sector industry product,billion US dollars.

The RCEA calculation of the total industry product of the Federal Districts showed the involvementof all macroregions of Russia in the global timber trade (fig. 2).

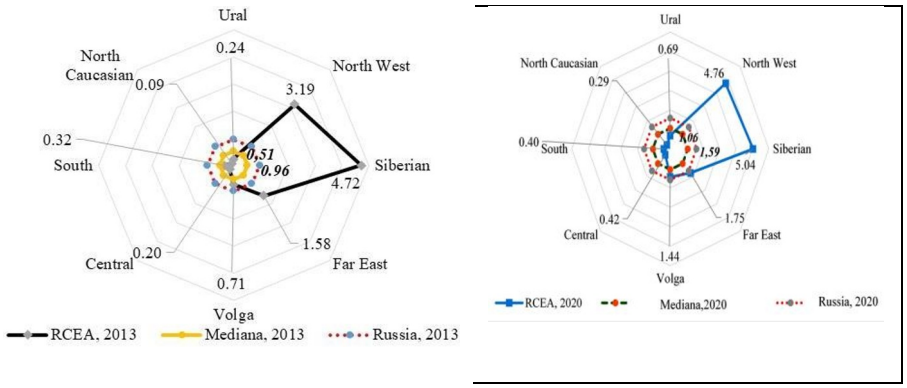


Fig. 2. Revealed comparative export advantage of the total industry product of the forest sector ofthe Federal Districts of the Russian Federation.

The accumulation of comparative export advantages by the Russian forest sector by 2020 is obvious.The median RCEA value of the forest sector product more than doubled from 0.51 (no comparative advantage) to 1.06 (there is). The use of median values increases the reliability of comparing the RCEAof the Federal District with the average Russian level. The geographic diversification of the forest sectorof the Russian economy is identical: both in 2013 and 2020 (as well as throughout the entire eight-yearperiod), the RCEA value of the Siberian, Northwestern, Far Eastern and Volga Federal Districts exceedsthe median value. In 2013, only three of the regions listed (with the exception of the Volga Federal District) have comparative export advantages in the global market for the total industry product. In 2020,the RCEA of the Volga District already exceeds one.

RCEA of the sectoral product of the Russian forest sector from 0.96 in 2013, close to the world level(one), by 2020 rises to 1.59. The general positive dynamics is obvious: the value

of the index is increasing in all districts. The Urals Federal District showed the highest growth rate, however, the value of 2020 is below the optimal one (0.69).

The leading region is the Siberian Federal District. However, it is he who demonstrates the lowest growth rate in 2013-2020 (3.3%). As a result, the backlog of the Northwestern Federal District is reduced from 1.53 to 0.28 points. The development of the forest sector of the Siberian Federal District is more typical of an extensive model: an increase in exports occurs as a result of increasing production and sales in the segment of processed timber with low and medium added value.

The assessment of the commodity diversification of Russian forest sector was carried out on the basis of an assessment of the dynamics of the index of comparative export advantage for the main commoditygroups (fig. 3).

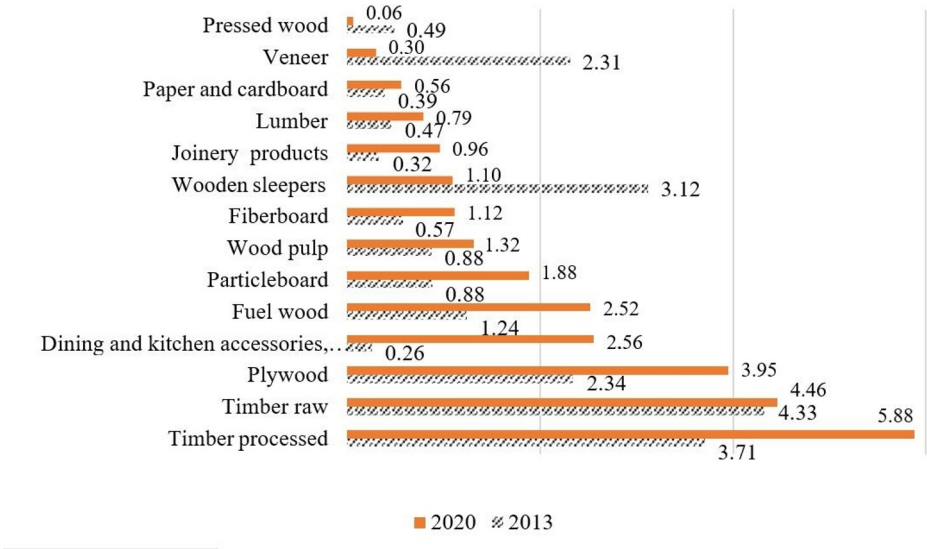


Fig. 3. Dynamics of Revealed comparative export advantage of the disaggregated forest sector industry product of the Russian Federation.

The most dynamically developing commodity segments are processed timber, plywood, tableware and kitchen utensils, particle boards - segments that form mainly the average level of added value. The high-tech paper and paperboard segment shows a sub-optimal RCEA value, rising from 0.39 to 0.56 by 2020.

The universality of Revealed comparative export advantage reflects its close correlation with the importance of the industry for the development of the socio-economic system (Table 1).

The advantage of RCEA over the share of exports of the industry product of the forest sector in the exports of the region is its multiplicative nature of interpretation.

Table 1. The relationship between the dynamics of the share of exports and Revealed comparative export advantage of the Federal Districts of Russia in 2013-2020.

Year	Siberian	North West	Far East	Volga	Central	Ural	South	North Caucasian
The share of exports of the forest sector industry product in the Federal District exports								
2013	10.30	6.96	3.46	1.54	0.44	0.52	0.70	0.20
2015	10.71	8.31	4.13	2.05	0.71	0.99	0.92	0.22
2017	11.51	9.64	4.75	2.88	0.80	0.96	1.00	0.58
2019	9.95	9.00	3.94	3.34	0.77	0.86	0.75	0.60
2020	11.29	10.66	3.92	3.22	0.95	1.54	0.89	0.65
RCEA								
2013	4.72	3.19	1.58	0.71	0.20	0.24	0.32	0.09
2015	4.60	3.57	1.78	0.88	0.30	0.43	0.40	0.10
2017	5.02	4.20	2.07	1.26	0.35	0.42	0.44	0.25
2019	4.52	4.08	1.79	1.51	0.35	0.39	0.34	0.27
2020	5.04	4.76	1.75	1.44	0.42	0.69	0.40	0.29
Correlation	0.904	0.988	0.98 4	0.99 7	0.99 6	0.99 8	0.99 4	0.99 9

Identification of directions for changing commodity specialization and diversification of the regionalforest sector is of fundamental importance for the development and adjustment of sectoral developmentstrategies (Table 2) [14].

Table 2. Goods of export specialization (RCEA).

Federal District	2013	2020
Siberian	Timber processed (31.2), Timber raw (25.4)	Timber processed (30.5), Timberraw (13.4)
North West	Wood pulp (15.3), Newsprint (12.2)	Timber processed (15.0), Fuel wood (13.6)
Far East	Timber raw (27.9), Veneer (24.1)	Timber raw (24.4), Veneer (20.9)
Volga	Newsprint (11.6), Plywood (4.3)	Plywood (9.8), Wooden sleepers (2.4)
Central	Wooden sleepers (2.3), Plywood (1.1)	Plywood (1.8), Fiberboard (1.7)
Ural	Veneer (6.7)	Wooden sleepers (5.0), Timber processed (4.5)
South	Timber processed (2.5)	Timber processed (1.8)
North Caucasian	Lumber (1.9)	Fiberboard (1.6)

The decrease in RCEA of low value added commodity segments (in particular, raw timber in the Far Eastern Federal District and Siberian Federal District) is offset by an increase in the indicator in medium value added segments. At the same time, there is a drop in the index in high-tech segments (newsprint in the Volga Federal District and the Northwestern Federal District). The dynamics of the export potential of the Russian forest sector and its territorial components is positive. Unfavorable

trends are observed in certain product segments. The level of technological specialization of Russian timber sector exports is not high enough.

An increase in the share of high value-added goods in total sectoral exports determines the relationship between the development of the export potential of the forest sector and the objectives of sustainable sectoral development.

E.L. Andreeva sees the essence of the export potential in the ability of a business entity to transform its resources into a competitive product and move into a higher quality state in the process of foreign economic activity. The author does not specify the parameters of growth in the quality of the socio- economic system, defines the export potential as an organic part of the national economy and a kind of integral phenomenon. This approach is not accurate enough. Quite rightly E.L. Andreeva visualizes the export potential in the context (within the "frame") of national interests, focuses on the fact that the export potential of the elements of the national economy (industries, territories, companies) is a tool for achieving competitive advantages, achieving sustainable development goals [11,15].

The task of increasing the sustainability of sectoral development is solved using various economic, statistical and mathematical methods, focusing on the need to combine socio-economic and environmental effects and consequences [16, 17, 18].

I.L. Lyubimov, D.G. Mirakyan associates the prospects for developing export potential with geographic diversification and access to "wealthy commodity markets", as well as using economies of scale. The authors are skeptical about the role of reindustrialization and import substitution, and prefer an export-oriented industrial policy [9]. This approach is traditional in an open economy, but requires significant adjustments in the current geopolitical environment, characterized by strict protective and restrictive measures against Russia and Belarus.

The index of economic complexity is positioned by A.K. Moiseev and P.A. Bondarenko as a rating indicator and a tool for clustering countries. Their remark about the existence of an analogy between the structure of exports of countries belonging to the same cluster is fair. An even closer correlation is observed when studying the comparative advantages of regional industry formations (sectors of the economy, industries, activities of individual regions or their associations - macroregions) [10].

The reliability of RCEA-models and ECI-models significantly on the content of the statistical material - the type of trade classification (degree of its detail): as a rule, complex goods are significantly diversified, and the index values may differ. The error is minimized by lengthening the time series and calculating the average values of ECI and RCEA for a cluster of countries (regions, macroregions, etc.). This circumstance was taken into account when determining the comparative advantages of the forest sectors of the Federal Districts of Russia.

4 Conclusions

The depletion of non-renewable resources, the excess of the rate of extraction of renewable resources over the rate of their recovery, combined with a high share of low value-added goods in Russian exports, are constraining factors for the realization of export potential, but also areas of likely growth in the export potential of the Russian economy and its industries.

The generalization of theoretical and methodological approaches to assessing the export potential of socio-economic systems made it possible to analyze the commodity and geographical diversification of the forest sector of Russian Federation districts. The export specialization products of the forest sector

of the Russian regions were identified, the insufficient level of resource potential use and the narrow specialization of most forested regions in the trade in low value-added products were stated.

The multiplicative nature of the interpretation of the results of the RCEA assessment makes it possible to obtain comprehensive information. It is an analytical basis for the development and adjustment of strategies for territorial and sectoral development.

The sustainable development of sectoral structures is ensured by their ability to generate added value that is in demand in an environment external to the structure itself, which does not exclude the development of high-tech intra-industry turnover as part of the import substitution policy. Measures of customs and tax regulation, investment and credit instruments are aimed at stimulating the technological segment of the forest sector. The economic projection of the concept of sustainable sectoral development involves a balance of export-oriented and import-substituting strategies.

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