487

Int. J Sup. Chain. Mgt   Vol. 8, No. 6, December 2019

Efficiency Assessment of Supply Chain Policy in Fishing Industry Functioning at the Mesolevel

Elena V. Levkina[1], Natalya Yu. Titova[2]

[1] *Department of Economics and Management, Vladivostok State University of Economics and Service, Russia*
[1]*a553330@mail.ru*
[2]*natalya.Titova@vvsu.ru*

Abstract— Fishery of Primorsky Krai is one of the largest in the system of fishing industry of the Far East and Russia in general that is caused by resource base, an advantageous geopolitical position, favorable climatic conditions in supply chain policy. Increase in efficiency of fishing industry is one of the most important economic problems of Russia and the priority purpose of Primorsky Krai. Recently there was a set of techniques, developments and offers on assessment and increase in efficiency of activity of economic subjects. However, most of them are based on calculation of the indicators reflecting results of activity of the enterprises which function not in a fish complex. Considering structural features of branch systems, the special relevance is acquired by a research of efficiency of economic entities at the mesolevel. In the article author's methodical approach of assessment of efficiency of functioning of fishing industry at the mesolevel is presented. This approach allows not only to estimate in a complex all components of efficiency, but also to consider branch specifics of fishing industry.

Keywords— efficiency, supply chain policy, criterion, indicator, mesolevel, fishing industry.

1. Introduction

A supply chain is a network of facilities and distribution entities (Suppliers, manufacturers, distributor, retailers) that performs the function of procurement of raw materials, transformation of raw materials into intermediate and finished products and distribution of finished products to customers. Existence of considerable number of treatments and classifications of efficiency, the keen interest in which is caused by a multiaspectiveness, multidimensionality of this category and branch specifics of its application, significantly complicates scientific and practical search in this area.

More and more scientists focus attention on studying of content of efficiency in relation to a concrete sectoral system. Studying efficiency of activity of set of the enterprises within one industry group, not only the content of economic category,

but also criteria, indicators of effective functioning of the industry is specified.

Researches of efficiency of the fishing enterprises at the mesolevel which includes the fishing fleet, port and repair bases, the enterprises specializing in cultivation and processing of fish, the net manufacturing plants, warehouse farms and scientific research institute of fishery [1-7] is of special interest. Authors offer to consider efficiency of functioning of fishing industry on the level of management and to subdivide on:
- efficiency of products - the individual level;
- efficiency of the enterprise - microlevel;
- efficiency of the industry, the region - mesolevel;
- efficiency of national economy in general – macrolevel [8].

According to offered by structure of a concept of efficiency of functioning of branch systems, it is possible to determine each level as follows:
- individual efficiency of products – the efficiency characterizing partial result of production from each type of products. This efficiency is characterized by many indicators, such as unit profit of a certain look, profitability of a type of products, size of cost reduction in dynamics on a unit of production, etc. Both producers and consumers are interested in ensuring efficiency of products. In total the individual efficiency by each type of products reflects efficiency of production activity of the enterprise, that is microlevel;
- it is necessary to understand efficiency of activity of the separate enterprises, namely enterprises of fishing industry as mesoefficiency [9-11];
- it is necessary to understand efficiency of functioning of this industry for national economy as macroefficiency in general.

To define "efficiency at the mesolevel", it is necessary to study experience of scientists and their interpretation of this definition.

O.V. Sidnin, studying the social and labor sphere of the Russian economy, considers the mesolevel as the level of regions of the country. According to the author, exactly, mesolevel is a base for determination of parameters of labor market [12]. O.V. Inshakov understands economic space of productions of a sector or interindustry complex, the region, financial and industrial groups or group

488

Int. J Sup. Chain. Mgt   Vol. 8, No. 6, December 2019

of local regions as mesolevel [13]. B.A. Chub determines the mesolevel as an independent segment of economy as which main subjects in the conditions of transition to market economy and varieties of forms of ownership act: branch of economy, territorial subject of the federation (region), corporation [14- 25]. The short review of the given approaches showed that now objectively there is a need for specification of content of efficiency at the mesolevel. In this regard, mesolevel can be determined as a set of the independent economic subjects integrated by certain territorial or technological communications for implementation of a uniform type of activity.

Each of the listed concepts of efficiency of functioning of sectoral systems is described by the set of indicators and respectively process of increase in efficiency demands approach, specific to each level. Use of the interconnected indicators which are comprehensively characterizing a state and results of activity of the fishing enterprises will allow carrying out the complex analysis of efficiency of fishing industry as type of activity.

2.   Methodology

According to author's approach to assessment of efficiency of fishing industry, differentiation of criteria and indicators on components depending on evaluation criterion is offered:

- technological (production) efficiency,
- market efficiency,
- financial efficiency,
- investment efficiency;
- innovative efficiency;
- social efficiency;
- labor efficiency;
- budgetary efficiency.

Each block of efficiency will be defined by the corresponding criteria and to be measured by certain indicators. For example, the technological (production) efficiency assumes the analysis of a state and efficiency of use of material and technical resources. For fishing industry a relevant indicator is the level of development of quotas which value has to aspire to 1 [15, 24].

Analyzing modern approaches to the choice of indicators on each component and factors of cost efficiency of fishing industry, it should be noted lack of the conventional opinion on the matter. Therefore, a contradiction of views, both among theorists, and among practicians, gives debatability to a case in point. According to the existing methodical approaches, the author grouped indicators for assessment of efficiency of fishing industry. This set of indicators is presented in the table 1 which allows estimating efficiency of an economic system at the mesolevel taking into account sectoral specifics.

Table 1. Indicators of assessment of efficiency of fishing industry

Efficiency of fishing industry	Indicator	Economic sense
Production	Level of development of industrial quotas	Characterizes overall performance of fishery
	Coefficient of change of the outputs	Reflects dynamics of the outputs fishing industry
	Coefficient of change of the output of fish products per capita in this territory by the previous period	Extent of increase real productions of fish products in the region
	Coefficient of updating of the range of fish products	Reflects intensity of horizontal diversification of the fishing enterprises
	Coefficient of change of capital productivity of fixed assets of fishing industry	Characterizes dynamics of efficiency of use of fixed assets of fishing industry
	Profitability ratio of fixed assets	Shows the profit of fishing industry counting on 1 ruble of fixed assets
	Coefficient of updating of fixed assets	Characterizes the level of updating of fixed assets of fishing industry; reflects intensity of financial policy of the fishing enterprises for modernization and expansion of production
Market	Specialization coefficient	Shows dynamics of the fishing enterprises in the regional market
	Concentration coefficient	Reflects a market share of the largest fishing enterprises in turnover of fishing industry
	Index of expansion of fishing industry	Characterizes appeal of fishing industry to enterprise structures
	Share of fishing industry in formation of regional GDP	Shows a contribution of fishing industry to formation of regional GDP
	Share of a turnover of the regional fishing enterprises in the market	Shows market activity of fishing industry of the region in the market of food products
	Coefficient of appeal of activity to small business, natural/money equivalent	Characterizes a share of small business in turnover of fishing industry
	Import dependence coefficient	Reflects an import share in a total turnover of fishing industry
	Coefficient of change of consumption of fish products per capita	Criterion of food safety of the region; the indicator of the state statistical observation of

489

Int. J Sup. Chain. Mgt   Vol. 8, No. 6, December 2019

		the standard of living of the population showing dynamics of average per capita consumption of fish products.
Financial	Level of the profitable fishing enterprises in the market	Shows a share of the profitable enterprises of fishing industry
	Industry average indicator of profitability of sales	Characterizes the level of profitability of the enterprises of fishing industry
	Coefficient of change of profit of the fishing enterprises to number working in fishing industry	Estimates dynamics of a ratio of the profit falling on one working in fishing industry
Investment	Coefficient of change of the sum of the investments falling on the profit of fishing industry	Characterizes dynamics of a ratio of investment resources in development of fishing industry and the cumulative profit of the fishing enterprises
	Ratio of investments into fishing industry to the sum of investment investments in development of the region	Shows a share of investments of fishing industry in total amount on edge
Innovative	Level of innovative activity of the fishing enterprises	Shows degree of focus of the industry on introduction of innovations for the purpose of increase in efficiency of fishing industry
	The volume of innovative fish products from total production	Reflects how introduced innovative solutions and technologies are absorbed in fishing industry and are implemented in highly effective production of fish products
	Specific weight of the fishing enterprises in fishery which are carrying out technological innovations	Shows degree of focus of fishing industry on introduction of innovations for the purpose of increase in efficiency of its functioning
Social	Coefficient of involvement of workers	Assessment of gain of employment in fishing industry
	Coefficient of change of social payments of the enterprises counting on 1 worker of fishing industry	Estimates social efficiency of fishing industry on providing workers with social guarantees
	Coefficient of change of GDP of fishing industry per capita	Reflects dynamics of economic activity of fishing industry for the region
Working	Coefficient of change of average annual level of compensation of workers of fishing industry	Shows dynamics of average annual level of compensation of workers of fishing industry
	Coefficient of change of average annual number of workers of fishing industry	Characterizes dynamics of number of workers of fishing industry
	Coefficient of change of labor productivity in fishing industry	Reflects dynamics of efficiency of use of human resources in fishing industry
	Coefficient of a ratio of the salary of workers of fishing industry to the average level on the region	Shows a ratio of the salary of workers of fishing industry to the average salary on the region
Budget	Level of tax revenues of the fishing enterprises in the budget	Characterizes a contribution of fishing industry to formation of tax budget revenues
	Coefficient of tax efficiency	Shows a ratio of balanced financial result and total amount of tax payments of fishing industry

Source: [complied by the author]

3.   Results and Discussion

The supply chain demonstrates the full range of activities which are required to bring a product or service from conception, through the different phases of production and delivery to final consumers. Using statistical data of Primorsky Krai for 2009-2016 the efficiency of fishing industry according to an author's technique of assessment of efficiency of functioning of fishing industry of the region is defined, data are provided in table 2 [17-22].

Table 2. Assessment of efficiency of fishing industry of Primorsky Krai for 2009-2016

Value	2009	2010	2011	2012	2013	2014	2015	2016
Level of development of industrial quotas	0,730	0,820	0,900	0,919	0,924	0,890	0,878	0,961
Coefficient of change of the outputs	1,025	1,069	1,158	0,972	1,002	1,062	0,916	1,065
Coefficient of change of the output of fish products per capita this territory by the previous period	1,074	1,070	1,159	0,974	1,006	1,064	0,918	1,068
Coefficient of updating of the range of fish products	0,033	0,040	0,043	0,055	0,063	0,055	0,054	0,050
Coefficient of change of capital productivity of fixed assets of fishing industry	1,007	1,182	1,049	0,617	1,289	1,011	1,279	0,852
Coefficient of profitability of fixed assets	0,424	0,422	0,524	0,411	0,353	0,220	0,814	0,893

490

Int. J Sup. Chain. Mgt   Vol. 8, No. 6, December 2019

Coefficient of updating of fixed assets	0,036	0,089	0,127	0,304	0,077	0,111	0,160	0,166
Specialization coefficient	0,990	0,990	0,980	0,970	0,940	0,950	0,950	0,930
Concentration coefficient	0,150	0,140	0,130	0,130	0,120	0,110	0,120	0,130
Index of expansion of fishing industry	0,860	0,840	0,820	0,800	0,780	0,810	0,780	0,77
Share of fishing industry in formation of regional GDP	0,058	0,051	0,046	0,04	0,050	0,054	0,063	0,063
Share of a turnover of the regional fishing enterprises in the market	0,145	0,143	0,139	0,137	0,142	0,146	0,147	0,147
Coefficient of appeal of activity to small business, natural/money equivalent	0,850	0,860	0,870	0,870	0,880	0,890	0,880	0,870
Importozavisimost coefficient	0,442	0,354	0,376	0,396	0,349	0,306	0,330	0,380
Coefficient of change of consumption of fish products per capita	1,010	1,017	1,013	1,007	1,013	0,981	0,979	0,892
Level of the profitable fishing enterprises in the market	0,709	0,680	0,726	0,727	0,715	0,716	0,727	0,715
Industry average indicator of profitability of sales	0,189	0,171	0,197	0,198	0,155	0,099	0,253	0,323
Coefficient of change of profit of the fishing enterprises to number working in fishing industry	0,945	0,958	1,390	1,193	0,867	0,702	3,785	1,340
Coefficient of change of the sum of the investments falling on the profit of fishing industry	1,622	0,349	1,195	0,504	1,780	0,362	2,178	1,149
Ratio of investments into fishing industry to the sum of investment investments in development of the region	0,003	0,005	0,003	0,012	0,007	0,01	0,022	0,028
Level of innovative activity of the fishing enterprises	0,214	0,243	0,256	0,298	0,327	0,486	0,423	0,420
The volume of innovative fish products from total production	0,198	0,228	0,240	0,250	0,250	0,270	0,240	0,228
Specific weight of the fishing enterprises in fishery which are carrying out technological innovations	0,125	0,238	0,240	0,280	0,290	0,330	0,280	0,260
Coefficient of change of average annual level of compensation of workers of fishing industry	1,172	1,163	1,143	1,131	1,093	1,187	1,230	1,175
Coefficient of change of average annual number of workers of fishing industry	0,896	0,971	0,910	0,945	1,035	0,978	1,039	0,979
Coefficient of change of labor productivity in fishing industry	1,022	1,055	1,212	1,184	1,108	1,096	1,486	1,048
Coefficient of a ratio of the salary of workers of fishing industry to the average level on the region	1,011	1,021	1,046	1,052	1,053	1,155	1,364	1,500
Coefficient of involvement of workers	0,100	0,090	0,080	0,070	0,060	0,050	0,060	0,050
Coefficient of change of social payments of the enterprises counting on 1 worker of fishing industry	1,150	1,140	1,130	1,130	1,070	1,170	1,180	1,190
Coefficient of change of GDP of fishing industry per capita	1,094	1,109	1,065	0,890	1,354	1,112	1,364	1,023
Level of tax revenues of the fishing enterprises in the budget	0,080	0,020	0,030	0,050	0,050	0,060	0,030	0,039
Coefficient of tax efficiency	0,675	1,375	1,443	1,603	1,348	0,942	5,020	4,560

Source: compiled by author

The greatest effectiveness is reached on the indicators connected with catch and import substitution. Almost fivefold increase in profit of fishing industry in 2016 in comparison with 2014 is caused by effect of devaluation of ruble and reduction of number of the unprofitable enterprises in fishery from 28.4% to 8.3%. Falling of profitability in 2010 - 2014 against the background of growth of revenue (in rubles) meant loss of efficiency and competitiveness of the producer (expenses grew quicker than revenue) [10].

By results of the analysis of indicators of commodity turnover and profit it is possible to note that values of these indicators considerably increased for the analyzed period, showing growth of efficiency according to the traditional systems of its assessment. At the same time both nominal, and real indicators showed steady positive dynamics, and growth of commodity turnover of fishing industry in 2015-2016 in a money equivalent predetermined growth in incomes per capita that is additional demonstration of growth of efficiency according to its traditional concepts.

Tax burden of fishing industry decreases within the last 8 years. Within the Russian economy tax burden of fishing industry relatively is not high. Growth of tax revenues in 2016 is caused by growth of collecting income tax and single agricultural tax and personal income tax (partially) that is connected with devaluation of ruble.

491

Int. J Sup. Chain. Mgt   Vol. 8, No. 6, December 2019

Theoretically, consolidation of fishing industry has to be followed by growth of investments and productivities, increase in efficiency of sales; however in practice consolidation for the last 6 years did not result in the expected results.

For 2008-2014 fishing industry of Primorsky Krai stagnated, and its efficiency, at least, did not increase. The stated negative dynamics of some criteria indicators does not correspond to assessment of development of fishery as effective, determined by traditional indicators.

For return of the lost leader positions fishery of Primorsky Krai needs active state support. As the current mechanism of state support does not give the expected effect, it is necessary to strengthen policy of subsidizing, to develop the differentiated system of tax incentives, preferential bank crediting and preferential policy of tariffs of rail transportation. Such measures intensify implementation of investment and innovative projects that is unconditional, will expand production, will improve quality of the produced fish products, will strengthen innovative developments and will increase efficiency of fishing industry in general.

4.   Conclusion

This research provides a novel approach to developing and accessing supply chain management in fishing distribution. Summarizing all aforesaid, we will note that application of the system of indicators developed by the author allows controlling and considering changes of factors, to correct management decisions. Distinctive feature of the offered methical approach to assessment of efficiency of fishing industry functioning is following by the author to the principle of use of annually formed primary data which are contained in statistical regional reports that allows performing calculation of the corresponding indicators in the automatic mode with application of standard software.

Thus, application of the offered technique will not lead to increase in load of users, and will allow to provide the accuracy, relevance of information and in due time to take actions for increase in efficiency of fishing industry.

References

[1]   Korneyko, O.V. (2018) Government regulation's priority instruments of fishery enterprises in Russia. Espacios, 39 (48).

[2]   Titova N.Y., Vorozhbit O.Y. Development of fishery clusters in countries on the Pacific Rim// Azimuth of Scientific Research: Economics and Administration. 2017. Vol. 6. Iss 3 (20). P. 342-346.

[3]   Terenteva, T.V., Shashlo, N.V., Kuzubov, A.A. (2017) Conceptual approach to the process of strategic positioning of business entities of the fishing industry. Academy of Strategic Management Journal, 16 (Special Issue 2).

[4]   Terentyeva T.V., Vasilenko M.E., Titova N.Yu. (2019) Organizational and economic mechanism for sustainable development of Fishing Industry of the Primorsky territory: Cluster Approach. Dilemas contemporaneos-educacion politica y valores. Vol. 6. Special Issue: SI. Article Number: 132

[5]   Vorozhbit O. Y., Levkina Ye. V. Improving Scoring System of Performance Indicators of Industrial Systems at the Meso-Level. European Research Studies Journal. 2017 Volume XX, Issue 4B. P. 666-674.

[6]   Vorozhbit O. Y., Titova N.Yu., Kuzmicheva, I. A. (2018) Development of competitive advantage evaluation technique for industrial clusters on the basis of m. porter's national competitiveness model "Rhombus" transformation. Amazonia Investiga. Vol. 7. Iss. 13. PP. 308-321

[7]   Vorozhbit, O.Y., Titova, N.Y., Kuzmicheva, I.A., Shnaider, O.V. (2018) Quantitative assessment of Primorsky Krai fishery cluster competitiveness factors on the basis of the porter model transformation. Journal of Social Sciences Research. (Special Issue 5), pp. 350-357 (doi: 10.32861/jssr.spi5.350.357).

[8]   Levkina E.V. Efficiency as economic category and its classification (on the example of fishing industry)//Financial management. – 2017. - No. 1. – Page 10-16; URL: http://elibrary.ru/item.asp? id=28402133

[9]   Levkina E.V., Vasilenko M.E. Effectiveness of the fish industry: theory, methodology and practice//Online magazine Science of science. 2013. No. 6 (19). URL: http://cyberleninka.ru/article/n/effektivnost-rybnoy-otrasli-teoriya-metodologiya-i-praktika

[10]   Levkina E.V. Methodical aspects of management of efficiency of functioning of fishing industry (on the example of Primorsky Krai)// Azimuth of Scientific Research: Economics and Administration. 2019. T.8. No. 1(26). Page 197-201 (0.6 items of l./0.6)

[11]   Levkina E.V. Methodical approach to assessment of efficiency of functioning of fishing industry (on the example of Primorsky Krai)//Azimuth of Scientific Research: Economics and Administration. 2018. Volume 7. No. 1 of Page 157-160 (0.7 items of l./0.7)

[12]   Sidnin O.V. Economic restrictions of labor markets in Russia: macro - meso - and microlevels: The report at the All-Russian scientific and practical Internet conference

"Supply and Demand in Labour Market and Education Market in Regions of Russia". URL: http://labourmarket.ru/conf/reports.php

[13] Inshakova E.I. Megaregions: the theory and practice of identification in Megaeconomy / Inshakov E.I., Voloshin A.Yu. space. / Regional economy. South of Russia. 2013. No. 2. Page 16-21

[14] Chub B.A. The economic relations in subjects of mesolevel of national economy of Russia. Under the editorship of Dr.Econ.Sci. Bandurina V. V. – S-PB.: LLC NIAGARA. – 2003, 222 pages.

[15] Fishery of the Far East: current state and problems: Collection of materials of the International congress of fishermen (Vladivostok, on August 27-28, 2015). – Vladivostok: Varial publishing house, 2015. – 39

[16] Fishery complex of Primorsky Krai 2015: The collection with an analytical note / Primorskstat, 2015

[17] Fishery complex of Primorsky Krai 2016: The collection with an analytical note / Primorskstat, 2016

[18] Results of activity of Federal Agency for Fishery in 2016 and tasks for 2017. Board of Federal Agency for Fishery [Electronic resource]. – URL http://srps.ru/index.php/tekuschaja-dejatelnost.html

[19] Lelyukhin S. E. A fishing cluster as the instrument of effective management of a fishery complex of the Far East//Customs policy of Russia in the Far East. 2013. No. 3 (64). URL: http://cyberleninka.ru/article/n/rybopromyshlennyy-klaster-kak-instrument-effektivnogo-upravleniya-rybohozyaystvennym-kompleksom-dalnego-vostoka

[20] Titova N.Y., Terentyeva T.V., Vorozhbit O.Y. Sustainable development of fishing complex in Primorsky Krai via formation of territorial-sectoral industrial cluster // Azimuth of Scientific Research: Economics and Administration. 2016. Vol. 5. Iss. 2 (15). P. 53-57.

[21] Mardani, M., & Fallah, R. (2018). Comparison of Financial Leverage Ratio before and after the Use of Off-Balance Sheet Financing in Firms Listed in the Tehran Stock Exchange. *Dutch Journal of Finance and Management,* *2*(2), 53. https://doi.org/10.29333/djfm/5829

[22] Mazurova, E. (2017). Exploratory Analysis of the Factors Affecting Consumer Choice in E-Commerce: Conjoint Analysis. *Journal of Information Systems Engineering & Management,* *2*(2), 12. https://doi.org/10.20897/jisem.201712

[23] Estanesti, S., & Vazifeh, Z. (2017). The Relationship between conservatism and economic criteria, assessing financial performance of listed companies In Tehran Stock Exchange (2010-2014) . *UCT Journal of Management and Accounting Studies, 5*(2), 20-24.

[24] Ulandari, L., Amry, Z., & Saragih, S. (2019). Development of Learning Materials Based on Realistic Mathematics Education Approach to Improve Students' Mathematical Problem Solving Ability and Self-Efficacy. *International Electronic Journal of Mathematics Education, 14*(2), 375-383. https://doi.org/10.29333/iejme/5721

[25] Fauzi, M. A. (2018). Random Forest Approach for Sentiment Analysis in Indonesian. *Indonesian Journal of Electrical Engineering and Computer Science*, *12*(1), 46-50.