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To cite this article: G Butko *et al* 2021 *IOP Conf. Ser.: Earth Environ. Sci.* **875** 012072

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Assessment of the innovative potential of the timber enterprises in the Russian Ural region

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Abstract. The development and implementation of innovations are becoming integral functions of a modern industrial enterprise. The author has developed an author's approach to assessing the innovation potential of forest enterprises through the analysis of financial sustainability and the ability to cover their own liabilities to achieve competitive advantages. The methodological research toolkit uses the competitiveness rating of economic entities of the timber industry complex of the Ural region, formed according to several economic indicators of the market segment occupied by the enterprise, the quality of its products, innovation activity and its efficiency, the degree of financial support, innovative research projects and the availability and effectiveness of facilities, as the resulting indicator. The economic profit indicator used to assess the effectiveness of enterprises is positive if the enterprise has managed to earn more than the profitability of similar enterprises, i.e. the enterprise implements innovative projects, which in turn bring additional competitive advantages. The developed approach makes it possible to identify and evaluate the most significant elements of the innovative potential of the enterprise on the basis of the rating assessment, thus allowing to take into account the specific features of the enterprise and its operating conditions.

1. Introduction

The desire of micro- and macroeconomic actors to create sustainable competitive advantages in a highly dynamic and changing external environment leads to significant structural transformations in market relations and the resulting emergence of new processes and institutional actors.

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At the level of firms and industries (micro-level) these are processes of inter-corporate integration and internationalisation of production, leading to the formation of vertically and horizontally integrated structures, various kinds of strategic alliances, as well as industry and inter-corporate associations actively defending and lobbying the interests of their participants. At the country level (macro-level), these are regional integration processes leading to the formation of regional associations [1]. Under these conditions, the cluster approach can become a new vector of economic growth of large industrialized regions with a high degree of production concentration. In this case, the efficiency of regional industrial complexes becomes the basic factor for their sustainable functioning and competitive development. The formation and development of advantages contributes to accelerated economic growth, increased welfare of the population, more efficient and rational use of the resource potential of the territory, including forest resources. The solution of these problems requires new practical actions aimed at the formation and development of regional sectoral complexes, which require theoretical justification.

Today, one of the leading complexes of the Russian economy is the timber industry complex. The timber industry complex is a special structural element of the economy with great potential for further development due to the availability of high-quality raw materials and traditions of forest production. Therefore, the central issue in the development of the complex is the choice of ways to realize its existing potential [2,3]

A specific feature of the forestry industry is the lack of support during the years of reforms with full financial support for the gas, oil, and other base industries. Network economy and then digitalization replaced the period of transformations.

The most typical is the continuity of innovative and creative modernization from the obsolete ‘seriously lagging economy’. In the context of a decrease in production volumes, the cluster structure of the economy based on innovative support and the creation of a state and regional system for its development are important components of the formation of a modern innovative economy.

Many authors [4,5] consider issues of the import substitution policy in the forest industry complex and the industrial sector of Russia’s economy in general. Attention is focused on the innovative approach to this problem. And the market of intellectual and creative resources has a special place. Existing approaches for the assessment of competitiveness are not always appropriate. So, it is necessary to clarify certain areas of scientific concepts and their practical approbation.

In recent years scholars from different scientific schools have been studying the issue of managing competitiveness actively [6]. Occurring social and economic transformations in our country impose relevance of problem identification caused by the consequences of the financial and economic crises. The authors reasonably explain such indicators as the competitiveness of forest capital and the value of the organization within the forest complex.

Nowadays, there are no universal methods that allow managing competitiveness. The investigations devoted to the issue pay close attention to the analysis of the structure of markets, the study of the competitive environment, and types of competition, therefore, it is appropriate to consider competitiveness in terms of the release of innovative products.

At present, the State Programme ‘Digital Economy of the Russian Federation’ has been approved, which says: ‘... digital data is a principal factor of production in the areas of social and economic activity, which increase the country’s competitiveness, the quality of life of citizens, and ensure economic growth and national sovereignty’ [7]. At international conferences in the digital transformation, Russia still occupies only 1.5% of the global volume of the Internet of Things, and its share in forestry is furthermore lower. The inflow of investments will increase digitalization.

Taking into account the current trends, a model focused on lean innovations is promising for certain territories of the region, in particular, this is typical for areas with unstable economies and low living standards of the population. At the same time, lean innovation is understood as innovative solutions that combine low cost of project implementation and high resource efficiency in conjunction with price competitiveness and the possibility of implementation in mass production. The emergence of products created on the basis of lean innovations makes it possible to have a positive impact on the

quality of life of the population, and especially its low-income strata. Currently, much attention is paid to the competitiveness of the region's economy from the point of view of its economic security. The competitiveness of the region's economy is both a prerequisite and a consequence of the conditions for ensuring economic security. This is evidenced by scientists [8].

Acceleration of digital transformations in the forestry complex and the formation of a digital economic sector of the economy largely depends on the investment climate in the country and an increase in investment.

The focus is on the directions of cluster policy at the level of municipal authorities. At this stage, the leading direction of cluster policy is the development of municipal strategy for the development of a territorial cluster based on the creation of a register of projects of local enterprises with competitive advantages.

Federal level clusters are to implement the long-term strategies to achieve sustainable development at the macroeconomic level. Municipal level clusters are to implement a strategy for achieving sustainable economic development of the territory. The strategy of territorial cluster development consolidates the scheme of territorial planning and the forecast model of economic and infrastructural development of the territory.

Peculiarities of the formation of the forest industry cluster of the Ural Federal District and the Sverdlovsk region:

- the emerging core of processing enterprises focused mainly on the processing of hardwood (plywood factories, factories for the production of wood chipboard and others);
- a priority for forest energy (production of thermal energy and standardized wood fuel) and wood and chemical (charcoal) industries, taking into account the large share of low-grade deciduous wood;
- the development of woodworking based on the growth of the volume of industrial wooden house building in the region;
- an increase in the number of small contracted logging industries.

The current priority in the development of the Ural Federal District is moving from industrial and raw materials to industrial and innovative, transport, bioenergy, tourism and recreation, and manufacturing industries. In the future, it is planned to implement innovative directions of cluster policy – sustainable forest management based on intensive forestry in the territory of neighboring districts.

Today there is an active search for methods to assess the innovation potential of enterprises of the timber industry complex; at the same time the development of integral indicators, which provide the most complete picture of the state of innovation activity of an enterprise, is being carried out. Currently, economic science can distinguish three concepts of categorizing the phenomenon of innovation potential. The first concept is resource-based and implies a collective characteristic of resources that create conditions for the implementation of innovation activity. The second concept, institutional, considers potential as a manifestation of existing production relations. And the third one, process (productive), expresses the ability of productive forces to create, disseminate and use innovations, i.e. to achieve a certain effect.

Innovations can be divided into competitive and non-competitive innovations. A non-competitive innovation is an innovation, the implementation of which will result in economic losses for the enterprise. A competitive innovation is the creation and implementation of an innovation, the practical use of which will be characterised by a higher degree of satisfaction of some needs compared to another similar innovation. 'An innovation will be competitive if there is feasible novelty, - sustainable demand and economic or social efficiency. In other words, an innovation will be competitive if it fulfils the following requirements: it is new and useful; the innovation is active; it has an economic or social impact; and it is in sustainable demand. An innovation-oriented enterprise strategy can only be successful and effective if the innovation itself is competitive, whether it is its own or acquired [8-10].

The relevance of the study is due to the underdeveloped methodological issues of assessing the innovation potential of forest enterprises, and the need for further research in this area.

The purpose of the study is to assess the innovation potential of a forestry enterprise by analysing its financial sustainability and ability to cover its own liabilities in order to achieve a competitive advantage.

2. Methods

Theoretical basis of the study consists of works and monographic studies in the field of cluster approach and innovation development. The implementation of cluster policy contributes to the growth of business competitiveness due to the potential of effective interaction between the participants of the complex. Geographically close proximity of companies, increased access to innovation, technology, know-how, specialized services and highly qualified personnel, as well as reduced transaction costs provide the preconditions for the implementation of joint cooperation projects and productive competition [11,12]. Innovation management is oriented towards the future direction of enterprises and aims at ensuring compatibility with organisational environmental policy, which is the driving force behind an environmentally oriented enterprise strategy based on the principle of sustainable development [13].

Given the complex and heterogeneous structure of the modern regional timber industry complex, it is necessary to determine the methodological apparatus for further research. The formation of regional concepts of timber industry complex development should be based on a number of conceptual provisions that include the basic principles of many sciences. The theory of state management of the economy makes it possible to clearly articulate the place, role, direction and scope of state influence in the development of regional timber industry complexes.

The cluster approach suggests that in building the concept of development of regional timber industry complexes it is also advisable to use the cluster form of organization of economic activity, since the cluster-based economy is a model of competitive and investment-attractive economy that provides a high level and quality of life for the population and involves not only large enterprises in the region, but also small and medium businesses in the production process. The theory of innovative development is one of the key ones, because modern successful development of all industries and sectors of the economy relies on innovative projects.

The concept of sustainable development is of paramount importance in shaping the concept and model for the development of timber industry complexes in Russian regions, as in modern conditions the innovative type of development is identified with the principles of sustainable forest management and integrated wood use. Theories and concepts of competitiveness suggest that the development of the timber industry complex in a competitive environment is impossible without the compliance of enterprises and their products with the requirements of international standards, which are dictated by the market. The theory of regional economy management shows the key points in the construction of the concept and model of the timber industry complex development taking into account the peculiarities and directions of development of a particular region - its location. Therefore, the development programmes for regional timber industry complexes should contain a comprehensive analysis of development factors. Strategic management theories determine the possibility of applying various tools of managing complex economic systems by the type of holdings, clusters, associations, etc.

In order to identify typical timber industry organisations, methods of multivariate statistical analysis were used. To determine the resulting variant of the timber industry complex development of the Ural region, methods of economic and mathematical modelling have been proposed.

The study also applies a business value management approach. The entire management process is generally presented as a cycle of a continuously recurring set of standard procedures, including the following steps: assessing the current state of the business and the environment; comparison of the current state with a benchmark using the criterion of value and adjustment of

the latter if necessary; development of control actions; applying these to the business. The cycle then repeats [14].

Value is aligned with the management cycle as follows.

The first step is to identify the current state of the business and environment, using the business value as a criterion. This is done by determining: the market value of the business using the discounted cash flow 'as is' method. A prerequisite here is the preservation of existing business trends without taking into account any significant perturbations caused, for example, by the implementation of new projects; an analysis of the financial performance of the organisation is carried out to identify factors influencing and controlling the value.

The second step compares the current state of the business with the benchmark, based on the condition of maximising the value criterion. This step includes: an analysis of the feasibility of value drivers based on internal resources; a comparison of the value of the business obtained earlier with internal improvements and the value with external restructuring. A decision on whether to undertake specific reorganisation procedures is made on the basis of an analysis of business value growth; changes in the structure and forms of financing of the business. In this step related to financial restructuring, in addition to the structure and forms, the possibilities of influencing the amount of debt and its value are investigated.

In the third stage of value criterion management, future values of business performance are projected, specific measures to achieve the planned state are identified – the most important areas of control impacts are selected. The best restructuring option is identified by comparing the value of the business 'as is' (without improvements) with the value of the business as a result of the selected restructuring strategies. The maximum gap will determine the best outcome.

Stage four implements the action plan. The steps outlined above form the basis of the business management mechanism and are used as a mechanism to increase value for shareholders.

According to this approach, it follows that business (enterprise) value management is possible based on the analysis of its sensitivity to factors.

Any variable that significantly affects corporate value can be considered a key factor. Both the company's pricing policy, the state of production facilities, the level of competition in the industry, the reliability of suppliers, regulations issued by the government, the general economic situation in the country, and the business reputation, the company's ideology, its style, openness, the impact on the psychological relations that develop between people and the impact on the environment can be considered as key value factors.

The authors propose to consider the environmental factor as a key factor that affects the final value of the enterprise. In order to test this hypothesis, a model of the interaction of enterprise value growth depending on its environmental component was constructed. This model is the ratio of the effects from various uses of forest resources to the costs arising in the enterprise as a result of forest management, taking into account the implementation of measures to reduce the negative impact on the environment.

The object of the study is timber industry enterprises of the Ural region.

3. Results and discussion

Analyzing the current state of the timber industry complex of the region by the example of the Ural region, the author states that in studies of recent years the state and development of the timber industry complex in Russia and abroad has been determined by various groups of indicators, somehow reflecting the competitiveness of the timber industry complex. Researchers so far do not have a general methodology for assessing the competitiveness of the timber industry complex and, accordingly, no approaches have been formulated to assess the impact of factors that determine the competitiveness of a particular economic entity within a territorial formation.

The most general approach is to assess the competitiveness of the timber industry complex by determining the dynamics of production of timber industry products. Thus it is possible to consider the data on the timber industry complex of Russia as a whole for the last 5-10 years, comparing with them the data on the timber industry complex of regions and the data of the countries competing with Russia

in the world market (for example, Finland, Poland, China), by the following parameters: production volumes by product; production volumes per capita; level of use of average annual production capacity of organizations for production of certain products (in percentage); dynamics of export and import of certain types of the timber industry complex products. The authors propose to use the following indicators to compile the competitiveness rating of enterprises and organizations of the timber industry complex of the Ural region (table 1): the market segment occupied by the enterprise and the organization; quality of products; innovation activity and its effectiveness; the degree of financial support for scientific innovation projects; availability and efficiency of the material base.

Table 1. Rating of ensuring competitiveness by means of innovative development.

Objects	**Indicators**					**Rank**	**Rating**
	1	**2**	**3**	**4**	**5**		
LLC 'Serov-les'	1	0.923	0.911	1	0.895	2.172	2
LLC 'Karpinsk-les'	0.905	1	0.889	0.897	0.858	2.133	3
LLC 'Lobva-Les'	0.725	0.787	0.723	0.693	0.712	1.908	7
a division of the experimental timber industry complex	0.738	0.798	0.815	0.832	0.689	1.968	6
Ural State Forestry Association	0.825	0.734	0.813	0.908	0.726	2.001	5
Production Association 'Ural State Forest Complex'	0.538	0.645	0.713	0.656	0.708	1.806	9
Production Association 'Ural State Woodworking Centre'	0.632	0.652	0.698	0.634	0.643	1.805	10
Production Association 'Ural State Centre for Ecological Expertise'	0.995	0.991	0.949	0.975	0.932	2.200	1
LLC 'Sarginsky forestry'	0.897	0.901	0.936	0.898	0.836	2.114	4
LLC 'Talitsa-les'	0.638	0.728	0.776	0.699	0.712	1.869	8
Scientific Association 'Ural Timber Industry Centre'	0.438	0.412	0.527	0.312	0.12	1.345	11
LLC 'Stroy-Eco-Dom'	0.325	0.312	0.412	0.218	0.09	1.167	12

The investigations relate to those objects having principal positions by the estimation of the market shares in the region for the production of innovative products and services. The primary data taken into account are tabulated and ranked by the number of points, in accordance with the weight of each of the parameters. The sum of all points gives an idea of both effectively organized innovation activities and the availability of flexibility in the context of local and global changes in the economy.

One of the models for the development of the national innovation system is to support from the state only the formation of fundamental knowledge in university and academic science, a limited set of technologies that are important for maintaining the country's defense capability. It also focuses on the

development of favorable conditions, including infrastructural ones, to motivate enterprises and organizations to initiate their research and scientific developments for their further implementation in production and commercialization. Foreign scientific papers emphasize important factors and perspectives on why innovations in sustainable development can increase the competitiveness of firms.

First, innovations in sustainable development can lead to more effective processes by reducing the use of raw materials and electricity consumption.

Second, they can improve product quality and efficiency by reducing material use, using less hazardous materials and packaging.

Third, they can improve enterprise management.

The situation changes for the stability of the relationship between the object and its participants having competition in a rapidly changing market. In this connection, it is necessary to form innovative strategies regularly considering the maintenance of priority areas of development for a long time.

In this context competitive advantages are revealed within competitiveness as an integral indicator demonstrating continuous and sustainable development in the condition of the modern market.

For the forest complex, competitiveness is the ability of an economic entity to be distinguished from other objects due to the prevailing social and economic indicators that characterize a high competitive status and innovative capacity.

At the same time, the innovative capacity is evaluated by analyses of the financial stability of the enterprise and its ability to ensure coverage of its obligations.

The amount of surplus (+) or shortage (–) of own working capital is determined by the formula:

$$\pm E_S = \left(I_S - F\right) - Z \tag{1}$$

where *Es* –availability of own working capital; *Is* – sources of own funds (conclusion of section III of the balance sheet 'Capital and reserves'); *F* – fixed assets and investments (conclusion of section I of the balance sheet 'Non-current assets'); *Z* – inventory and costs (section II of the balance sheet 'Current assets').

To calculate this indicator, the objects with the highest rating are accepted (table 1). The result is shown in table 2.

Table 2. Results of calculation of surplus/shortage of own working capital (RUB million).

Objects	**Research period**		
	2017	**2018**	**2019**
		Sources of own funds	
A (rating 1)	1,388,427.3	1,355,807.4	1,434,431.0
B (rating 2)	864,177.9	1,134,098.0	1,301,245.8
C (rating 3)	1,962,065.7	2,823,168.9	3,503,363.8
D (rating 4)	3,354,211.6	4,982,924.7	5,213,358.9

In this context, competitive advantages are manifested through competitiveness as an integral indicator, reflecting continuous and sustainable development in the modern market conditions. At the same time, innovation potential is assessed through the analysis of financial sustainability of the forestry complex enterprise and its ability to ensure the coverage of its own liabilities.

Based on the study, we can argue that a forestry enterprise can be considered investment-attractive if it has increased its value over the past period.

Given the current trends, a model focused on lean innovation is promising for certain territories of the region, in particular for areas with unstable economies and low living standards of the population. In this case, lean innovation means innovative solutions that combine low project implementation costs and high resource efficiency together with price competitiveness and the possibility of

introduction into mass production. The emergence of products created on the basis of lean innovations makes it possible to have a positive impact on the quality of life of the population, especially its low-income strata.

The leading direction of cluster policy at the level of municipal authorities is the elaboration of a municipal strategy for development of a territorial cluster based on the creation of a register of projects of local enterprises, whose products will be competitive on domestic and foreign markets.

Clusters at the federal level are designed to implement a long-term strategy to achieve stable development at the macroeconomic level. Municipal level clusters are designed to implement the strategy of achieving sustainable economic development of the territory. The territorial cluster development strategy consolidates the territorial planning scheme and the forecast model of economic and infrastructure development of the territory. The current priority in the development of the territory of the Ural Federal District is shifting from industrial-raw materials to industrial-innovative, transport, bio-energy, tourist-recreational, processing industries. In the future, it is planned to implement innovative directions of cluster policy: sustainable forest management based on intensive forestry in the territory of neighbouring districts.

4. Conclusion

Practical activities have shown that in order to attract capital investment in the development of the timber industry, an adequate methodology for assessing the innovation potential of enterprises operating in the timber industry complex is needed.

An assessment of an enterprise's innovation capabilities comprehensively reveals the opportunities for business development in a given segment, taking into account its cluster or production capacity and infrastructure. There is a need to assess the industry's innovation potential, i.e. the industry's ability to develop better or to identify 'growth points'. The innovative potential of an industry determines the further development of the sub-sectors within it, which creates a prospect for the development of the most progressive industries.

The developed approach makes it possible to identify and assess the most significant elements of innovation potential of an enterprise on the basis of a rating assessment, thus allowing to take into account the specific properties of the enterprise itself and its operating conditions. The universality of this methodology makes it possible to assess enterprises of different sectoral orientation and compare them with each other in order to identify the level of innovation development.

The importance of the innovative cluster approach in the forest industry complex is undeniable. The effectiveness of clustering the economy based on the innovative transformation of small businesses is obvious. The current stage of the innovation economy is called 'Industry 4.0'. It is based on progressive technologies. This digital foundation completely changes the economic basis of the economy to an ultra-dynamic pace.

The formation of local 'growth points' of a territorial industrial cluster should take into account the presence of an anchor forest enterprise with elements of innovation.

Lack of innovation leads to a decrease in competitiveness of an enterprise and its consequent liquidation. In addition, industrial enterprises in the cluster cannot gain additional competitive advantages in this situation by accelerating the turnover of their resources.

The economic profit indicator used to assess the performance of cluster infrastructure enterprises is positive if the enterprise has managed to earn more than the profitability of similar enterprises, i.e. the enterprise implements innovative projects, which in turn bring additional competitive advantages. The value added indicator is positive if the enterprise has managed to earn more than the return on alternative investments. Possible ways of increasing the value added indicator are: 1) increasing profits with the same amount of capital used; 2) decreasing the amount of capital used while keeping profits at the same level; 3) decreasing the cost of capital.

The above-mentioned ways of increasing added value are implemented in specific innovative activities carried out by cluster infrastructure enterprises. If the indicator is chosen by the enterprise as a criterion for assessing the effectiveness of innovation management, the objective is to increase the

value of this criterion. Thus, applying the value added indicator to the level of innovation management efficiency will contribute to improving the performance of the industrial cluster as a whole.

The proposed tools to improve the competitiveness management system on the basis of innovative development of the timber industry complex act as an alternative to the export orientation of the forest sector of the economy and as an alternative to the expected return on borrowed capital.

To implement the mechanism of modernization of the regional economy based on cluster approaches, it is necessary to have a state-approved industrial policy that includes a clear mechanism of state support for clusters, taking into account the Russian specifics of the forest complex.

The development of the region as a priority should be based on projects that give the maximum return with the use of limited investment resources. The priorities of innovative development should, among other things, be subordinated to the development goals of the regional system.

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