The Assessment of Spatial Shifts in National Timber Industry under the Influence of Institutional Changes

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Abstract. In the article the changes in production parameters of a national forest complex which have taken place in ten years since the beginning of reforms in this segment of economy are analyzed. The hypothesis is investigated: as the institutional decisions directed to change of product structure of a forest complex towards increase in a share of production of more advanced processing have influenced redistribution in space of timber industry production. The tool of a research is assessment of change of timber use degree on federal districts by means of the index of structural shifts prior to the beginning of the reform period and after ten years and also measurement of indexes of changes of contributions of regional timber industry productions to key indicators of a national forest complex. Conclusions about the happened spatial transformations in a national forest complex are drawn.

1 Introduction
The spatial organization of a forest complex of Russia is caused by unevenness of distribution of forest resources, a location of domestic and foreign wood product markets, existence of infrastructure. Various influence of these factors defines features of response of regional timber industries to introduction of institutional changes.

In Russia since 2007 there was a number of the changes in timber export policy and timber industry policy directed to stimulation of increase in production with high value added. Among changes which have exerted impact on parameters of a forest complex it is possible to designate increase in a customs export tariff on the row wood and also providing preferences at implementation of investment projects on wood processing development [1]. Their influence has affected as parameters of a national forest complex, and his regional segments. The purpose of article is assessment of spatial effects of influence of institutional changes in the national forest complex.

2 Relevance and scientific importance of a research
The relevance of a research is caused by need of assessment of spatial effects of realization of economic policy for the real sector, A. Granberg wrote about importance of what [2]. Within this problem a number of publications has been devoted to a research of spatial shifts in economy and to influence on these shifts of changes in industries [3-6]. In relation to a subject of this article the task consists in the analysis of spatial shifts in timber industry production under the influence of institutional transformations in the last decade. Enough researches is devoted to the analysis of institutional changes and their economic consequences in a modern forest complex of Russia: questions of efficiency of the state decisions [7], reactions to these solutions of parameters both national [8-10], and regional forest complexes [11-15] are considered. Researches on identification of dependence between spatial distribution of forest resources and the economic activity were conducted [16], estimates of influence of forest policy on change of spatial placement of timber industry production were carried out [17]. Generally conducted researches were based on the qualitative description of the happening changes, their quantitative measurement is relevant.
3 Methodology

The hypothesis is investigated: as the institutional decisions directed to change of product structure of a forest complex towards increase in a share of production of more advanced processing have influenced redistribution in space of timber industry production.

The period of a research covers 2007-2016 – the period of activization of state policy concerning a forest complex for the purpose of stimulation of development of wood processing industry and reduction of export of round wood.

As criterion of realization of the purpose of this policy it is possible to consider increase in a share of wood processing production in timber industry production on federal districts for last ten years. One of the indicators characterizing implementation of this criterion is the indicator of change of timber use degree. This indicator is calculated on the basis of statistical data on physical volumes of production of wood processing and logging and norms of a consumption of wood for production of different types of wood products.

Object of a research is the forest complex at the national level and level of the federal districts (FD). Seven federal districts are considered, excepting the North Caucasian Federal District which indicators of timber industry production are included in similar indicators of Southern Federal District. It is caused by the fact that base for comparison is 2007 when the North Caucasian Federal District hasn't been allocated in separate territorial unit yet and territorial subjects of the federation entering him were included into Southern Federal District.

For assessment of change of timber use degree the method of structural shifts is used [18-19]. Calculation of the index of structural shifts in a forest complex is carried out on a formula

\[ I_{TUD}^{i} = \left( D_{i}^{t} - D_{i}^{0} \right) / D_{i}^{0}, \] (1)

where \( I_{TUD}^{i} \) – the index of structural shift in the forest complex of the \( i \)-th federal district on timber use degree; \( D_{i}^{t}, D_{i}^{0} \) – indicator of timber use degree in the \( i \)-th federal district in the year \( t \) and basic year \( 0 \) (\( i = 1, \ldots, 7 \)). If \( I_{TUD}^{i} > 0 \), structural shift positive, if \( I_{TUD}^{i} < 0 \), negative.

To measure redistribution in space of production of timber industry production for the studied period, indexes of changes of federal districts contributions to key indicators of a national forest complex are used. Change of a share of each FD in the national output of a certain type of timber industry production is calculated.

4 Findings and Discussion

Calculations of indexes of structural shifts for timber use degree at the national level and in federal districts have allowed to receive a number of estimates (See fig. 1).

Fig. 1. Indexes of structural shifts of indexes of structural shifts for on timber use degree in the Russian Federation and federal districts in 2007 – 2016

Note: I – Central FD; II – the Northwestern FD; III – Southern FD; IV – the Volga FD; V – Ural FD; VI – Siberian FD; VII – the Far Eastern FD.
In the figure 1 it is visible that in general in the Russian Federation timber use degree has practically not changed for the studied period. Same situation has developed in Siberian FD. Timber use degree in Far Eastern FD has as much as possible increased that is explained by the low "starting level" (in 2007 the share of processing of the prepared wood in the district was no more than 20%), but also, strong reduction of logging volume.

Timber use degree in Northwestern Federal District has decreased. Northwestern and Siberian FD were and remain national leaders of timber industry production. The total share of two of these districts in the all-Russian production of the round wood and wood processing production makes more than 65%, and on production of cellulose the share reaches 90%. It means that Northwestern and Siberian Federal Districts in many respects define the all-Russian trends in a forest complex. Therefore the negative index of timber use degree in Northwestern FD caused by reduction of wood processing because of increase in export of round wood within quotas on the lowered export duties (as a concession of Russia to EU countries at entry in WTO) [1], has had significant effect on lack of growth of a national indicator of wood processing.

It is analyzed as contributions of federal districts to timber industry production of the country in connection with wood processing stimulation policy have changed (See Table 1). Assessment was carried out on the round wood and the sawn wood as they are main types of the timber industry production manufactured in Russia.

Table 1. Indexes of changes of contributions of federal districts to key indicators of a national forest complex (2007 and 2016), percent

| Federal District | Share of the federal district in production of the round wood 2007 | Share of the federal district in production of the round wood 2016 | Change of a share 2007-2016 | Share of the federal district in production of the sawn wood 2007 | Share of the federal district in production of the sawn wood 2016 | Change of a share 2007-2016 |
|------------------|---------------------------------------------------------------|---------------------------------------------------------------|-----------------------------|---------------------------------------------------------------|---------------------------------------------------------------|-----------------------------|
| Central          | 9.4                                                          | 7.8                                                          | -1.7                        | 9.3                                                          | 7.2                                                          | -2.1                        |
| Northwestern     | 29.2                                                         | 30.7                                                         | 1.5                         | 28.7                                                         | 28.3                                                         | -0.4                        |
| Southern         | 0.5                                                          | 0.4                                                          | -0.1                        | 1.3                                                          | 0.8                                                          | -0.5                        |
| Volga            | 12.1                                                         | 13.2                                                         | 1.1                         | 15.8                                                         | 12.3                                                         | -3.5                        |
| Ural             | 5.8                                                          | 2.5                                                          | -3.2                        | 7.3                                                          | 3.7                                                          | -3.7                        |
| Siberian         | 30.8                                                         | 36.4                                                         | 5.6                         | 32.1                                                         | 40.6                                                         | 8.5                         |
| Far Eastern      | 12.1                                                         | 9.0                                                          | -3.1                        | 5.5                                                          | 7.2                                                          | 1.7                         |
| the Russian      | 100                                                          | 100                                                          | 100                         | 100                                                          | 100                                                          | 100                         |

The analysis of table 1 shows that for the studied period Northwestern and Siberian federal districts have increased the contribution to production of the round wood, especially Siberian FD. That is, there was a spatial shift in favor of the main producers which have strengthened the positions. Respectively, it has caused the general increase in production of the round wood across in the country, though insignificant (less than 2% in ten years). The greatest reduction has concerned Ural, Far Eastern and Southern federal districts. But, as share of Southern and Ural FD was and remains low, it hasn't exerted special impact on indicators of a national forest complex. More significant negative effect on the all-Russian indicators was exerted by reduction of logging in Far Eastern Federal District (on 25% for the studied period).

As for production of sawn wood, only two of seven districts have significantly increased the deposits to national production – Far Eastern and Siberian FD. On other districts there was a reduction in production and, respectively, their shares that has as a result caused falling of national production of
sawn wood. Remain leaders Northwestern and Siberian FD, especially the last one that has strengthened shift of the Russian wood processing production to this district.

In general, such weak response of a forest complex to stimulation of development of wood processing isn't an exclusive situation for Russia. The timber processing industries in many countries are generally slow to adopt new technology. This is partly related to small size of businesses, lack of investments, market imperfections, a lack of knowledge to operate and benefit from new technology, and the informal nature of the industry [20].

Russia also belongs to such countries. Rather rich forest resources in a northwest part of the country and also in Siberia and in the Far East provide competitiveness of the Russian timber industry production of low level of processing in foreign markets. The main importers of the Russian timber production are China and Finland, dictating raw structure of demand for the Russian forest business which is difficult for overcoming. Therefore it is important to create competitive advantages of domestic production of processing.

5 Conclusion
Summing up the result of a research it is possible to draw the following conclusion. As the forest complex is tied to forest resources of territories, it defines differences in conditions of operation of his regional segments, and respectively, influences features of response of these segments to institutional changes that is reflected in key parameters of their development. It, in turn, influences changes in placement of timber industry production in space and, respectively, the general indicators of activity of a national forest complex.

Our assessment has shown that for last ten years there were practically no positive changes in a national forest complex from positions of increase in a share of production with high value added. Timber use degree in space of Russia hasn't increased, it in fact means that the state policy on development of wood processing hasn't been realized. As for spatial shifts, estimates have shown that there was a further concentration of timber industry production in Siberian and Northwestern federal districts, the being leaders of branch. At the same time raw orientation of the Russian forest complex have remained and even has amplified what increase in production of the round wood testifies to.

In our opinion, it is in many respects caused by the fact that institutional impact on the Russian forest complex is neutralized by more significant influence of the external demand and raw factors. Therefore the system of preferences from the state, including tax, budgetary, customs and other tools for wood processing development, has to consider need of stimulation of domestic forest business to be built in the international cooperation relations with production with high value added, and not just with raw materials.

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