

The assessment of the factors influencing the development of the market of industrial roundwood in the APR countries

Irina Matveevna Romanova and Elena Viktorovna Noskova

Far Eastern Federal University, Suhanova Street, 8, Vladivostok, 690950, Russia

Abstract. The article offers the author's approach to the assessment of the factors influencing the formation and development of the market of industrial roundwood. The special feature of the proposed approach is to build a system of factors based on a combination of a content-analysis of the economic literature on the problem of research and empirical approach. Within this approach a list of factors influencing the development and formation of the market has been determined, the algorithm of holding an expert poll, determination of a rating of factors has been proposed. This approach has been tested on the example of the market of industrial roundwood of the certain APR (Asia-Pacific Region) countries (the USA, China, Russia).

[Romanova I.M., Noskova E.V. **The assessment of the factors influencing the development of the market of industrial roundwood in the APR countries.** *Life Sci J* 2014;11(12s):681-685] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 148

Keywords: factors, expert assessment, rating, market, industrial roundwood

Introduction

The situation in the international market of industrial roundwood develops under the influence of various in force and duration of action economic, social, natural and political factors. The classification and assessment of the factors, influencing the formation and development of the market of industrial roundwood of the APR countries, will allow to determine the main trends conducive to the effective development of the studied market and also to reveal the reasons hindering the development of this market. In addition, the factors, measured in quantitative indices, will allow to make the forecast of development of state of the market of industrial roundwood adjusted to the degree and nature of influence of these factors. The problems of classification and assessment of various factors, influencing the formation and development of commodity markets and services, are mentioned in the works of Agarwal J, Malhotra Naresh K., Bolton R. [1], Graefe A. [2], Armstrong J. Scott [2], Kotler P. [3], Caslione J. [3], Lee Nancy R. [4], Golubkov E. P. [5], Kalinina A. E. [6], Kondratyev N. D. [7] and others. However, the existing classifications of factors don't take into account the branch features of individual markets [7, 8]. The problems of qualitative assessment of the factors have been insufficiently elaborated [9, 10]. All this confirms the relevance of the declared subject of the research and a weak level of its study in the economic literature.

Methods

We suggest that the assessment of the factors, influencing the formation and development of the market of industrial roundwood of the APR countries, should be carried out in two stages (fig. 1).

To begin with, it is necessary, basing on the secondary information, to determine the list of such factors and to classify them, then – to make an assessment of the revealed factors by means of a method of expert poll.

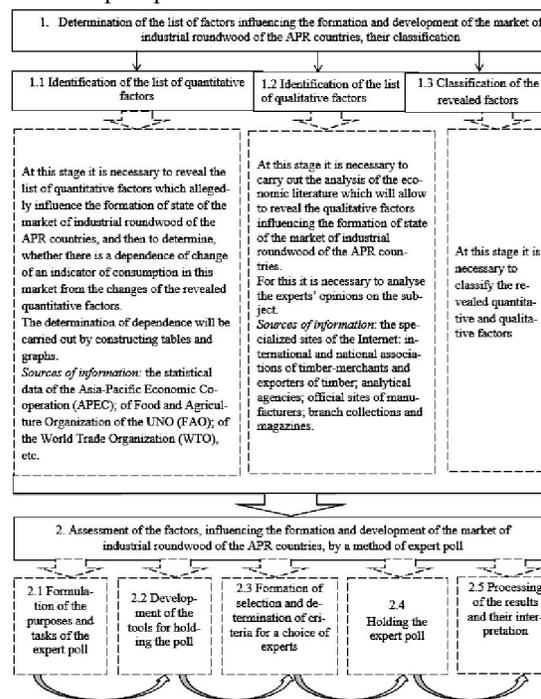


Figure 1: The stages of assessment of the factors influencing the formation and development of the market of industrial roundwood of the APR countries, the author's development

In the conditions of turbulence of the environment it is rather difficult to assess the factors with the use of economic-mathematical methods. In

such cases for the assessment of the factors we recommend to use the expert methods, which allow to receive the qualitative and quantitative information on the revealed list of factors from the professional participants of the studied market. As a whole, the process of preparation and holding the expert poll can be presented in the form of the following scheme (fig. 2).

The detailed characteristics of the allocated stages are presented in the tab. (tab.1).

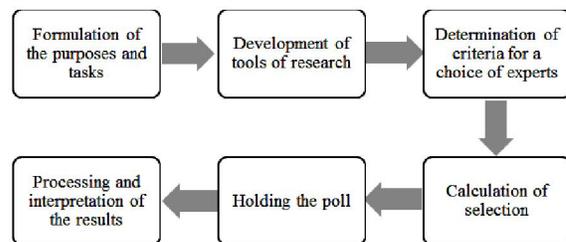


Figure 2: Process of holding the expert poll

Table 1. Stages of preparation and holding the expert poll for assessment of the factors influencing the formation and development of the market of industrial roundwood of the APR countries

Stage	Characteristics
Formulation of a purpose of the poll	To characterize the factors influencing the formation and development of the market of industrial roundwood of the APR countries.
Formulation of the tasks of the poll	1) To assess a degree of influence of the revealed factors on the formation and development of the market of industrial roundwood of the APR countries; 2) To determine the nature of influence of the revealed factors.
Development of the tools of research	The tools for holding the poll are a questionnaire.
Determination of criteria for a choice of experts	The professional participants of the market of forest products with length of work in timber and woodworking industries from five years, namely heads and top managers of enterprises act as experts in the studied market.
Calculation of selection	The volume of selection makes 12 experts.
Holding the poll	Correspondence form.
Processing of the results	The calculation of the weight coefficients, determination of the consistency of the experts' opinions, interpretation of the received results.

The weight coefficients are determined by calculating a share of an average among the specified by all the experts' value in the sum of all average values. To calculate the weight on the criterion first we shall determine the average weight [5]:

$$W_k = \frac{\sum_{n=1}^N W_{kn}}{N},$$

where W_k is the average weight on the criterion k ; N – the number of experts that determine the weight on the criterion k ; W_{kn} – the weight given by n expert to the criterion k .

Then the weight of the criterion is normalized so that the sum of all criteria must be 100%:

$$W_k^{ns} = \frac{W_k}{\sum_{k=1}^K W_k} \times 100\%,$$

where W_k^{ns} – the average weight on the criterion k , %; k – the total number of criteria.

The body

In accordance with the proposed methods at the 1st stage of the research the list of factors influencing the development of the market of industrial roundwood has been determined. Such quantitatively measurable factors as a dollar exchange rate, gross domestic product, population and also the volume of goods output and price influence the formation and development of most global markets. Within this research the influence of the above-mentioned factors on the formation and development of the market of industrial roundwood of the certain APR countries – the main consumers of industrial roundwood in the region (the USA, China and Russia (tab. 2) has been analysed.

The data presented in table 2 shows that the trends of change of indicators are similar; this allows to make a conclusion about the presence of the influence of the revealed factors on the volume of consumption of industrial roundwood.

Besides quantitative factors, also the list of qualitative factors, for determination of which it is necessary to analyse experts' opinions on the basis of the content-analysis of secondary sources of information, has influence on the formation and development of the market of industrial roundwood. As the secondary sources of information the specialized sites of the Internet are used: sites of international and national associations of timber-merchants and exporters of timber; of analytical agencies; official sites of manufacturers; branch collections and magazines.

Table 2. Dynamics of indices of the factors influencing the formation and development of the market of industrial roundwood of the certain APR countries, 2007-2012 [11, 12]

Country/Year	Volume of consumer demand	GDP on the basis of purchasing power	Volume of output of industrial roundwood	Population	Price for industrial roundwood
The USA:	1.00	1.00	1.00	1.00	1.00
2007					
2008	0.91	1.02	0.89	1.009	1.12
2009	0.68	1.004	0.77	1.018	1.006
2010	0.73	1.04	0.74	1.028	1.091
2011	0.76	1.08	0.78	1.038	1.23
2012	0.87	1.16	0.88	1.043	1.233
China: 2007	1.00	1.00	1.00	1.00	1.00
2008	0.97	1.12	1.034	1.005	1.08
2009	0.98	1.23	1.022	1.01	1.04
2010	1.05	1.37	1.019	1.015	1.053
2011	1.06	1.53	1.012	1.02	1.186
2012	1.09	1.67	1.27	1.024	1.25
Russia: 2007	1.00	1.00	1.00	1.00	1.00
2008	0.87	1.07	0.84	0.99	1.03
2009	0.81	0.93	0.69	0.99	1.02
2010	1.02	1.04	0.84	0.98	1.04
2011	1.17	1.1	1.12	0.97	1.12
2012	1.29	1.17	1.09	1.007	1.27

It should be noted that when determining the list of factors it is necessary to consider the features of the studied market, territorial coverage of the market (internal, national, regional, world, global) and also availability of accessible and reliable information about the market.

The determination of the list of factors influencing the formation and development of the market of industrial roundwood of the APR countries and also their further classification and systematization are necessary to ensure a complex and system approach to research.

On the basis of analysis of specifics of the market of industrial roundwood of the APR countries, dynamics of indicators of supply and demand and price level in this market and also revelations of the reasons of change of the main indicators we allocate the groups and list of the factors influencing the formation and development of the market: social and economic, state and legal, scientific and technical, natural and climatic, infrastructure (tab. 3).

Table 3. The list of factors influencing the formation and development of the market of industrial roundwood of the APR countries, the author's development.

Group	Factors
Social and economic	1. GDP on the basis of purchasing power. 2. Volume of output of industrial roundwood in the region. 3. Dollar exchange rate. 4. Population. 5. Price for industrial roundwood in the region. 6. Volume of construction in the region.
State and legal	7. Activities of the international public interest environmental groups (measures limiting deforestation in a number of the countries and also the actions preventing the illegal export of forest products). 8. State regulation of the timber industry in the region (resolutions of tax and customs services; customs duties and licensing).
Scientific and technical	9. Level of development of the world technologies, researches and development in the fields of timber and woodworking industries.
Natural-climatic	10. Raw material resources of the region. 11. Natural and climatic and ecological conditions of the region. 12. Natural and climatic disasters.
Infrastructure	13. Organization of exhibitions-sales and contests of forest products in the region. 14. Organization of exchanges, auctions in the region and timber trading platforms on the Internet.

Then the expert assessment of the above-mentioned factors has been carried out. The results of the assessment of the importance of the factors are shown in fig. 3.



Figure 3: The weight coefficients of the factors influencing the formation and development of the market of industrial roundwood of the APR countries, 2014, the author's development

It should be noted that the most significant factors, by the results of the expert assessment, are the state regulation of the timber industry, natural and climatic conditions and disasters in the region, raw material resources of the region (area of afforestations, water resources, etc.) and also the volume of construction (as a factor of formation of a derived demand) and volume of output of industrial roundwood. After determining the weight coefficients of the factors, influencing the formation and development of the market of industrial roundwood of the APR countries, it is advisable to determine the nature of influence of the revealed factors on a scale, where 1 – is a strong negative influence of a factor, 2 – moderate negative, 3 – weak negative, 4 – a factor has no influence, 5 – weak positive, 6 – moderate positive, 7 – strong positive. On the basis of the received results the average

assessment of nature of influence of each factor has been calculated (fig. 4).

The data of the figure testifies that such factors as the natural and climatic and ecological conditions and also raw material resources of the region have strong positive influence on the formation of state of the market of industrial roundwood of the APR countries.

As the factors, having strong negative influence, the experts have allocated the state regulation of the timber industry in the region (constraining measures) and natural and climatic disasters (fires, floods, storms, etc.).

Then the nature of influence of the allocated factors taking into account the weight coefficients (tab. 4) has been determined, the rating of factors has been built.

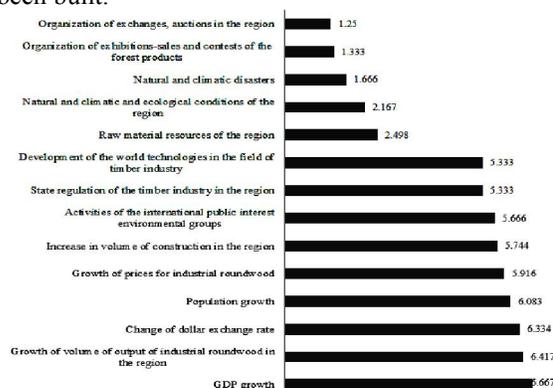


Figure 4: Distribution of experts' assessments concerning the nature of influence of the factors on the formation and development of the market of industrial roundwood of the APR countries, 2014, points, the author's development

Table 4. Rating of the factors influencing the formation and development of the market of industrial roundwood of the APR countries, 2014, the author's development

Factor	The weighed assessment, point.	Place
Natural and climatic and ecological conditions of the region	63.34	1
Raw material resources of the region	57.64	2
Growth of volume of output of industrial roundwood in the region	52.31	3
Increase in volume of construction in the region	47.46	4
GDP growth	43.78	5
Development of the world technologies in the field of timber industry	29.52	6
Organization of exchanges, auctions in the region	28.15	7
Organization of exhibitions-sales and contests of the forest products in the region	26.63	8
Population growth	17.07	9
Growth of prices for industrial roundwood	16.04	10
Activities of the international public interest environmental groups	13.16	11
Natural and climatic disasters	12.8	12
State regulation of the timber industry in the region	12.25	13
Change of dollar exchange rate	11.49	14

The received data is representative what is confirmed by the results of checking the coherence of experts' opinions on the basis of calculation of a coefficient of concordance (0.704).

On the basis of the expert assessment the following conclusions can be made:

– the favourable natural and climatic conditions and high level of raw material resources of the region have the most positive influence on the formation and development of the market;

– the limitations from the public interest environmental groups, state regulation and also natural and climatic disasters and changes of dollar exchange rate have the most negative influence on the formation and development of the market.

Conclusions

Within this research the tools of the assessment of the factors influencing the formation and development of the market of industrial roundwood have been offered. The approbation of the offered tools on the basis of the expert poll on the example of the market of industrial roundwood of the certain APR countries has been carried out. The rating of the revealed factors has been built.

The results of the expert assessment are of interest to the professional participants of the market, and the developed tools will promote the development of the theory and methodology of research of the branch markets.

Corresponding Author:

Dr. Romanova Irina Matveevna
Far Eastern Federal University
Suhanova Street, 8, Vladivostok, 690950, Russia

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7/28/2014