



RIGA TECHNICAL
UNIVERSITY

Inese Biukšāne

EVALUATION OF COMPETITIVENESS OF THE LATVIAN FISHERIES SECTOR IN THE FRAMEWORK OF THE CLUSTER

Summary of the Doctoral Thesis



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RIGA TECHNICAL UNIVERSITY
Faculty of Engineering Economics and Management
Institute of Civil Engineering and Real Estate Economics

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Doctoral Student of the Study Programme “Management and Economics”

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To be granted the scientific degree of Doctor of Economic Sciences, the present Doctoral Thesis has been submitted for the defence at the open meeting of RTU Promotion Council on 30 December 2019 10:00 at the Faculty of Engineering Economics and Management of Riga Technical University, 6 Kalnciema Street, Room 209.

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DECLARATION OF ACADEMIC INTEGRITY

I hereby declare that the Doctoral Thesis submitted for the review to Riga Technical University for the promotion to the scientific degree of Doctor of Economic Sciences is my own. I confirm that this Doctoral Thesis had not been submitted to any other university for the promotion to a scientific degree.

Inese Biukšāne _____ (signature)

Date: _____

The Doctoral Thesis has been written in Latvian. It consists of Introduction; 3 chapters; Conclusions and Proposals; 27 figures; 23 tables; 20 appendices; the total number of pages is 164, excluding annexes. The Bibliography contains 189 titles.

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USED ABBREVIATIONS

AREI	– Institute of Agricultural Resources and Economics
BIOR	– Institute of Food Safety, Animal Health and Environment ‘BIOR’
CFP	– Common Fisheries Policy
CSB	– Central Statistical Bureau
EFF	– European Fisheries Fund
EMFF	– European Maritime and Fisheries Fund
EU	– European Union
FLAG	– Fisheries Local Action Groups
FVS	– Food and Veterinary Service
LFICIS	– Latvian Fisheries Integrated Control and Information System
LULST	– Latvia University of Life Sciences and Technologies
MA	– Ministry of Agriculture
MEPRD	– Ministry of Environmental Protection and Regional Development
MF	– Ministry of Finance
NFN	– National Fisheries Network
OP	– Operational Programme
OPF 2007–2013	– Operational Programme for the Implementation of the European Fisheries Fund Support in Latvia for 2007–2013
OPFS 2014–2020	– Operational Programme for Fisheries and Sea 2014–2020
RSS	– Rural Support Service
SWOT	– Strengths, Weaknesses, Opportunities, and Threats analysis

INTRODUCTION

Fisheries have always played an important role in the development of Latvian economy. National fishery and fish production traditions are well-developed and mostly based on the local fish raw material resources from the Baltic Sea and the Gulf of Riga. Environmental pollution, adverse spawning conditions as well as intensive fishing and other factors have negative influence on fish stock; consequently, fishing quotas for the Baltic Sea and the stock of the available fish raw materials are reduced every year having negative impact on the activity of fishery and fish processing enterprises as well as development of areas important for the fisheries. Coastal areas are underpopulated and there is much non-agriculture land restricting the possibilities to do other alternative types of entrepreneurship, and consequently development of these areas is paid increasingly greater attention at the national level. The negative consequences related to environmental changes simultaneously increase the role of aquaculture sector in acquiring of fish resources. It is possible to develop aquaculture as an alternative source of fish raw material, where using the inland water fish resource base there are broad opportunities of supplementing the marketable fish stock thereby facilitating sustainable development of industrial fishery and processing, recreational fishery and fishing tourism. The territorial, surface and underground water resources located in the territory of Latvia and available to the aquaculture are evaluated as of good quality and sufficient to ensure doing and developing business. In the world, aquaculture is evaluated as highly productive, competitive and environmentally friendly sub-sector. Economic breakthrough in the fisheries sector of Latvia and the EU is related to aquaculture sector, consequently it is planned to implement a purposeful state and the EU policy for its development, simultaneously facilitating growth and employment in the coastal areas and other territories significant for fisheries.

The Common Fisheries Policy tends to ensure the activities of fisheries to be ecologically sustainable in the long term and managed according to the purpose of ensuring benefits in the socioeconomic and employment spheres. The policy by the EU determines to create favourable conditions for safeguarding a more economically viable, more competitive and sustainable development of fishery, fish processing and aquaculture sectors. The Common Fisheries Policy is aimed at ensuring a sufficiently high standard of living in the fisheries, as well as it tends to establish efficient, visible and stable internal market, guaranteeing its participants equal competition conditions. Latvia, just like other EU member states, receives multi-annual aid of financial support from the EU funds and financial instruments for implementation of the Common Fisheries Policy; the support is targeted at the priorities set at the level of the EU and is adapted to the peculiarities of each member state's sector. The purpose of the support provided by the EU funds and financial instruments is to promote competitive, environmentally sustainable, economically viable and socially responsible fisheries. Purposeful provision and distribution of the provided support as well as its effective and rational use is crucial for facilitation of competitiveness in the fisheries sector.

The modern global economy undergoes changes which are primarily related to globalization processes, uneven development of countries as well as strengthening of competition struggle. Competitiveness is set forward as one of the conditions for economic recovery. In the recent years, a view that one of the factors stimulating competitiveness is clusterization has come to the fore. Facilitation of competitiveness has become one of the main goals in development strategies of enterprises, sectors and states. Assessment of competitiveness provides the opportunity to make impartial judgments about the need in structural reforms and choice of priorities in establishment and implementation of the sector policy and to better understand them.

A cluster is a cooperation network of similar and competing or associated companies, research, educational and other related institutions operating in the sector, which is located in a specific geographic territory; in the framework of this network, joint cooperation facilitates the competitiveness and development of enterprises and respectively of the whole sector. Assessment and facilitation of the competitiveness of the fisheries sector cluster is a topical issue among not only scientists, but also the companies operating in the sector and institutions involved in the establishment and implementation of the fisheries policy. There are comparatively few studies about the competitiveness of a sector cluster; in addition, there is almost no research about the competitiveness of the fisheries sector cluster what thereby causes problems in the process of competitiveness evaluation.

Peculiarity of competitiveness lies in the fact that it contains socioeconomic, political, environmental and cultural categories which are interrelated in continuous interaction, thereby making the process of assessment rather difficult. Researchers and scientists interpret competitiveness differently – some of them believe that only companies compete among themselves, not the countries; consequently, business financial indicators such as entrepreneurship strategies, its management skills, marketing, price and cost efficiency lie in the basis of competitiveness. However, business is carried out by a company operating in a certain region according to the legislation in force in the area; thereby many things depend on the measures carried out in the framework the country and the environment created there. The experience of economic development all over the world has proven that there are many various interrelated and mutually impacting factors influencing competitiveness, as a result of what the methodology for evaluation of competitiveness is not unequivocal. Nowadays scientists, policy planners and entrepreneurs believe that the factors influencing competitiveness have to be evaluated in the common context.

Taking into account the ancient history and traditions of Latvian fisheries sector, its development potential and ability to produce competitive products for the global market as well as interaction and interdependence between the sectors of the sector, evaluation and strengthening of competitiveness of the fisheries sector cluster plays an important role. Using the available natural resources and the support opportunities provided by the EU funds and financial instruments as well as participating in establishment of the Common Fisheries Policy, the Latvian fisheries sector is offered broad opportunities for facilitation of competitiveness.

In the Doctoral Thesis, the following research questions are formulated

1. What is the competitiveness of the Latvian fisheries sector like in the framework of the cluster?
2. How to facilitate the competitiveness of the Latvian fisheries sector in the framework of the cluster?
3. How to evaluate the competitiveness of the Latvian fisheries sector in the framework of the cluster?

The research object

Latvian fisheries sector in the framework of the cluster.

The research subject

Competitiveness under the influence of microeconomic factors.

The research aim

To develop methodology for evaluation of the competitiveness of the Latvian fisheries sector in the framework of the cluster providing proposals for further development of the sector.

To reach the aim, the following work tasks were put forward

- 1) to provide a general insight about the Latvian fisheries sector cluster and its activity;
- 2) to explore and analyse the essence and definitions of competitiveness, identifying the factors influencing the competitiveness of sector cluster;
- 3) to explore and analyse the world-famous possibilities and methods for evaluation of competitiveness;
- 4) to develop methodology for evaluation of the competitiveness of fisheries sector cluster;
- 5) to evaluate the competitiveness of the Latvian fisheries sector, identifying the spheres currently ensuring the competitiveness and providing proposals for further development of the sector.

Limitation of the research

- The time allowed for development of the Doctoral Thesis, availability of statistical data and information as well as their quality determined the volume of the Thesis, level of its details and the period chosen for analysis of statistical data from 2005 to 2017.
- Due to specification and financial aspect the Doctoral Thesis deals with analysis of microeconomic factors influencing the competitiveness of the Latvian fisheries sector cluster, not performing in-depth analysis of influence of the macroeconomic factors and comparison to other countries.
- Taking into account that almost all the statistical data describing the fisheries sector are not publicly available and obtaining them is a payable service, the majority of the used raw data were reflected without their actual values in the framework of the Thesis.

Hypothesis

By implementing interrelated and single Latvian fisheries policy the improvement of competitiveness in the sector can be facilitated.

Defined theses

1. The competitiveness of the Latvian fisheries sector cluster is significantly influenced by the availability and quality of fish resources, and formation of mutual cooperation and interaction forms between the companies operating in the sector.
2. Sectors of the Latvian fisheries sector may have different competitiveness levels and spheres ensuring the competitiveness.
3. Sectors of the Latvian fisheries sector can have different strategies to be implemented for facilitation of competitiveness and spheres to be improved as a matter of priority in their framework.

Theoretical and methodological foundation of the Thesis

The insights reflected by researchers, scientists and various institutions in the books, scientific articles, study reports, conference materials, documents of development planning and the Internet resources published in Latvia and abroad from 1759 to 2019. The theoretical and methodological basis of the Thesis consists of the theoretical and practical insights of foreign researchers and scientists M. E. Porter, P. Krugman, O. B. Михайлов, G.D. Bella, M. Lewis, A. Martin, K. Stiefelmeyer, S. Kuznets, M. Durand, C. Giorno, J. Schumpeter, J. Sharples, N. Milham, D. Tirupati, P. D. Reynolds, J. Lukaszewski, W. C. Charles, P. H. Douglas, A. Smith, R. M. Solow, J. Schumpeter, W. W. Rostow, L. L. Pasinetti, Z. J. Ács, A. Varga, A. Marshall, H. Ю. Щетинина, G. Charles, and Latvian researchers and scientists Ž. Garanti, I. Kassalis, K. Fedotova, I. Geipele, V. Boroņenko, J. Caune, F. Kotlers, A. Gļebova, L. Vasiļjeva, A. Dzedons, L. Pētersons, S. Liše, A. Krieviņa, et al. The theoretical and methodological basis includes also the studies of the US Congress, International Monetary Fund, Organization for Economic Co-operation and Development, World Economic Forum, Agri-food Competitiveness Council, United Nations Industrial Development Organization, Centre for International Competitiveness and other institutions.

The informative basis of the research

Scientific and methodological literature, international publications, reports and accounts, legislation elaborated by Latvia and the EU as well as the scientific papers and studies published by the author. In the development of the Thesis the statistical data of CSB, LFICIS, RSS and Eurostat as well as the available information from MA, FVS, Latvian Fisheries Yearbook and Lursoft was used.

Research methods

Development of the Doctoral Thesis includes application of qualitative and quantitative methods, including general scientific methods (logically-constructive (induction and deduction), graphic, monographic or descriptive approach, method of analysis and synthesis), methods of statistical studies (statistical observation and correlation analysis), mathematical methods (mathematical statistics, econometric methods, methods of mathematical logic) and

sociological research methods (content analysis, expert method, interviews and surveys). To process and analyse the results of the research, Microsoft Excel, Microsoft PowerPoint, XLSTAT Premium, ArcGIS and IrfanView program, as well as www.google.com tools for creation of surveys were used.

Scientific novelty

1. Developed and approbated graphic Model of the Factors Influencing Competitiveness of the Fisheries Sector Cluster.
2. Elaborated and approbated methodology for evaluation of competitiveness in the fisheries sector cluster.
3. Elaborated and approbated indicators for evaluation of sales and management efficiency – Sales Efficiency Ratio and Efficiency of Management Abilities Ratio.
4. Developed and approbated strategies for facilitation of competitiveness in the fisheries sector.
5. Established level of competitiveness in the Latvian fisheries sector.
6. Established spheres currently ensuring the competitiveness of the Latvian fisheries sector – spheres facilitating and promising, as well as spheres procrastinating and stagnating the competitiveness.
7. Identified the strategies to be implemented in order to facilitate the competitiveness of the Latvian fisheries sector.

Scientific publications

1. Biukšāne, I. Problems of fishery in Latvian ports and its development perspectives. *Economic Science for Rural Development*. 2014, Issue 34, pp. 22–30 (indexed in Web of Science).
2. Biukšāne, I. The EU financial instruments Support and Return on Investments of fish processing in Latvia. *International Scientific Conference 'Research for Rural Development 2015' Proceedings*. 2015, Vol. 2, pp. 262–268 (indexed in SCOPUS).
3. Biukšāne, I. Production capacity of fish processing in Latvia. *International Scientific Conference 'Research for Rural Development 2015' Proceedings*. 2015, Vol. 2, pp. 269–275 (indexed in SCOPUS).
4. Biukšāne, I. Factors, influencing viability of the projects in the Latvian aquaculture sector. *International Multidisciplinary Scientific Conference on Social Sciences and Arts Conference Proceedings*. 2015, Book II, Vol. 2, pp. 185–192. Doi: 10.5593/SGEMSOCIAL2015/B22/S6.024 (indexed in Web of Science).
5. Biukšāne, I. Commercial role of the round goby (*Neogobius melanostomus* Pallas) in different countries. *Proceedings of the 58th International Scientific Conference of Daugavpils University*. 2016, pp. 7–16 (indexed in EBSCO).
6. Biukšāne, I., Judrupa, I. Evaluation of competitiveness of the Fisheries Sector Cluster. *International Scientific Conference 'Research for Rural Development 2016' Proceedings*. 2016, Vol. 2, pp. 238–245 (indexed in SCOPUS and Web of Science).
7. Biukšāne, I. Cooperation in Latvian fisheries sector. *International Conference 'Economic Science for Rural Development' Proceedings*. 2017, Issue 44, pp. 315–322

- (indexed in Web of Science).
8. Biukšāne, I. Competitiveness of the Blue Economy of Latvia. *International Scientific Conference 'Engineering for Rural Development' Proceedings*. 2017, Vol. 16, pp. 18–25 (indexed in SCOPUS and Web of Science).
 9. Biukšāne, I. Latvian fisheries sector cluster. *International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management*. 2018, Vol. 18 (5.4.), pp. 465–472. Doi: 10.5593/sgem2018/5.4/S23.059 (indexed in SCOPUS).
 10. Biukšāne, I. Availability and quality of production factors in Latvian fisheries sector. *International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management*. 2018, Vol. 18 (5.1.), pp. 105–112. Doi: 10.5593/sgem2018/5.1/S20.014 (indexed in SCOPUS).
 11. Biukšāne, I. Assessment of financial stability of Latvian fisheries sector. *International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management*. 2018, Vol. 18 (5.3.), pp. 87–92. Doi: 10.5593/sgem2018/5.3/S28.011 (indexed in SCOPUS).
 12. Biukšāne, I. Facilitation of competitiveness in Latvian fishery sector. *International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management*. 2018, Vol. 18 (3.2.), pp. 1135–1142. Doi: 10.5593/sgem2018/3.2/S15.144 (indexed in SCOPUS).
 13. Biukšāne, I. Support to the Latvian fishery sector through the EU financial instruments. *Research for Rural Development*. 2018, Vol. 2, pp. 203–209. Doi: 10.22616/rrd.24.2018.073 (indexed in SCOPUS and Web of Science).
 14. Biukšāne, I. Methodology for evaluation of marketing and management efficiency: Key of fisheries sector in Latvia. *International Conference 'Business Information Management Association' Proceedings*. 2019, pp. 1276–1282 (indexed in SCOPUS).
 15. Biukšāne, I. Development of centre of Latvian fisheries sector cluster (submitted for publication and indexation in Web of Science).
 16. Biukšāne, I. Production competitiveness in Latvian fisheries sector (submitted for publication and indexation in Web of Science).
 17. Biukšāne, I. Diversity and competitiveness of products in Latvian fisheries industry (submitted for publication and indexation in SCOPUS).
 18. Biukšāne, I. Consumption of Fish and Sea Products in Latvia (submitted for publication and indexation in Web of Science).
 19. Biukšāne, I. Financial situation of micro and small enterprises in the Latvian aquaculture sector (submitted for publication and indexation in SCOPUS and Web of Science).
 20. Biukšāne, I. Production competitiveness of SMEs Enterprises in the Latvian Fishery Sector (submitted for publication and indexation in SCOPUS and Web of Science).

Reports-studies¹

1. Situācijas analīze akvakultūrā saistībā ar ZRP 2007–2013 ieviešanu (*Analysis of Situation in Aquaculture due to Introduction of OPF 2007–2013*), 2012 (in Latvian).
2. ZVRG stratēģiju un ieviesto projektu ekonomiskās dzīvotspējas analīze (*Analysis of FLAG strategies and Economic Viability of Projects Implemented by them*), 2012 (in Latvian).
3. EZF RP 2007–2013 ieviešana. Situācijas analīze akvakultūrā (*Introduction of EFF OP 2007–2013. Analysis of Situation in Aquaculture*), 2013 (in Latvian).
4. 3. prioritārā virziena pasākumu Nr. 301 ‘Kopīgas rīcības pasākumi’ un Nr. 303 ‘Investīcijas zvejas ostās un zivju izkraušanas vietās’ investīciju atdeve. Latvijas ostas (*Return of Investments of the 3rd Priority Direction Activities No. 301 ‘Joint Action’ and No. 303 ‘Investments into Fishing Ports and Fish Unloading Places’*), 2013 (in Latvian).
5. 2. prioritārā virziena ekonomiskā analīze saistībā ar akvakultūru un potenciālo tirgus izpēti (*Economic Analysis of the 2nd Priority Direction in Relation to Aquaculture and Research of Potential Markets*), 2013 (in Latvian).
6. Ražošanas tehnoloģiju pieejamība zivsaimniecības nozares attīstībai Latvijā (*Availability of Production Technologies for Development of Fisheries Sector in Latvia*), 2014 (in Latvian).
7. Akvakultūras projektu dzīvotspējas analīze (*Viability Analysis of Aquaculture Projects*), 2014 (in Latvian).
8. Zvejniecības attīstība Baltijas jūras un Rīgas jūras līča piekrastes joslā (piekrastes zveja) (*Fishery Development in the Coastal Area of the Baltic Sea and the Gulf of Riga (Coastal Fishing)*), 2014 (in Latvian).
9. Intervences loģika EZF RP 2007–2013 (*Intervention Logic of EFF’s OP 2007–2013*), 2012–2014 (in Latvian).
10. Investīciju iespējas zvejas kuģu ierīcēs (*Investment Opportunities in Fishing Vessel Devices*), 2015 (in Latvian).
11. Apaļā jūras grunduļa izmantošanas iespējas Latvijā (*Round Goby Using Possibilities in Latvia*), 2015 (in Latvian).
12. Latvijas akvakultūrā audzējamo zivju ekonomiskais pamatojums un tirgus iespējas (*Economic Justification for Fish Farmed in Latvian Aquaculture and Market Possibilities*), 2015 (in Latvian).
13. Ražotājorganizāciju darbības izpēte tālākās darbības uzlabošanai (*Research of Producer Organization Activity for Improvement of Further Activity*) (2016) (In Latvian).
14. Zivsaimniecības sadarbības tīkla darbības uzlabojumu iespējas (*Improvement Possibilities of Fisheries Cooperation Network Operation*), 2016 (in Latvian).
15. ZRP ieguldījumi zvejniecībā KZP mērķu sasniegšanai (*OPF Contribution into Fishery*

¹ Reports-studies, developed in the framework of the ongoing evaluation of MA funded projects *Operational Programme for the Implementation of the European Fisheries Fund Support in Latvia for 2007–2013* and *Operational Programme for Fisheries and Sea 2014–2020*.

- to Reach the Goals of CFP*), 2017 (in Latvian).
16. ZRP ieguldījumi tirdzniecības un apstrādes veicināšanā KZP mērķu sasniegšanai (*OPF Contribution into Promotion of Trade and Treatment to Reach the Goals of CFP*), 2018 (in Latvian);
 17. ZRP ieguldījumi teritoriālās attīstības un nodarbinātības palielināšanā KZP mērķu sasniegšanai (*OPF Contribution into Territorial Development and Increase in Employment to Reach the Goals of CFP*), 2018 (in Latvian).
 18. ZRP 2014–2020 novērtēšanas informācija 2019. gada paplašinātajam ikgadējam īstenošanas ziņojumam (*OPFS 2014–2020 Assessment Information to the Extended Annual Implementation Report 2019*), 2019 (in Latvian).
 19. Zilās ekonomikas sektori Latvijā jaunā EJZF 2020–2027 regulējuma tvērumā (*Blue Economy Sectors in Latvia in Scope of the New EMFF Regulation 2020–2027*), 2019 (in Latvian).
 20. Intervences loģika EJZF RP 2014–2020 (*Intervention Logic of EMFF's OP 2014–2020*), 2015–2019 (in Latvian).

Conferences

1. 71st Scientific Conference ‘Geography. Geology. Environmental science.’, Latvia, Riga, 31 January 2013.
2. 15th International Scientific Conference ‘Economic Science for Rural Development 2014’, Latvia, Jelgava, 24–25 April 2014.
3. 21st Annual International Scientific Conference ‘Research for Rural Development 2015’, Latvia, Jelgava, 13–15 May 2015.
4. 56th International Scientific Conference on Economics and Entrepreneurship (SCEE’2015), Latvia, Riga, 14–17 October 2015.
5. 4th International Scientific Conference ‘Contemporary Issues in Business, Management and Education 2015’, Lithuania, Vilnius, 13–13 November 2015.
6. 58th International Scientific Conference of Daugavpils University, Latvia, Daugavpils, 14–15 April 2016.
7. 22st Annual International Scientific Conference ‘Research for Rural Development 2016’, Latvia, Jelgava, 18–20 May 2016.
8. 3rd ‘International Multidisciplinary Scientific Conferences on Social Sciences and Arts 2016’, Bulgaria, Albena, 23–28 August 2016.
9. CBU International Conference ‘Innovations in Science and Education’, Czech Republic, Prague, 22–24 March 2017.
10. 18th International Scientific Conference ‘Economic Science for Rural Development 2017’, Latvia, Jelgava, 27–28 April 2017.
11. 16th International Scientific Conference ‘Engineering for Rural Development’, Latvia, Jelgava, 24–26 May 2017.
12. 11th International Scientific and Practical Conference ‘Environment. Technology. Resources’, Latvia, Rezekne, 15–17 June 2017.
13. 17th International Multidisciplinary Scientific GeoConferences – SGEM’2017, Bulgaria, Albena, 27 June – 6 July 2017.

14. 24th Annual International Scientific Conference ‘Research for Rural Development 2018’, Latvia, Jelgava, 16–18 May, 2018.
15. 32nd International Business Information Management Association Conference (IBIMA conference), Spain, Seville, 15–16 November 2018.

Seminars, experience exchange trips, etc.

1. Seminar ‘Competitiveness of the Latvian Fisheries Sector Cluster’ (08.06.2018, Latvia).
2. Experience and exchange trip ‘Aquaculture in Estonia’ (14–16.11.2017, Estonia).
3. Experience and exchange trip ‘Carp Breeding Experience in Hungary’ (24–29.09.2016, Hungary).
4. Experience and exchange trip ‘Development of Territory and Fisheries in the Coastal Area of the Baltic Sea’ (22–26.11.2015, Poland).
5. Experience and exchange trip ‘Development and Technologies of Sturgeon and Trout Breeding Aquaculture Farms in Poland’ (11–15.08.2015, Poland).
6. Supervisory Committee meetings and seminars organized by the Ministry of Agriculture.
7. Participation in the improvement process of Cabinet Regulation and support conditions and selection criteria for OPFS 2014–2020;
8. Teaching the subject ‘Developments of Economic Policy of the European Union’ at Riga Technical University during the academic year 2013/2014.

Structure and volume of the Thesis

The structure of the Doctoral Thesis is organized in the light of the research aim and tasks put forward. The Thesis consists of Introduction, 3 chapters, Conclusions and Proposals. Its volume is 164 pages, excluding appendices. The work includes 27 figures, 23 tables and 20 appendices explaining and illustrating the content of the research. The bibliography list includes 189 literature sources.

Chapter 1 of the Doctoral Thesis provides a general insight into the activity of the fisheries sector cluster in Latvia, reflects competitiveness of economic agents and its influencing factors as well as offers and appropates a conceptual framework for disclosure of the theoretical aspects of competitiveness.

Chapter 2 deals with analysis of the world-famous studies, elaboration and approbation of methodology for evaluation and facilitation of competitiveness of the fisheries sector cluster.

Chapter 3 presents the performed evaluation of competitiveness of the Latvian fisheries sector, determining the level of competitiveness in the sector and identifying the spheres currently ensuring the competitiveness and strategies to be implemented in future. It includes reasoned proposals for improvement of the Latvian fisheries sector policy, in order to facilitate the competitiveness of the sector and its growth.

Logics of the research

The logical structure of the research (see Fig. 0.1 on the following page) is determined by the aim of the research and the logical sequence of research objects.

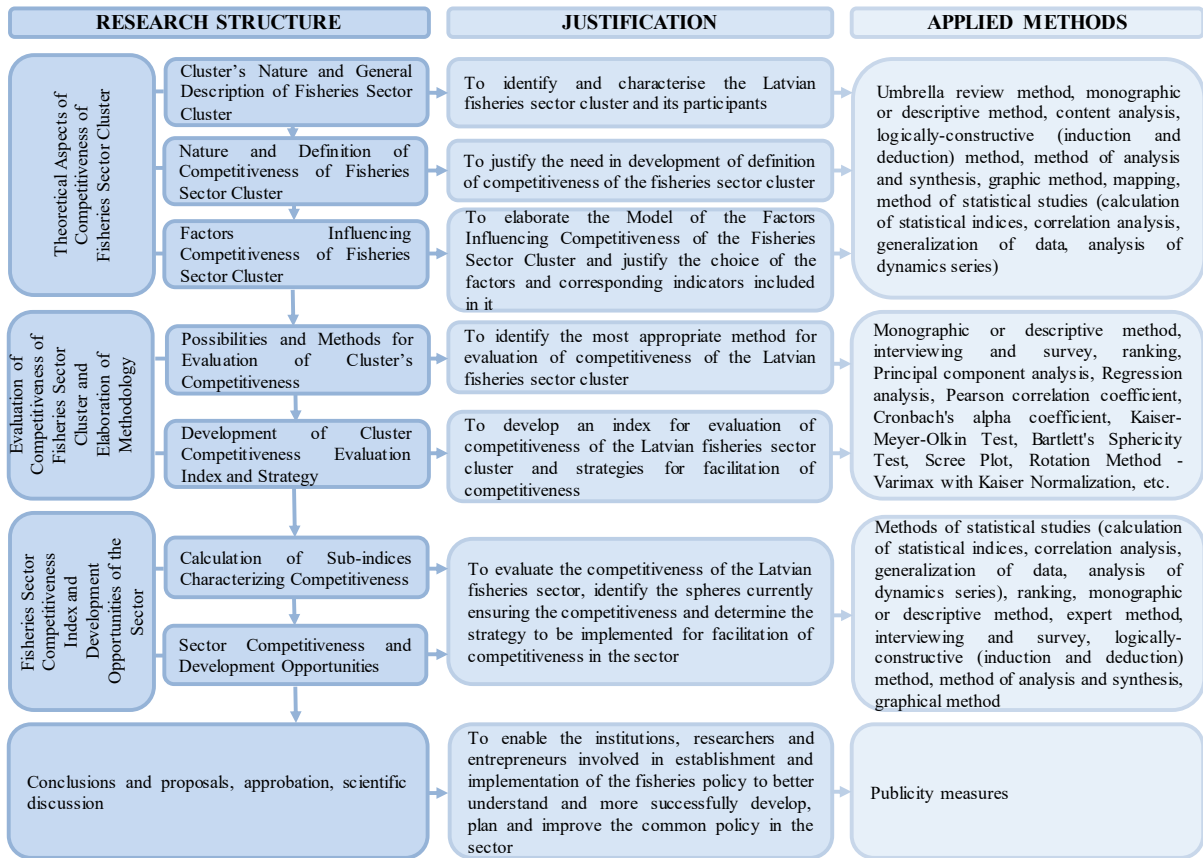


Fig. 0.1. Logic of the research (created by the author).

It consists of research structure and its justification, and the applied methods.

1. THEORETICAL ASPECTS OF COMPETITIVENESS OF FISHERIES SECTOR CLUSTER

1.1. Cluster's Nature and General Description of Fisheries Sector Cluster

Since the research object of the Thesis is the Latvian fisheries sector in the framework of cluster, this chapter will deal with study of what is a cluster and will describe the fisheries sector cluster in Latvia. To describe the cluster, the general scientific research methods, methods of statistical study, mathematical methods, sociological research methods as well as other conceptually suitable methods were used.

A cluster is a cooperation network of merchants, research, educational and other related institutions, which operates in a certain sector of national economy or interrelated sectors, uses related technologies and labour resources of similar profile, consists of legally independent merchants who compete and simultaneously implement cooperation with each other (Reģionālās attīstības un pašvaldību lietu ministrija, 2010, 98). It is a cooperation network of similar and competing or associated companies and institutions operating in the sector, which is located in a certain geographic territory (see Fig. 1.1). In the framework of this network, joint cooperation facilitates the competitiveness and development of enterprises and respectively of the whole sector.

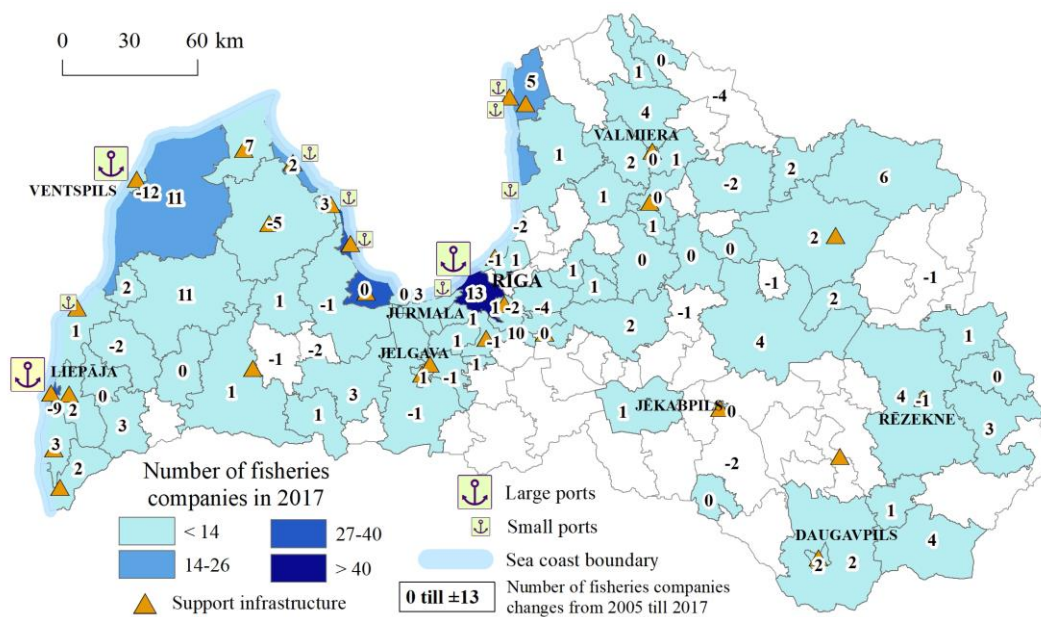


Fig. 1.1. Spatial location of Latvian fisheries companies and support infrastructures in 2005–2017 (created by the author).

Note. The figure does not include cooperation companies and their spatial location due to constraints of data availability and quality.

Cluster's main goal is to increase the competitiveness of the companies in the cluster on the local and global scale. Its main features are geographical concentration, mutual cooperation and common interests. Clusters are significant for the development of state and regional national economy, and their importance is stressed not only at the local, but also the international level. Due to the advantages created by the cluster's environment there emerge innovations, efficiency raises and geographical concentration increases (Kassalis, 2010c, 14). The main benefits of the cluster members are resource consolidation and their mutual supplementation, continuous networking, knowledge transfer and cooperation, development of support infrastructure and related companies, improvement of productivity, strong lobbying of interests at the government level and higher stability in changeable markets (Kassalis, 2010a, 637). Cluster environment promotes emergence of healthy mutual competition and increase in general competitiveness of the companies. The related companies and sectors included in the support infrastructure depend on evolution of the companies in the sector – development of the companies operating in the sector benefits both the related companies and also sectors included in the support infrastructure. Cluster environment stimulates not only the competitiveness of the companies, but also the competitiveness of the region and increases economic growth of the state (Porter, 1990, 855; Kassalis, 2010c, 15; Boroņenko, Zeibote, 2011, 36). Cluster environment shows integrated long-term development at a horizontal and vertical level (Kassalis, 2010b, 20), and cyclicality of competitiveness.

Along with theoretical and empirical studies pointing at a range of various advantages created by cluster environment, also the state authorities draw attention to the need in clusters. The long-term strategy 'Latvia 2030. Sustainable Development Strategy of Latvia until 2030' of the Saeima of the Republic of Latvia emphasizes the need in regional clusters for stimulation of innovation, regional specialization and identity. The strategic framework of cluster development in Latvia is defined in the national, sectoral and local planning documents. In Latvia similarly to other EU states, laws and regulations do not define clusters as separate legal organization or arrangement.

So far, fisheries sector cluster in Latvia was identified in the research 'Regional cluster establishment and development possibilities in Latvia' carried out in 2015 by Ž. Garanti, the researcher from the Cyprus International University. On the grounds of the international experience concerning identification of clusters, Ž. Garanti elaborated and approbated cluster identification methodology, and in the view of the geographical concentration of the cluster it was called 'coastal region's fish processing and preserving cluster' with high development potential, but low initiative to establish a formal cluster (Garanti, 2015, 60). As the cluster has already been identified, there is no need to identify it again in the Thesis. However, Ž. Garanti did not name in her research all the support infrastructures encompassed by the sector cluster environment, consequently there is a need in repeated identification of the members of the sector cluster.

The environment of the Latvian fisheries sector cluster consists of the fisheries sector (companies operating in the fishery, aquaculture and fish processing) which is at the centre of this cluster and various support infrastructure industries (institutions involved in establishment and implementation of the policy, scientific, educational and research

institutions, ports, producer organizations, local action groups for fisheries, international and non-governmental organizations, etc.) as well as affiliated companies (suppliers of raw materials, service providers, manufacturers of technological equipment, etc.) who are interested in and aimed at facilitation of competitiveness and development in the fisheries sector (see Fig. 1.2). In turn, outside the cluster environment there are other support infrastructures who are not directly focused on promotion of fisheries sector potential, but do impact it (fiscal and monetary policy makers, transport infrastructure and its accessibility providers, planner of demographic and social environment, etc.).

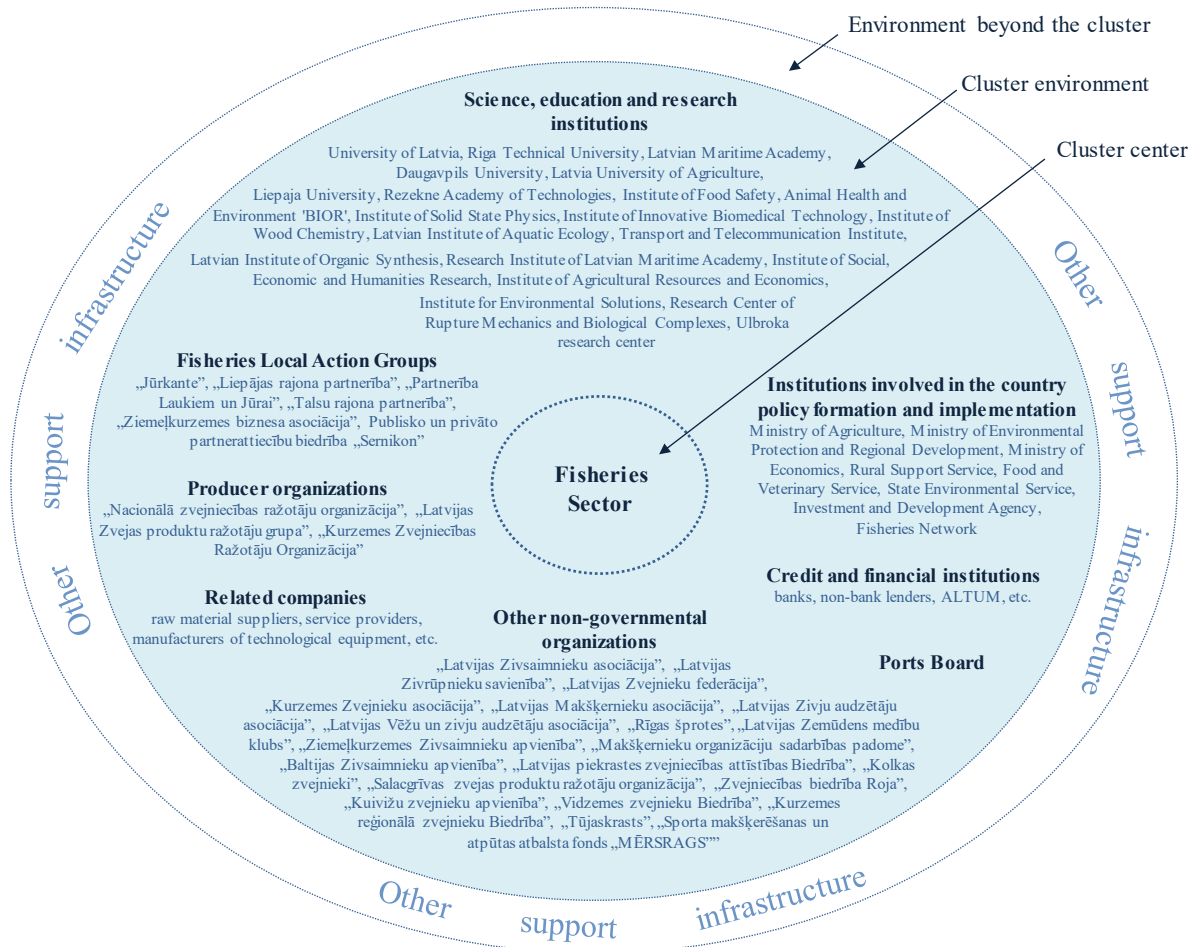


Fig. 1.2. Members of Latvian fisheries sector cluster (created by the author).

Strengthening the competitiveness of the fisheries sector cluster is an especially topical question at the EU level. The European Cluster Memorandum developed by the European Competition Policy Council establishes that clusters are one of the key priorities in strengthening and development of innovations in Europe (Europe Cluster Observatory, 2007, 1; 2009, 14). The European Commission believes that in order to facilitate the development of the sector and to improve its mutual cooperation and coordination, it is important to facilitate competitiveness of the fisheries sector cluster (European Commission, 2008, 25).

The competitiveness of the fisheries sector cluster depends on the competitiveness of the companies operating in the sector and the environment in which they work and which is

created by the state support infrastructures. Strengthening the competitiveness of the fisheries sector cluster can promote not only achievement of the goals of the EU Common Fisheries Policy and ensuring the proper policy management in the sector, but also the growth of the state's economy in general, and especially development of the areas important for fisheries.

The next chapter of the Thesis views the nature of competitiveness and its definitions.

1.2. Nature and Definition of Competitiveness of Fisheries Sector Cluster

According to the subject of the Thesis, namely the competitiveness under the influence of macroeconomic factors, the chapter deals with analysis of theoretical aspects of cluster's competitiveness. To carry out the research umbrella, review method and content analysis were used. Umbrella review method gives the possibility to systematically view and summarize insights from different sources of scientific literature, at the same time providing a broad notion about the consistency of the theme to be examined. The method allows evaluating whether the researchers and scientists who study similar themes always follow analogous regularities and arrive at similar conclusions. The method is used to include all types of systematic conclusions of research. In turn, content analysis, which is focused on the content and systematization of material to be examined, was used to classify the aspects related to competitiveness.

Cluster environment consists of different economic agents; consequently, when analysing competitiveness, one has to take into account the interrelation and interaction of all these economic agents and processes. The research about competitiveness and competitiveness conceptions have been developed and its nature has been reflected by several researchers and scientists, such as M. E. Porter, P. Krugman, O. B. Михайлов, G. D. Bella, M. Lewis, A. Martin, K. Stiefelmeyer, S. Kuznets, M. Durand, C. Giorno, J. Schumpeter, J. Sharples, N. Milham, F. Lipmans, H. Ю. Щетинина, A. H. Асаул, M. П. Войнаренко, П. Ю. Ерофеев, P. Bhawsar, U. Chattopadhyay, et al. In addition, there are many organizations and institutions who have turned to studying competitiveness, for instance, US Congress, International Monetary Fund, Organization for Economic Co-operation and Development, World Economic Forum, Agri-food Competitiveness Council, United Nations Industrial Development Organization, Centre for International Competitiveness, et al. In Latvia, J. Caune, I. Kassalis, K. Fedotova, I. Geipele, Terminology Commission of the Latvian Academy of Sciences and others can be mentioned as important authors of studies about competitiveness.

The concept 'competitiveness' is derived from the concept 'competition', which from the Latin word 'concurrentia' means 'collision', 'rivalry' (Михайлов, 1999, 592). A. Smith described the competitiveness theory by formulating the concept of competitiveness as rivalry where operates a competitiveness principle – 'the principle of invisible hand' (Smith, 1776, 754). If we take competition as an emulative action of economic agents, then competitiveness is 'subject's qualities giving it a possibility to perform the actions, which allow it succeeding in this rivalry' (Михайлов, 1999, 592).

Product competitiveness

In case of cluster, it would be important to view product competitiveness since company competitiveness depends on it. The more competitive a product is, the more competitive companies are.

Company competitiveness

Cluster's competitiveness directly depends on the competitiveness of the companies operating in the sector, therefore analysing the nature and definitions of competitiveness it is significant to view also the competitiveness of companies. Company competitiveness in works of researchers and institutions is defined as competition, value-forming process, key to welfare, production ability and management proficiency facilitating growth and contributing to overall development.

Sector competitiveness

The sector competitiveness is determined by the competitiveness of the companies operating in it, which directly affects the operation of the cluster and its further development. According to researchers and institutions, competitiveness is assessed as ensuring productivity, production capacity and improvement of the standard of living for the companies operating in the sector, maintaining their long-term profitability and market share, increasing their export rate and added value.

State competitiveness

Since the overall growth and wellbeing of the state affects cluster competitiveness, the nature of competitiveness also needs to be viewed from the aspect of the state competitiveness. State competitiveness is viewed in the works of researchers and institutions as an entirety of economic management for the management of resources and competencies, an increase of long-term productivity, and the ability not only to produce and offer, but also to sell their products in the markets, at the same time ensuring and maintaining growing standards of living. The level of state development and wellbeing determines the conditions for business activity, which in turn influences the competitiveness of cluster. State development plays a significant role in facilitating cluster competitiveness.

Cluster competitiveness

Cluster competitiveness affects overall growth and wellbeing of the state, which in turn determines the conditions for the activity and competitiveness of the companies operating in the sector. When analysing the nature of competitiveness, it is important to also review cluster competitiveness. The majority of researchers have reviewed cluster competitiveness without going into details of the interrelation and interaction of all the agents and processes forming the cluster environment. In the studies, cluster competitiveness is viewed through separate economic agents, thus creating a different view of the nature of competitiveness. In the conclusions of the researchers, cluster competitiveness is viewed differently. The majority of researchers view cluster competitiveness from the aspect of the competitiveness of the companies operating in it, defining it as the ability to produce and distribute products in accordance with the advantages created by the macroeconomic environment. In turn, other

researchers believe that cluster competitiveness needs to be assessed broader – it needs to be viewed not only from the aspect of companies, but simultaneously and in relation to the state competitiveness. In this case researchers see cluster competitiveness as the ability of companies and state institutions to effectively cooperate and compete with other clusters.

Definitions of competitiveness applicable to several economic agents

There are studies viewing competitiveness through several economic agents at the same time. In the review of literature analysis, competitiveness is not divided according to separate economic agents, on the contrary – it is combined. The analysed conclusions of the researchers suggest that competitiveness of companies, the sector and the state manifests as the ability to sell their offer while simultaneously entering markets and preserving them in the long term. Competitiveness is defined as the result of cooperation of these economic agents impacting the long-term development of the state.

Summary on competitiveness

The term competitiveness is often used in economic policy debates where the associated meanings of this term are often different and in many cases are not defined clearly enough. The notion and theoretical foundation of competitiveness have been historically developing for a long time, which has allowed defining different aspects of the notion of competitiveness.

The author concludes that competitiveness is a multi-level notion as the economic agents of all kinds compete with each other. When analysing competitiveness, the interrelation and interaction of these economic agents and processes have to be considered (see Fig. 1.3).

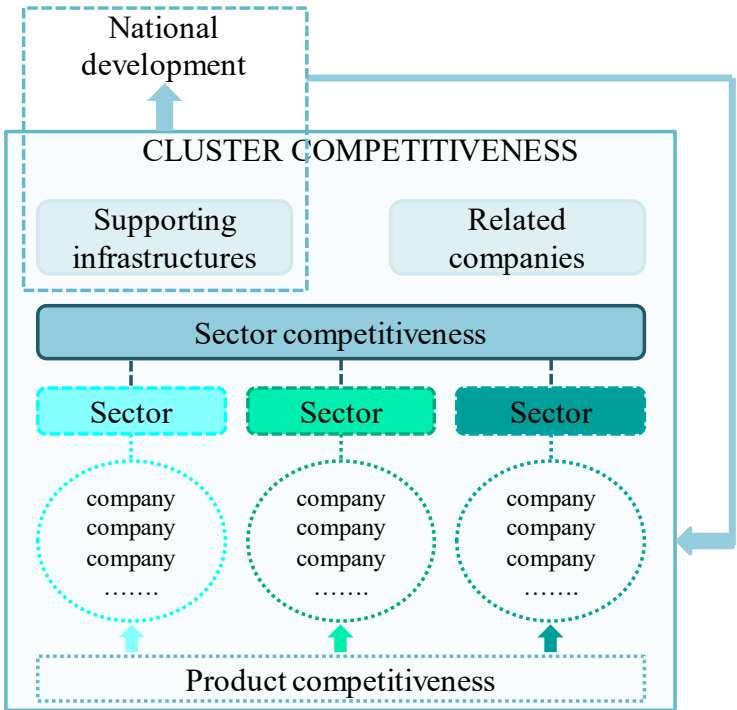


Fig. 1.3. Competitiveness evaluation levels (created by the author).

Product competitiveness affects the competitiveness of companies operating in a particular sector of national economy. Cluster competitiveness directly depends on the competitiveness of the companies operating in the sector. Cluster competitiveness affects overall development and wellbeing of the state. The development and wellbeing of the state will determine the conditions for the operation and competitiveness of the companies operating in the sector, which will in turn affect cluster competitiveness. Thus, the competitiveness of the fisheries sector cluster needs to be viewed not only from the aspect of the product, company and sector competitiveness, but also from the aspect of the state competitiveness.

The author concludes that competitiveness is a multi-dimensional research topic characterised by both different and common features. Despite the contribution of many researchers and scientists to the study of the nature of competitiveness, the author concludes that there is still no single and unambiguous definition of cluster competitiveness. The majority of researchers and scientists view competitiveness as an entirety of economic management for the management of resources and competencies with the aim to maintain growing standards of living in the long term. However, there are also researchers and scientists who understand competitiveness as the ability to produce and sell goods and services, and as the formation of different values and benefits. Competitiveness is also seen as the ability to compete successfully. Even though the conceptions of competitiveness developed and proposed so far have differed, they are not to be evaluated as incorrect. The conceptions of competitiveness were different because the researchers and scientists viewed competitiveness from different aspects, reflecting the most important features related to it. It is not important how many researchers and scientists are inclined to one or another concept of competitiveness. It is significant to understand whether the concepts reviewed are suitable for evaluation of the competitiveness of the fisheries sector cluster. The author understands and agrees with the concepts of competitiveness developed and proposed to date; however, they cannot be fully applied to the fisheries sector cluster. The author believes that the concepts of competitiveness proposed are unable to fully reflect all the aspects related to competitiveness of the fisheries sector cluster.

Competitiveness and development potential of the fisheries sector cluster directly depend on the aspect of the natural environment, where the quality and functionality of the ecosystem play a significant role. Global warming resulting from human activity poses a significant threat to the full functioning of the ecosystem, which in turn affects fish population and its natural renewal. To preserve the availability of fish resources for the future generations, the EU strictly regulates the preservation, management and use of fish resources, which is one of the main aims of the Common Fisheries Policy. The EU Common Fisheries Policy strives to ensure that activity of fisheries is ecologically sustainable in the long term, which is a prerequisite for socioeconomic development. Thus, in the framework of the Common Fisheries Policy, competitiveness is viewed not only from the socioeconomic aspect, but also from the aspect of natural and cultural heritage in connection with the essence of viability and sustainability, which is not reflected in the concepts of competitiveness developed and proposed by scientists and researchers.

The author believes that the sector cluster cannot be competitive without implementation of viable and sustainable aims in the aspect of the natural and cultural environment, as well as the socioeconomic, and political aspect. Considering this evaluation, the author suggests her own explanation of the notion of competitiveness. The author believes that competitiveness of the fisheries sector cluster is the ability to compete locally and internationally, where viable and sustainable goals in the aspect of the natural and cultural environment, as well as in the socioeconomic, and political aspect, are jointly implemented through effective cooperation and interaction among companies and institutions.

Competitiveness is the key element to success of a sector cluster. Therefore, in order to increase the competitiveness and facilitate the development, companies operating in the sector have to create and maintain a competitive advantage distinguishing them from the other companies (Caune et al., 2003, 19; Fedotova, Geipele, 2009, 79). Facilitation of competitiveness has become one of the key goals when implementing development strategies (Škapars, Šumilo, 2006, 9); consequently, a lot depends on the measures carried out on the national scale and the environment created by the state (Paula, Titarenko, 2009, 15).

The next chapter of the Doctoral Thesis will identify factors influencing the competitiveness of the Latvian fisheries sector cluster.

1.3. Factors Influencing Competitiveness of Fisheries Sector Cluster

In order to elaborate methodology for assessment of competitiveness of the Latvian fisheries sector in the framework of a cluster and to provide proposals for further development of the sector it is important to identify the factors influencing the competitiveness of the cluster. The general scientific research methods and methods of sociological study (including content analysis) were applied to explore and describe study of the factors influencing the competitiveness of the fisheries sector cluster.

There is almost no research about factors influencing the competitiveness of the fisheries sector cluster, what thereby causes issues in the process of competitiveness evaluation. In order to identify the factors influencing the competitiveness of the fisheries sector cluster, the author will view the theoretical and practical conclusions of several researchers and scientists. Since cluster environment includes several economic agents, then factors influencing the competitiveness have to be considered viewing all these economic agents. Factors influencing the competitiveness were viewed in the works of many researchers and scientists; among the most relevant to be mentioned are C. Prahalad, G. Hamel, J. Barney, D. Tirupati, P. D. Reynolds, J. Doorley, H. F. Garcia, H. Mintzberg, B. Q. James, M. E. Porter, J. Lukaszewski, Georg Day, R. Wensley, W. C. Charles, P. H. Douglas, A. Smith, R. M. Solow, J. Schumpeter, W. W. Rostow, L. L. Pasinetti, Z. J. Ács, A. Varga, A. Marshall, H. Ю. Щетинина, G. Charles and others. In the Latvian scientific environment, there are also several researchers and scientists who turned to studies on factors influencing the competitiveness, for instance K. Fedotova, I. Geipele, F. Kotlers, A. Gļebova, L. Vasiļeva, J. Caune, A. Dzedons, L. Pētersons, S. Liše, A. Krieviņa, V. Boroņenko, Z. Zeibote, I. Kassalis, et al.

The author believes that the purpose of competitiveness evaluation has not changed appreciably over time. On the grounds of the opinions of several researchers and scientists, as well as different organizations and institutions, the author concludes that competitiveness and its formation is influenced by a range of various factors. Division of the factors influencing the competitiveness depends on the economic subject to be researched and the interrelation and interaction of its processes with the other economic agents.

In the works analysed, the factors influencing the competitiveness were not attributed to all the economic agents, with the exception of just a few factors. Efficiency of operation, innovations, competition, product competitiveness, production resources, and the entrepreneurial environment were determined as the factors influencing competitiveness for all economic agents. However, such factors influencing competitiveness as, for example, different strategy (attributed to the company and sector only), business mobility (attributed to the cluster only), production competitiveness (attributed to the sector only), image and reputation (attributed to the company only), and other factors were attributed to specific economic agents, even though essentially these influence the competitiveness of all economic agents. For example, production competitiveness affects the growth and development not only of the sector, but also of the companies operating in the sector. Cluster competitiveness directly depends on the production competitiveness of the companies operating in the sector. Whereas cluster production competitiveness influences the state development and wellbeing, which influences the conditions for the formation of the entrepreneurial environment where the companies and the cluster of the sector are operating. It can be overall concluded that, in the works reviewed, the factors influencing competitiveness were not attributed to all economic agents; moreover, not all factors influencing competitiveness were identified for each particular economic subject, which can largely be explained by the difference in the interests and views of the researchers and scientists, as well as various organisations and institutions, regarding competitiveness. The conclusions are provided on the basis of the study of a specific economic agent and the particular factors influencing its competitiveness, without going into detail about other aspects related to competitiveness. The author believes that competitiveness of economic agents is affected by all the factors named. The difference is how (directly or indirectly) and to what extent the particular factors influence the competitiveness of the economic agent in question.

Taking into account that different interrelated economic agents operate in the cluster environment, the factors influencing competitiveness should be assessed in the common context. On the basis of the theoretical and practical conclusions expressed by researchers and scientists, different organisations and institutions, the author has developed a graphical Model of the Factors Influencing Competitiveness of the Fisheries Sector Cluster (see Fig. 1.4 on the following page) where the factors influencing the competitiveness of the sector cluster are depicted. Approbation of the model elaborated has been recognised as sufficient in discussions with researchers and sector experts, as well as in public debates at international scientific conferences.

Competitiveness of the fisheries sector cluster is affected by several micro- and macro-economic factors, i.e. socioeconomic, political, natural and cultural environment factors

(including accidental events) and the ability to adapt to them, as well as the formation of mutual interaction and collaboration relations and forms between the companies operating in the sector, related companies, and support infrastructures. The development potential of the cluster is significantly influenced by the quality and functionality of the sea and other aquatic ecosystems, which determines the natural renewal of the fish population, which is important in order to preserve fish resources for future generations.

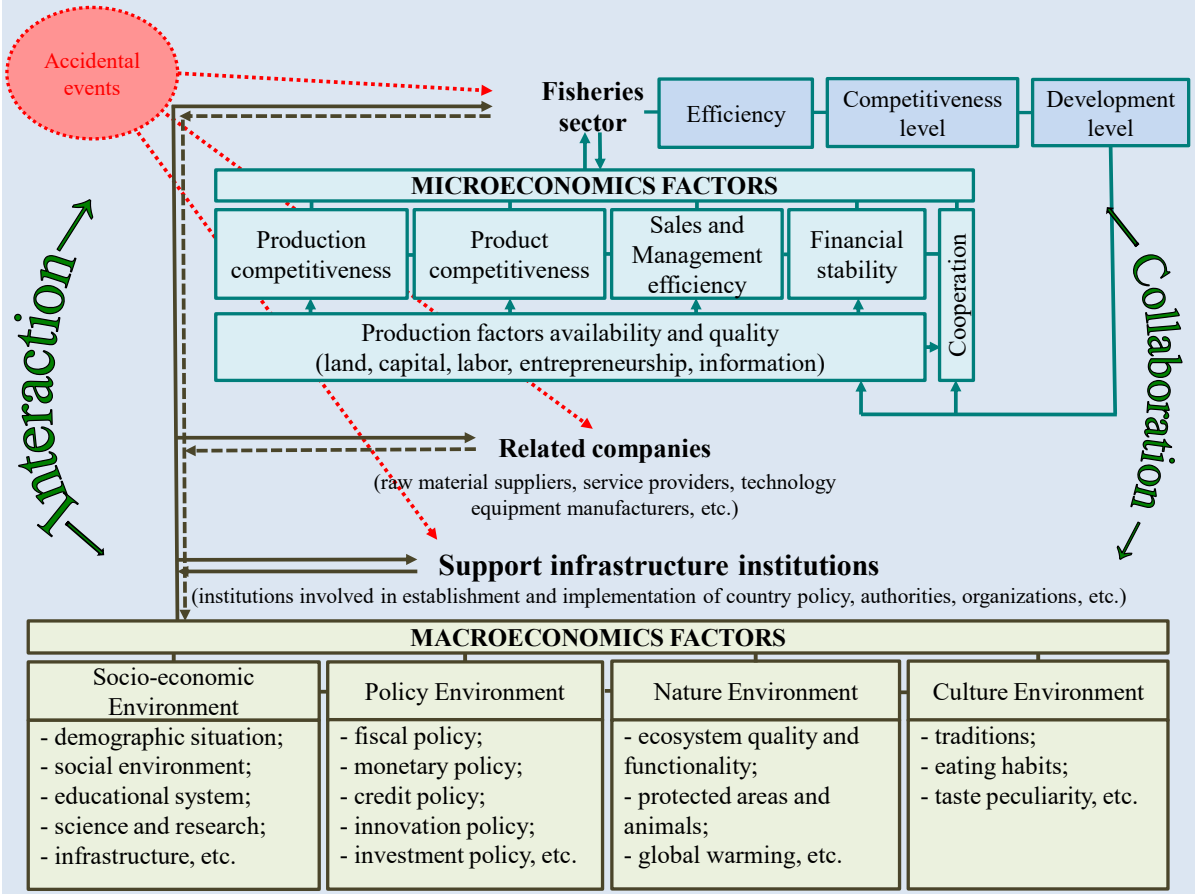


Fig. 1.4. Graphical Model of the Factors Influencing Competitiveness of the Fisheries Sector Cluster (created by the author).

Note. —————> direct influence; - - - - -> indirect influence;> direct and indirect influence.

According to Cabinet Regulation No. 193 (valid from 08.04.2016.), innovations in the fisheries sector are defined as a process where new or remarkably improved products, equipment, processes and methods are developed for introduction, or their functional features and predictable type of application are remarkably improved, as well as researched technical and economical implementation possibilities of the innovative products or processes (Ministru kabinets, 2016a, 2. pants). Innovations is a process influencing the microeconomic factors, therefore they were not identified as a separate factor.

Microeconomic factors reflect the internal processes of the fisheries sector, which it can influence and control, but macroeconomic factors reflect the environment and its quality in which the fisheries sector is operating and which it is unable to change significantly.

The fisheries sector cluster is competitive in the long term if the companies and support infrastructures in its environment are able to cooperate and interact efficiently, together implementing viable and sustainable aims in the improvement of the micro and macro environment. In this case the competitive advantage of the sector cluster manifests as efficiency and its growth.

Competitive advantage enables the participants of the sector cluster to stand out among the competitors, thus allowing to be leaders. Competitive advantage needs not only to be maintained, but also reviewed, analysed and improved on a regular basis, so that the competitors do not find new opportunities for growth within the competitive environment. The participants of the sector cluster need to be dynamic, always in the process of exploration and development. Cluster competitiveness depends on the competitiveness of the companies operating in the sector and on the environment where the sector operates and which is created by the state support infrastructures. The ability of the state to create entrepreneurial environment and its quality will determine the competitiveness of the sector cluster and its contribution to the formation of the wellbeing in the state. Development of the state requires its representing support infrastructures to provide aid in formation of strong and competitive clusters.

The next chapter of the Doctoral Thesis will present the possibilities and methods for evaluation of competitiveness.

2. EVALUATION OF COMPETITIVENESS OF FISHERIES SECTOR CLUSTER AND ELABORATION OF METHODOLOGY

2.1. Possibilities and Methods for Evaluation of Cluster's Competitiveness

Although scientific literature offers many different evaluation methods, in the Doctoral Thesis, the author reviewed and analysed the most frequently used evaluation methods. Competitiveness is a multilevel concept as there is a wide variety of economic agents competing among themselves and competitiveness of a cluster needs to be explored at several levels, therefore the interrelationship and interaction of these economic agents and processes must be taken into account when analysing competitiveness. The author analysed methods that reflect not only the role of product, company, sector and cluster in the formation of national growth, but also methods that show the role of the state and its impact on the competitiveness of other economic agents. An overview of the methods is necessary to evaluate their suitability for evaluation of the competitiveness of the Latvian fisheries sector within the cluster.

Models and matrices for evaluation of competitiveness of product, company and sector

One of the ways to measure and analyse competitiveness and its influence is to use different models and matrices intended for it. Their application enables to use a variety of quantitative research methods in the methodology resulting in easily understandable and interpretable results that can be further used in the development of a relevant strategy.

The author reviewed and analysed several models and matrices well-known throughout world, for example, M. E. Porter's Five Forces Analysis Model, BCG matrix or growth-share matrix, General Electric/McKinsey matrix, Grand Strategy Matrix, 7S model and SWOT analysis model.

The viewed models and matrices provide an opportunity to evaluate the competitiveness of the Latvian fisheries sector cluster, but not fully and not on all the factors affecting competitiveness. In order to make a comprehensive and efficient assessment, other evaluation methods have to be considered, and one of them is the use of different indices.

Indices for evaluation of cluster and state competitiveness

Various indices can also be used to evaluate and analyse competitiveness, which, due to their opportunity to analyse processes and their regularities in time and space, is currently one of the most popular evaluation methods worldwide. In development of index methodology both quantitative and qualitative research methods can be used, thus allowing acquisition of transparent information on all areas related to competitiveness. The use of indices leads to easily understandable and interpretable results, which can be used to evaluate interrelationships and mutual impacts, while simultaneously evaluating changes over time and forecasting future positions. The indices can be used to develop an appropriate strategy.

The research and analysis included Global Gender Gap Index (GCI), Business Competitiveness Index (BCI), Global Competitiveness Index (GloCI), Travel and Tourism Competitiveness Index (TTCI), Economic Freedom Index (EFI), Doing Business Index (DBI), Competitiveness Index (CI), World Knowledge Competitiveness Index (WKCI), European Competitiveness Index (ECI), methodology for evaluation of technology cluster competitiveness ('Методика определения конкурентоспособности технологических кластеров'), Fisheries Competitiveness Index (FCI), Fishery and Aquaculture Competence Index (FACI), Fish Stock Sustainability Index (FSSI), and other indexes.

The viewed indices differ in their purpose of evaluation because their methodology involves estimating various microeconomic and macroeconomic factors. None of the indices fully reflects all aspects related to the competitiveness of the fisheries cluster. The existing indices need to be adapted and combined, or new evaluation solutions have to be found to make an appropriate assessment.

Financial analysis for evaluation of competitiveness of companies and sectors

Nowadays financial analysis is a widespread and popular evaluation method. It is carried out on the basis of data from financial statements (balance, profit and loss account, cash-flow statement), which are prepared pursuant to the national legislative acts and accounting standards. Financial analysis is used not only to forecast bankruptcy of enterprises and sectors, but also to assess their financial situation and competitiveness. Formulas for calculating financial indicators have been the same over a very long period and are still used today as an important tool of financial analysis in the valuation process.

Financial analysis is based on horizontal analysis (comparison with previous reporting periods), vertical analysis (analysis of financial indicators' structure), analysis of various coefficients (determination of indicators' interdependence), trend analysis (determination of indicators' dynamics) and comparative analysis (intercomparison of several economic agents).

Financial analysis provides a sufficiently broad and detailed insight into the evaluation and reflection of various aspects related to competitiveness. It can evaluate not only financial stability (liquidity, solvency, activity, profitability), but also production competitiveness and the effectiveness of marketing and management. It provides an opportunity to improve the efficiency of financial resource management and risk management, as well as allows identifying and forecasting future prospects. Financial analysis can also be used to develop strategies.

Other methods for evaluation of competitiveness of companies, sectors, states and clusters

In addition to different models, matrices, indices and financial indicators, also other less significant evaluation methods such as logical framework, ranking and correlation can be used to assess and analyse competitiveness.

The reviewed methods do not provide an opportunity to fully assess the competitiveness of the fisheries sector cluster, but only causalities and regularities of factors influencing competitiveness as well as the development of progress and regression, which are no less important in the evaluation process. The methods can be used as additional assessment tools

in the analysis of competitiveness evaluation. The reviewed methods can be used alone or in combination, thus ensuring a comprehensive and lucid competitiveness assessment report.

Summary of methods for competitiveness evaluation

Evaluation of information collected and analysed enables the conclusion that if the goal is to evaluate competitiveness and develop an appropriate strategy to promote it, then it is best to use different models and matrices such as M. E. Porter's Five Forces Analysis Model, BCG matrix or growth-share matrix, General Electric/McKincey matrix. To identify the influencing factors, it is possible to use SWOT analysis model and 7S model, etc. Conversely, it is best to use different indices to evaluate changes in competitiveness over time. If the goal is to evaluate the place of the competitiveness level in certain groups of factors, then the method of mathematical statistics – ranking – can be applied. The Pearson correlation coefficient can be used to assess the strength and direction of interactions between factors influencing competitiveness. However, if it is necessary to evaluate the contribution of the various measures taken to achieve the goals pursued, the logical framework method – in this case the intervention logic – can be applied.

Evaluation of the factors influencing competitiveness is a complicated process determined by the choice of a particular method and development of a suitable methodology as well as its application from the perspective of data availability and quality. Due to the variety of evaluation methods, there is no uniform and definite approach to evaluation and measurement of the factors influencing competitiveness. The author concludes that each evaluation method has its own advantages, where its choice depends on the aim pursued.

Although there are different opportunities and methods of assessing competitiveness, there is still no uniform understanding of the requirements for assessing competitiveness. The summarized and assessed evaluation methods and the indicators used in them cover specific areas of activity that are not directly related to the competitiveness of the fisheries sector cluster or cover the areas, which do not fully reflect the competitiveness of the cluster. Consequently, the competitiveness of the fisheries sector cluster can best be evaluated and analysed by developing an appropriate methodology – the Fisheries Sector Cluster Competitiveness Index and the strategies to be implemented to facilitate competitiveness. The methodology will be developed using both quantitative and qualitative research methods. Chapter 2.2 reflects the course and process of the methodology development.

2.2. Development of Cluster Competitiveness Evaluation Index and Strategy

In order to evaluate the competitiveness of the Latvian fisheries sector cluster the fisheries sector cluster Competitiveness Index was developed (see Fig. 2.1 on the following page) that reflects the factors influencing competitiveness of fisheries sector cluster at the level of microeconomics and macroeconomics. The index has been developed as a composite indicator compiled from the Fisheries Sector Competitiveness Index and Fisheries Sector Environment Competitiveness Index. Due to limitations of the Doctoral Thesis, the

methodology for evaluation of fisheries sector competitiveness will be elaborated by calculating the fisheries sector Competitiveness Index.

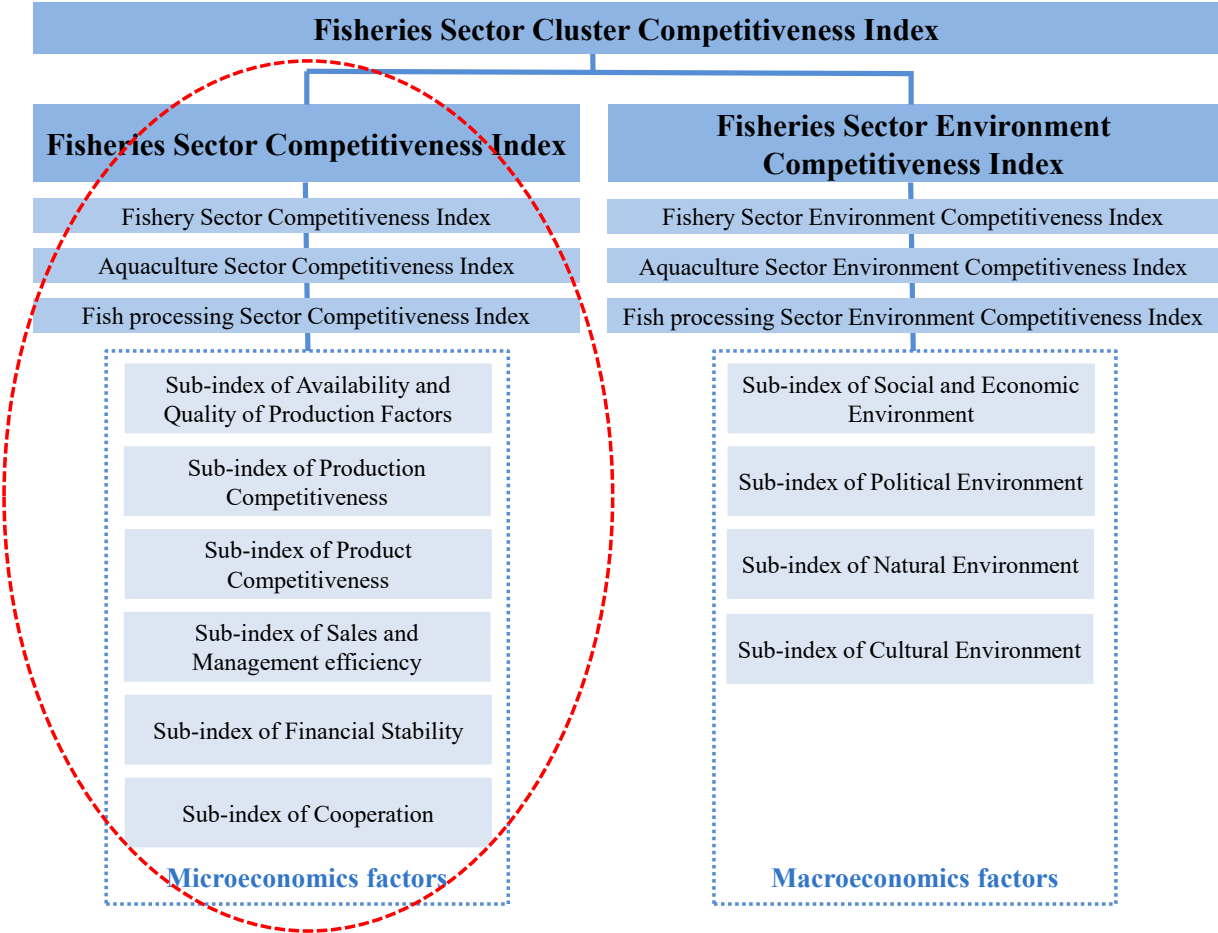


Fig. 2.1. Fisheries Sector Cluster Competitiveness Index framework (created by the author).

Note. Due to limitations of the Doctoral Thesis, the methodology for calculation of Fisheries Sector Competitiveness Index will be elaborated.

The Fisheries Sector Competitiveness Index is calculated as the arithmetic average of the Fishery, Aquaculture and Fish processing Competitiveness Index. Indexes are calculated based on 6 Sub-indexes, which are expressed as a function from their relative (influence) weights and normalized values of the indicators. The relative (impact) weights of the Sub-indexes were determined using expert method and questionnaires. All in all 22 indicators (see Table 2.1 on the following page) were selected to evaluate competitiveness and the normalization of the indicators was performed on the grounds of min–max normalization in values from –5 to 5.

Table 2.1

Indicators for Calculation of Sub-Indexes (Created by the Author)

Sub-index	Indicators
Sub-index of Availability and Quality of Production Factors	Fish Resources Volume
	Value of Fixed Assets per Company
	Number of Employees
	Average Monthly Bruto Wages per Employee
	Net Value Added per Employee
Sub-index of Production Competitiveness	Fixed Asset Capacity Ratio
	Depreciation to Fixed Assets Ratio
	Productivity of Labour
	Fixed Assets Turnover Ratio
	Fixed Assets Profitability Ratio
Sub-index of Product Competitiveness	Full Cost Pricing
	Product Average Price
Sub-index of Sales and Management efficiency	Sales Efficiency Ratio
	Efficiency of Management Abilities Ratio
Sub-index of Financial Stability	Total Liquidity Ratio
	Debt to Equity Ratio
	Total Assets Turnover Ratio
	Return on Sales (ROS)
	Return on Assets (ROA)
	Return on Equity (ROE)
Sub-index of Cooperation	Number of Producer Organisations
	Proportion of companies involved in producer organisations to the total number in the sector

The level of competitiveness of the fisheries sector in various spheres was determined on the basis of the values of the Fisheries Sector Competitiveness Index and its Sub-indexes (see Table 2.2).

Table 2.2

Competitiveness Level (Created by the Author)

Used Abbreviations	Value		Competitiveness Level											
			Very low		Low		Medium low		Medium high		High		Very high	
	Min	Max	from	to	from	to	from	to	from	to	from	to	from	to
SI_{AOPF}	-0.99	0.99	-0.99	-0.67	-0.66	-0.34	-0.33	-0	0	0.33	0.34	0.66	0.67	0.99
SI_{PRC}	-0.82	0.82	-0.82	-0.56	-0.55	-0.28	-0.27	-0	0	0.27	0.28	0.55	0.56	0.82
SI_{PC}	-0.88	0.88	-0.88	-0.59	-0.58	-0.30	-0.29	-0	0	0.29	0.30	0.58	0.59	0.88
SI_{SME}	-0.77	0.77	-0.77	-0.52	-0.51	-0.27	-0.26	-0	0	0.26	0.27	0.51	0.52	0.77
SI_{ES}	-0.87	0.87	-0.87	-0.59	-0.58	-0.30	-0.29	-0	0	0.29	0.30	0.58	0.59	0.87
SI_C	-0.68	0.68	-0.68	-0.46	-0.45	-0.24	-0.23	-0	0	0.23	0.24	0.45	0.46	0.68
$FSCI$	-5.00	5.00	-5.00	-3.34	-3.33	-1.68	-1.67	-0	0	1.67	1.68	3.33	3.34	5.00

where

SI_{AOPF} – Sub-index of Availability and Quality of Production Factors;

SI_{PRC} – Sub-index of Production Competitiveness;

SI_{PC} – Sub-index of Product Competitiveness;

SI_{SME} – Sub-index of Sales and Management efficiency;
 SI_{FS} – Sub-index of Financial Stability;
 SI_C – Sub-index of Cooperation;
 $FSCI$ – Fisheries Sector Competitiveness Index.

To find out, which of the spheres ensuring the competitiveness of fisheries sector are facilitating and promising spheres, as well as procrastinatory and stagnating spheres influencing the competitiveness, the mean values of the indicators impacting these spheres, were determined in comparison with the mathematical average or, in some cases, the optimal (desirable) value of these indicators, in addition calculating the average changes and thresholds of these indicators. Based on the level of competitiveness and its growth rate, several strategies were developed to facilitate the competitiveness of the fisheries sector (see Fig. 2.2).

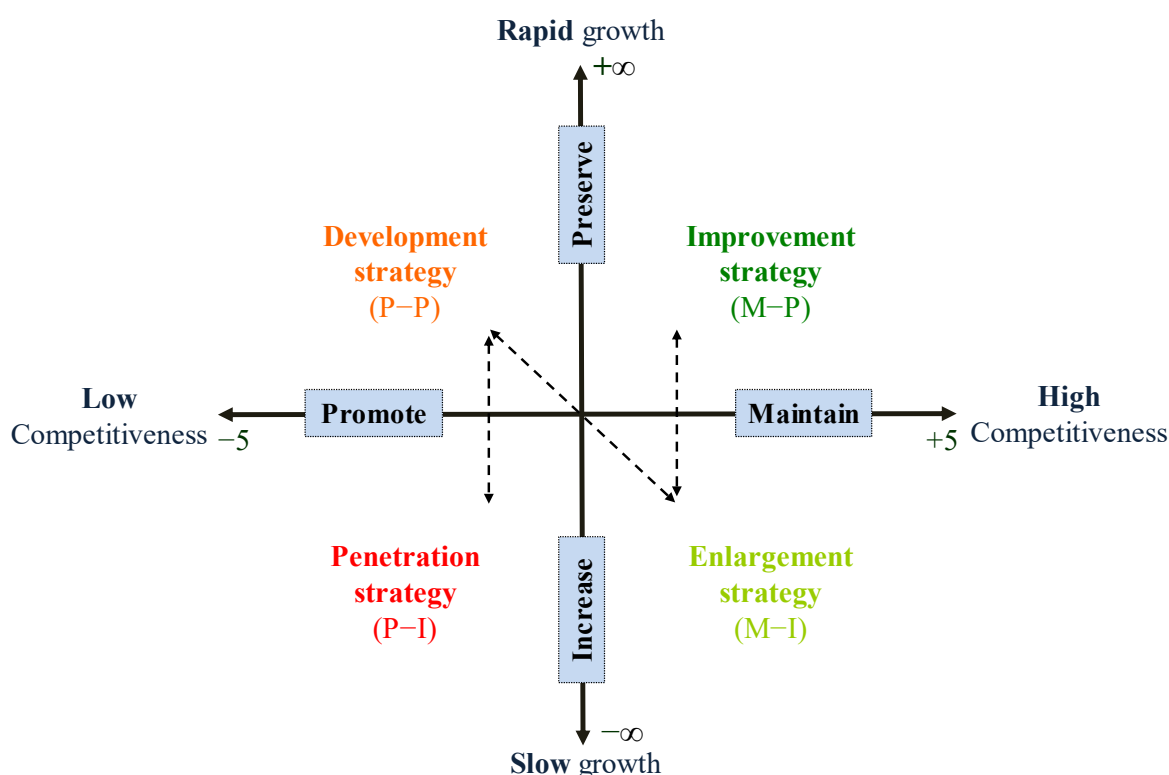


Fig. 2.2. Types of strategies for facilitation of competitiveness of fisheries sector (created by the author).

The methodology developed by the author allows evaluating and analysing the competitiveness of the fisheries (fishery, aquaculture and fish processing) sector in timeframe, identifying the facilitating and promising spheres as well as procrastinatory and stagnating spheres influencing the competitiveness and determining the competitiveness strategy to be implemented further and investment policy corresponding to them. The elaborated methodology can be used as a tool to evaluate the competitiveness of fishery sector in other

countries, too. The methodology may assist the institutions involved in establishment and implementation of the fisheries policy to develop, plan and improve the common policy in the sector more successfully. In turn, it enables the companies operating in the sector to establish and assess their competitiveness positions in comparison to the overall situation in the sector, identifying the spheres to be improved.

In the framework of causation analysis the significance of factors and their impact on competitiveness were analysed. For causation analysis the author used principal component and regression analysis.

In the framework of principal component analysis, the author verified multicollinearity calculating Pearson correlation coefficient. The safety of analysis was verified through Cronbach's alpha coefficient, and adequacy of selection – through Kaiser–Meyer–Olkin Test. Bartlett's Sphericity Test was applied to verify statistical significance. In turn, to determine the number of factors, the author used Screen Plot developed by R. B. Cattell in 1966, grouping factors from strong correlation to weak correlation in dimension of certain correlations. Opportunities to include variables in the obtained factors were determined according to Rotation Method with rotation converged in 5 iterations using Varimax with Kaiser Normalization.

The regression analysis was carried out using Multicollinearity Statistics Method. In the framework of the analysis the Standard deviation (Std. Error), Coefficient of Determination (*R*-squared), Adjusted Coefficient of Determination (Adjusted *R*-squared) and margin of confidence interval (lower 95 % and upper 95 %) were calculated. In addition, several statistical tests were performed: Student's *t*-distribution, Fisher's exact test and Durbin–Watson test, etc.

The results of the causation analysis show that, currently the indicators' influence upon sector competitiveness can be evaluated as significant, however, it has to be analysed prudently mainly due to comparatively small amount of observations for a large number of independent variables.

Chapter 3 of the Doctoral Thesis deals with calculation of the Fisheries Sector Competitiveness Index, using the methodology elaborated by the author, and provides proposals for further development of the Latvian fisheries sector.

3. FISHERIES SECTOR COMPETITIVENESS INDEX AND DEVELOPMENT OPPORTUNITIES OF THE SECTOR

3.1. Calculation of Sub-Indexes Characterizing Competitiveness

Sub-Index of Availability and Quality of Production Factors

From 2005 to 2017, the availability and quality of production factors in the Latvian fisheries sector can be evaluated as upper middle, where in the fishery and fish processing sector it was evaluated as high, but in the aquaculture sector – as lower middle (see Fig. 3.1).

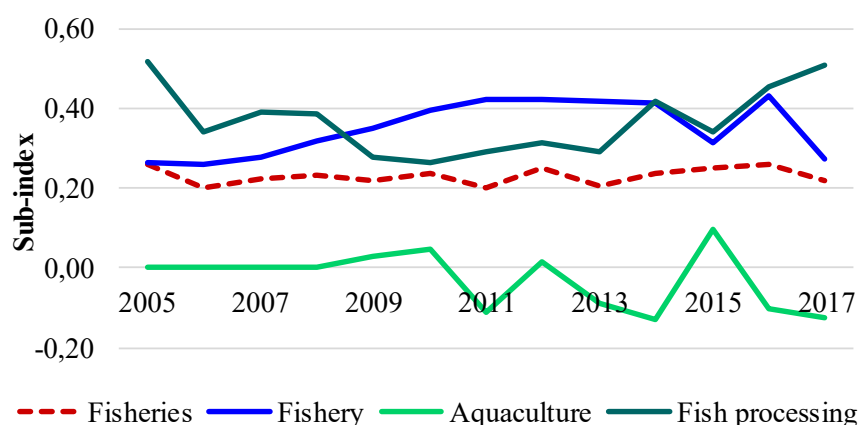


Fig. 3.1. Sub-index of Availability and Quality of Production Factors of the Latvian fisheries sector in the period from 2005 until 2017 (value of Sub-index) (calculated and created by the author according to Centrālā statistikas pārvalde, 2019a; LZIKIS, 2019).

Henceforth, there follows the analysis of indicators making up this Sub-index: Fish Resources Volume, Value of Fixed Assets per Company, Number of Employees, Average Monthly Bruto Wages per Employee and Net Value Added per Employee.

In the fisheries sector, the fishery sector was the richest sector in fish resources in this period, and only then followed the fish processing sector. Conversely, the aquaculture sector had the smallest fish resources volume. Since 2005, the fish resources volume has been declining in the fishery and fish processing sector, what was affected by the tightening of the EU fishing quotas for the endangered fish species in the fishery sector and the socioeconomic and political instability in the waters of third countries, and in the fish processing sector – by the decline in demand for the fish products caused by the Russian embargo and the worsening market situation. The fish resources volume increased only in the aquaculture sector, which to a large extent can be explained by the availability of support by the EU funds and financial instruments for the development of aquaculture. Fish resources and their renewal were influenced also by the consequences of the global warming, losses caused by wild animals as well as emergence of various invasive species.

During this period, the fish processing sector was the most capital intensive sector in the fisheries sector, and it had the highest Value of Fixed Assets per Company at its disposal.

Conversely, the aquaculture sector was less capital intensive; and only then followed the fishery sector. The Value of Fixed Assets per Company increased in the aquaculture and fish processing sectors, which can be explained by the availability of support from EU funds and financial instruments for the development of production. Only in the fisheries sector the Value of Fixed Assets per Company decreased, which can be explained in relation to the Common Fisheries Policy that does not provide aid for the purchase of a new fishing fleet but only for its modernization.

In the Latvian fisheries sector, the fish processing sector had the highest employment, and then followed the fishery sector, but the aquaculture sector had the lowest employment. Workers in the fisheries sector received much lower salaries than on the average in Latvia and the EU-28. The amount of remuneration in the sector is competitive neither in the local, nor foreign labour market. The attracted workforce may choose a job in another sector or abroad which is equivalent in terms of working conditions, but with a more competitive salary, thus creating additional risks for the development of the sector.

Enterprises operating in the Latvian fisheries sector can be characterized by good entrepreneurial skills, evidenced by the newly created value through the use of production resources. Entrepreneurial skills were best used in the fishery sector, where production processes generated the highest Net Value Added per Employee. In turn, entrepreneurial skills were the worst in the aquaculture sector, where entrepreneurs created less added value. Since 2005, Net Value Added per Employee has declined across all the sectors.

The availability and quality of production factors is limited in relation to needs over time, consequently, rational and efficient use of production factors plays an essential role to sufficiently contribute to the competitiveness and development of the sector.

Sub-Index of Production Competitiveness

From 2005 to 2017, the production competitiveness of Latvian fisheries sector can be generally assessed as medium high, where it was assessed as high in the fishery sector, low – in the aquaculture sector and medium high for the fish processing sector (see Fig. 3.2).

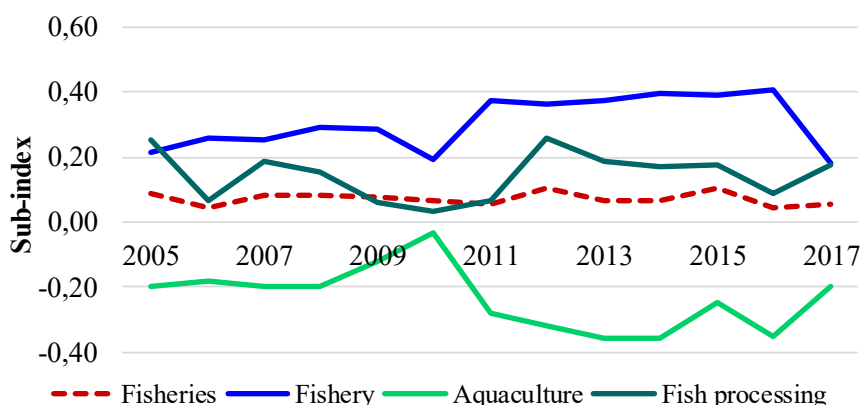


Fig. 3.2. Sub-index of Production Competitiveness of the Latvian fisheries sector in the period from 2005 until 2017 (value of Sub-index) (calculated and created by the author according to Centrālā statistikas pārvalde, 2019a).

Henceforth, there follows the analysis of indicators making up this Sub-index: Fixed Asset Capacity Ratio, Depreciation to Fixed Assets Ratio, Productivity of Labour, Fixed Assets Turnover Ratio and Fixed Assets Profitability Ratio.

The Fixed Asset Capacity Ratio shows that the Latvian fisheries sector cannot be considered as fixed assets intensive sector during this period. The least fixed asset capacity was observed in the fish processing sector and only then in the fishery sector. In turn, the aquaculture sector can be characterized as a fixed asset intensive sector, which requires considerable capital investments in production. The capacity of fixed assets increased in the aquaculture and fish processing sectors indicating that these sectors more and more involve their fixed assets into production process. Only in the fishery sector the capacity of fixed assets did not increase, indicating that the sector's fixed assets required for production process are beginning to reduce.

Depreciation to Fixed Assets Ratio enables a conclusion that depreciation intensity of fixed assets involved in the production process of the Latvian fishing sector is not high, which indicates that there are regular investments in the renewal and modernization of fixed assets. The lowest depreciation intensity of fixed assets was observed in the fishery and aquaculture sector, and the highest – in the fish processing sector. Since 2005, the depreciation intensity of fixed assets has increased in the fishery and aquaculture sector, but it declined in the fish processing sector, reflecting an improvement in the level of technical supply in this sector.

Productivity of Labour in the Latvian fisheries sector cannot be evaluated as high. The employees in the fishery and fish processing sector worked much more productively than those working in the aquaculture sector. The productivity of labour in the fishery sector was largely influenced by measures taken to balance the capacity of the Latvian fishing fleet, while in the fish processing sector it was affected by the knowledge-based and experience-based production with long tradition and history. In turn, the low productivity of labour in the aquaculture sector can be explained by the lack of knowledge and experience in the sphere of aquaculture. Since 2005, the productivity of labour has improved in all the sectors, and particularly rapidly in the aquaculture sector.

The fixed assets involved in the production process of the Latvian fisheries sector can be overall regarded as profitable during this period, as evidenced by the Fixed Assets Turnover Ratio and the Fixed Assets Profitability Ratio. The biggest financial benefit from the fixed assets involved in production was achieved in the fish processing and fishery sector, and the smallest – in the aquaculture sector. Since 2005, there has been an improvement in the return on fixed assets in the fishery sector and in the profitability of fixed assets – in the aquaculture sector.

Fixed asset management and the efficiency of their use can be promoted not only by involving productive fixed assets and knowledge-based labour in the production process, but also by ensuring that their involvement in the production process is optimal and rational. Maintaining the level of technical supply in the sector requires regular renewal and modernisation of fixed assets, and the obsolete fixed assets and the ones that are not used in the production process anymore need to be utilized. It is also important to use innovative

technologies in the production process, which would enable production of better quality products with higher added value spending less time and using fewer resources. To improve productivity of labour, it is recommended to enhance the knowledge and qualification of high-level employees, introduce employee stimulation measures, as well as improve the working environment and conditions, and organisation of work.

Sub-Index of Product Competitiveness

In the period from 2005 until 2017, the competitiveness of the Latvian fisheries sector products can be evaluated overall as medium low, where in the fishery sector it was evaluated as medium high, in the aquaculture sector – very low, but in the fish processing sector – as medium low (see Fig. 3.3).

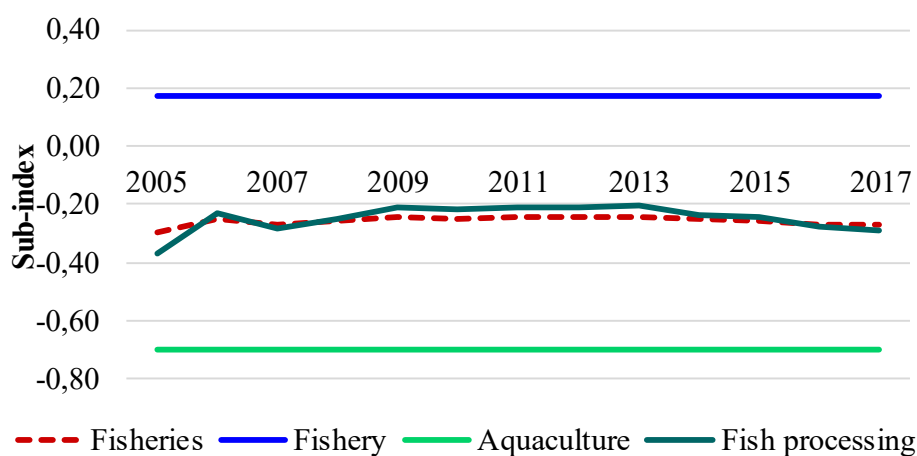


Fig. 3.3. Sub-index of Product Competitiveness of the Latvian fisheries sector in the period from 2005 until 2017 (value of Sub-index) (calculated and created by the author according to Centrālā statistikas pārvalde, 2019a; LZIKIS, 2019).

Henceforth, there follows the analysis of indicators making up this Sub-index: Full Cost Pricing and Product Average Price.

The highest Full Cost Pricing in the Latvian fisheries sector was observed in the aquaculture sector, but the lowest – in the fishery sector, followed by the fish processing sector. In the aquaculture sector, manufacturing of products required significantly higher costs than in the fishery and the fish processing sector, which can be explained by the fact that these sectors have different business nature. Since 2005, Full Cost Pricing has increased in all the sectors. In the aquaculture sector, it was promoted by the expansion of the economic activity of companies – entrepreneurs started farming fish not only in the open land ponds, but also in pools and recirculation systems, which from the aspect of capital investment and production costs is significantly more expensive but less time-consuming. Whereas in the fishery and the fish processing sectors, the growth of Full Cost Pricing is mainly related to the instable socioeconomic and political situation and the consequences thereof, and increase in prices of production resources and services.

In the Latvian fisheries sector, the highest price was observed for the fish farmed in the aquaculture sector, followed by the fish products manufactured in the fish processing sector,

but the lowest – for the fish caught in the fishery sector. The rise in prices was observed in all the sectors and in different groups of products. In the aquaculture sector, the fish price depends on the farming system used for keeping and feeding the fish. Open land ponds in the local environment of Latvia are mainly appropriate for growing carps where their farming does not require large capital investments and production costs, and as a result, the price for the fish farmed in ponds is significantly lower than for the fish farmed in pools and recirculation systems. The fish processing sector specialises in production of different types of fish products. Canned sprats (sprats in oil) are valued especially high and are colloquially called ‘the gold of Riga’. The Latvian fish processing sector is the only sector in the EU which has successfully acquired the skills for using the sprat as primary raw material for the production of canned fish (everywhere else in the world sprats are milled into fishmeal). Whereas in the fishery sector, the highest prices were observed for the fish caught in the open sea, but the lowest – for the fish caught in the Baltic Sea and in the Gulf of Riga. The biological and energy value of the fish also largely affects the prices.

For the sector to be competitive, it has to find a possibility to reduce production and sale costs without detriment to product quality. It is also important to invest in the production of innovatory products with high added value. Choosing a specific pricing policy and introducing it in accordance with the specific strategic aims and the situation in the markets is an important aspect for ensuring successful entrepreneurship.

Sub-Index of Sales and Management Efficiency

Sales and management efficiency of the Latvian fisheries sector in the period from 2005 until 2017 can be overall evaluated as medium high, where for the fishery and the fish processing sector it was evaluated as high, but for the aquaculture sector – as medium low (see Fig. 3.4).

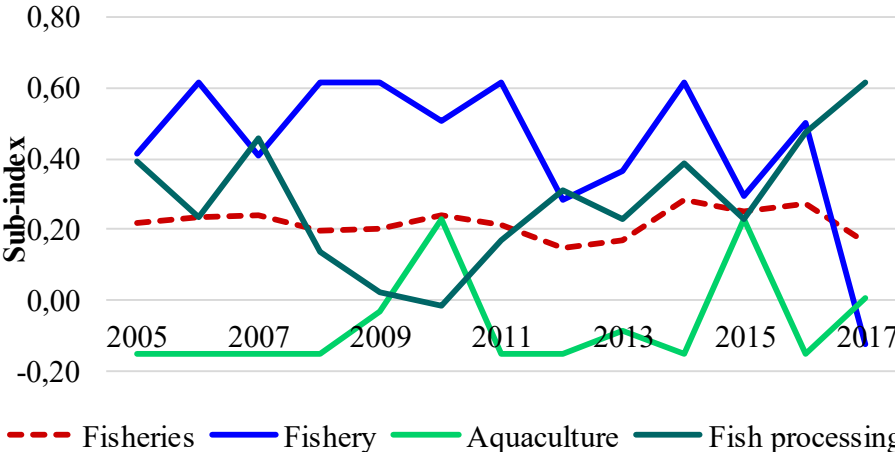


Fig. 3.4. Sub-index of Sales and Management Efficiency of the Latvian fisheries sector in the period from 2005 until 2017 (value of Sub-index) (calculated and created by the author according to Centrālā statistikas pārvalde, 2019a).

Henceforth, there follows the analysis of indicators making up this Sub-index: Sales Efficiency Ratio and the Efficiency of Management Abilities Ratio.

In the Latvian fisheries sector, high sales efficiency was observed in the fishery and the fish processing sector, but low efficiency – in the aquaculture sector. High sales efficiency in the fishery sector was ensured by the sales of relatively large amounts of fish in nearby locations of catch and unloading and obtaining international certificates, as well as the producer organisations created by entrepreneurs. Whereas high sales efficiency in the fish processing sector was promoted by successful implementation of marketing measures for promoting fish products in different markets. Low sales efficiency in the aquaculture sector is related to the sales of small amounts of fish in a fragmented market where each entrepreneur selling 1 kg of fish individually incurs significantly higher costs than selling it in large amounts or through cooperation.

Efficiency of management abilities in the Latvian fisheries sector cannot be evaluated as sufficient. Management abilities were most efficiently applied to make profits in the fishery sector, followed by the fish processing sector, but less efficiently – in the aquaculture sector. Efficiency of management abilities in the fisheries sector was affected by the ability of entrepreneurs to organise economic activity in accordance with existing changes in the internal and external environment.

Competitiveness of the sector depends on the results of the implementation of marketing and management measures. Creation and maintenance of a marketing and management system that will function successfully in the long term play an important role and could help to promote product sales and ensure successful entrepreneurship.

Sub-Index of Financial Stability

From 2005 until 2017, the financial stability of the Latvian fisheries sector can be overall evaluated as medium high, where it was evaluated as high for the fishery sector, but for the aquaculture and fish processing sector – as medium high (see Fig. 3.5).

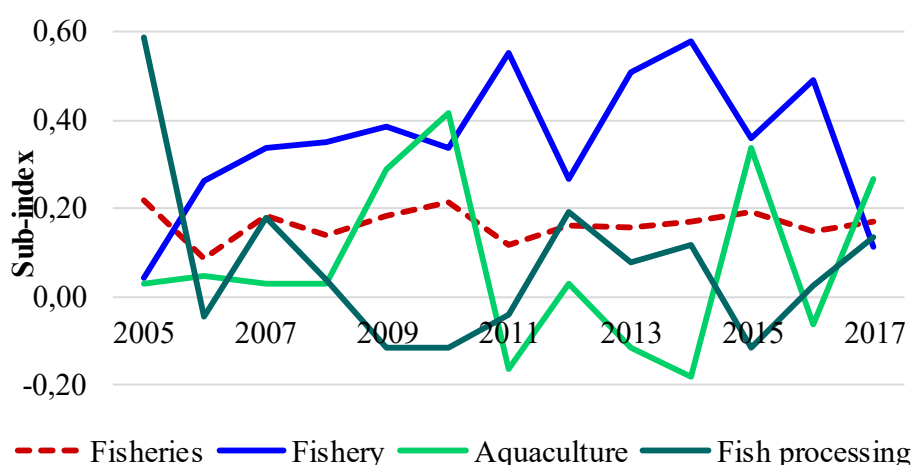


Fig. 3.5. Sub-index of Financial Stability of the Latvian fisheries sector in the period from 2005 until 2017 (value of Sub-index) (calculated and created by the author according to Centrālā statistikas pārvalde, 2019a).

Henceforth, there follows the analysis of indicators making up this Subindex: Total Liquidity Ratio, Debt to Equity Ratio, Total Assets Turnover Ratio, Return on Sales Ratio (ROS), Return on Assets Ratio (ROA), and Return on Equity Ratio (ROE).

In this period, the Total Liquidity Ratio of the Latvian fisheries sector was within the normal limits, which shows that the sector does not have problems covering its short-term liabilities using the current assets at its disposal. Exceptions have been found for particular sectors in some reporting years only. Increased liquidity was observed for the fishery sector in 2011 and 2013, which suggested that there was irrational use of current assets (too many free assets). Whereas decreased liquidity was observed for the fishery sector in 2005 and 2017, and for the fish processing sector in 2011, indicating the shortage of current assets for covering short-term liabilities. Currently, the fisheries sector shows no tendency for a decrease in liquidity.

Debt to Equity Ratio of the Latvian fisheries sector in this period was over the optimal level, which shows that the sector uses a lot of borrowed capital. The highest Debt to Equity Ratio was observed in the fish processing sector, followed by the aquaculture sector, but the lowest – in the fishery sector. The capital structure created can be risky from the point of view of competitiveness and development of the sector at the times of significant change in the socioeconomic and political situation, or if important markets are unexpectedly lost, because the financial situation can rapidly worsen, which can result in an insolvency procedure. Inability to pay in due time for the liabilities undertaken can promote bankruptcy. The author believes that solvency of the sector can be improved by creating a well-considered and balanced equity and borrowed capital structure, and by stipulating through legislation at the governmental level the maximum admissible ceilings of financial equilibrium when a sector could qualify to receive the support from the EU funds and financial instruments, the state and credit institutions. Exceptions could be acceptable in situations when the sector wanted to implement innovative but long-term sustainable and profitable ideas, which would benefit not only the participants of the sector but also the society and the state in general. The ceilings of financial equilibrium would serve as a tool for separating the responsibility of the sector entrepreneurs and the state. Such ceilings would prevent not only from undertaking unhealthy liabilities and performing malicious financial activities, but also from wasting the state budget.

Total Asset Turnover Ratio shows that during this period the Latvian fisheries sector has used its available assets with sufficient efficiency in forming net turnover. Assets have been used most efficiently in the fish processing sector, regardless of the fact that the full production potential of the sector was not reached, and in the fishery sector. Whereas the investments made in the assets of the aquaculture sector have been too large, and the assets have not been used with sufficient efficiency in forming net turnover. Since 2005, the efficiency of assets use has decreased in the fishery, aquaculture and the fish processing sector. To increase the efficiency of assets use, in the fishery sector it has to increase net turnover and provide for investments in renewal of its assets. Whereas the efficiency of the assets in the aquaculture and fish processing sector would be enhanced by increasing net

turnover or recycling some assets unsuitable for production. It is advisable to use the assets available to the sector rationally and to plan proportional investments in their renewal.

Commercial, economic, and financial profitability shows that in this period the Latvian fisheries sector can be evaluated as a profitable sector where the fishery sector was the most profitable, followed by the fish processing sector, but the aquaculture sector was less profitable. Since 2005, profitability has improved in the aquaculture sector (commercial, economic and financial profitability) and in the fishery sector (financial profitability). Profitability has not improved in the fish processing sector only, which is largely related to the embargo imposed by Russia and the changes in the markets.

Improvement of the financial stability of the fisheries sector and promotion of its competitiveness requires a well-considered and balanced capital structure and distribution of financial resources. This can be achieved through the three ‘golden rules’ of balance. Although the fulfilment of the funding rules is not obligatory, it would be advisable to follow them for facilitation of the competitiveness of the fisheries sector.

Sub-Index of Cooperation

In the period from 2005 until 2017, cooperation in the fishery sector is evaluated as medium high, which has improved since 2008 and is currently in the stage of stagnation (see Fig. 3.6).

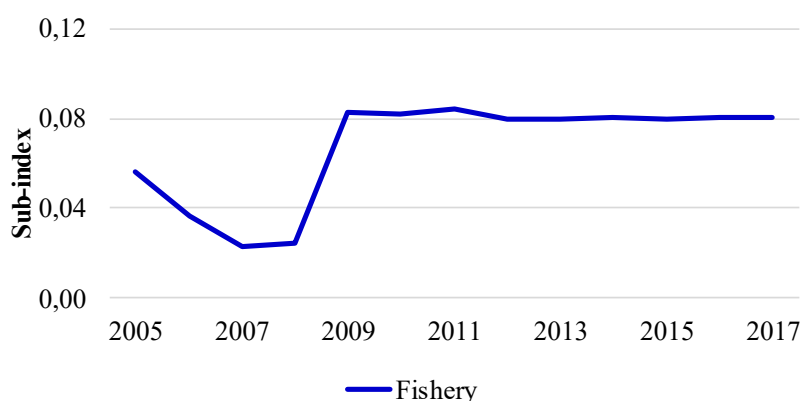


Fig. 3.6. Sub-index of Cooperation of the Latvian fisheries sector in the period from 2005 until 2017 (value of Sub-index) (calculated and created by the author according to Lauku atbalsta dienests, 2019; Centrālā statistikas pārvalde, 2019a).

Henceforth, there follows the analysis of indicators making up this Sub-index: number of producer organisations and the proportion of companies involved in producer organisations to the total number in the sector.

Several types of producer organisations can be founded in Latvia: fishery producer organisations, aquaculture producer organisations, or inter-branch organisations (Ministru kabinets, 2014, 2., 3., 4. pants). By now, 3 fishery producer organisations have been founded in Latvia; they unite members fishing in the Baltic Sea and in the Gulf of Riga beyond the coastal band and representing a relatively small proportion (14.87 % on average) of the total number of companies in the Latvian fishery sector.

Fishery producer organisations were founded with the aim to use sea resources rationally and sustainably, improve trade conditions and circumstances, plan and forecast production and related economic processes and activities, as well as improve mutual cooperation among the members of producer organisations and represent their common interests. These organisations work in accordance with the EU Common Organisation of the Markets Policy, although they do not fully cover its aims. The measures implemented by the fishery producer organisations are targeted at improving their operation and ensuring the aims of the EU Common Fisheries Policy and correct management of the common organisation of the markets; however, they are insufficiently targeted at promoting the competitiveness and development of the Latvian fisheries sector.

The author believes that to be able to apply Cabinet Regulation No. 753 (valid since 31.12.2014) for promoting not only the improvement of the operation of producer organisations, but also the competitiveness and development of the Latvian fisheries sector, the Regulation requires improvements. It has to be developed not only from the aspect of guiding by the governing EU law, but also from the aspect of promoting the growth of the Latvian fisheries sector.

Currently there is no producer organisation founded in coastal fishery, inland waters, aquaculture, and there is no inter-branch organisation founded that would be very important and desirable in the aspect of facilitating the competitiveness and development of the Latvian fisheries sector (especially in coastal fishery and aquaculture).

To be able to facilitate the formation of new producer organisations and the improvement of their operation, and to be able to facilitate the competitiveness and development of the Latvian fisheries sector, representatives of the institutions involved in the fisheries policy establishment and implementation are advised to enhance a unified understanding about the importance and usefulness of producer organisations in the sector, review the criteria for recognising producer organisations and improve Cabinet Regulation No. 753 (valid since 31.12.2014). These proposals may facilitate formation of favourable environment and conditions for development of producer organisations in Latvia. Strong and capable producer organisations can facilitate competitiveness of the fisheries sector as well as its development potential. A well-considered development-oriented fisheries sector policy can better promote the achievement of the EU Common Fisheries Policy aims and ensure correct management of the common organisation of the markets.

3.2. Sector Competitiveness and Development Opportunities

The methodology for evaluation of the competitiveness of the fisheries sector cluster elaborated by the author can be used to evaluate the competitiveness of the Latvian fisheries sector and its sectors, identifying the spheres that are ensuring the competitiveness now and determining further development opportunities.

In the period from 2005 to 2017, the Fisheries Sector Competitiveness Index of the Latvian fisheries sector was 0.44 on average. The competitiveness of the fishery sector in this period can be evaluated as high; the competitiveness of the aquaculture sector – as medium

low; whereas the fish processing sector – as medium high. The competitiveness has decreased in the fishery and the fish processing sector, but increased in the aquaculture sector (see Fig. 3.7).

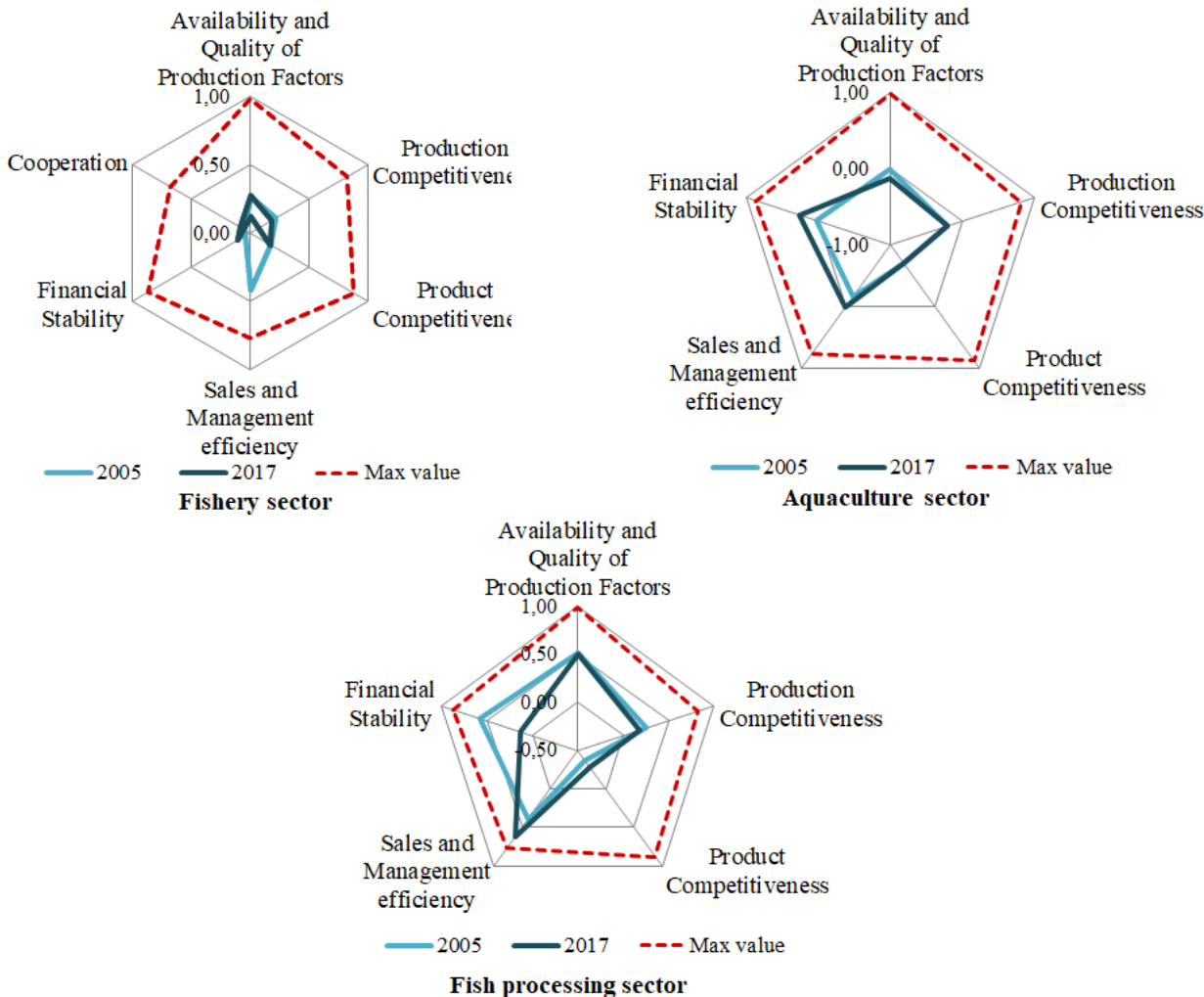


Fig. 3.7. The competitiveness assessment of fisheries sector in Latvia according by spheres in 2005 and 2017 (value of Sub-index) (calculated and created by the author).

Note. There is no cooperation in the aquaculture and fish processing sectors, which, unlike the fishery sector, do not have any established producer organization.

Latvian fisheries sector, like any other sector of the national economy, has own spheres facilitating and procrastinating, as well as promising and stagnating the competitiveness, ensuring its competitiveness and further development potential (see Fig. 3.8 on the following page).

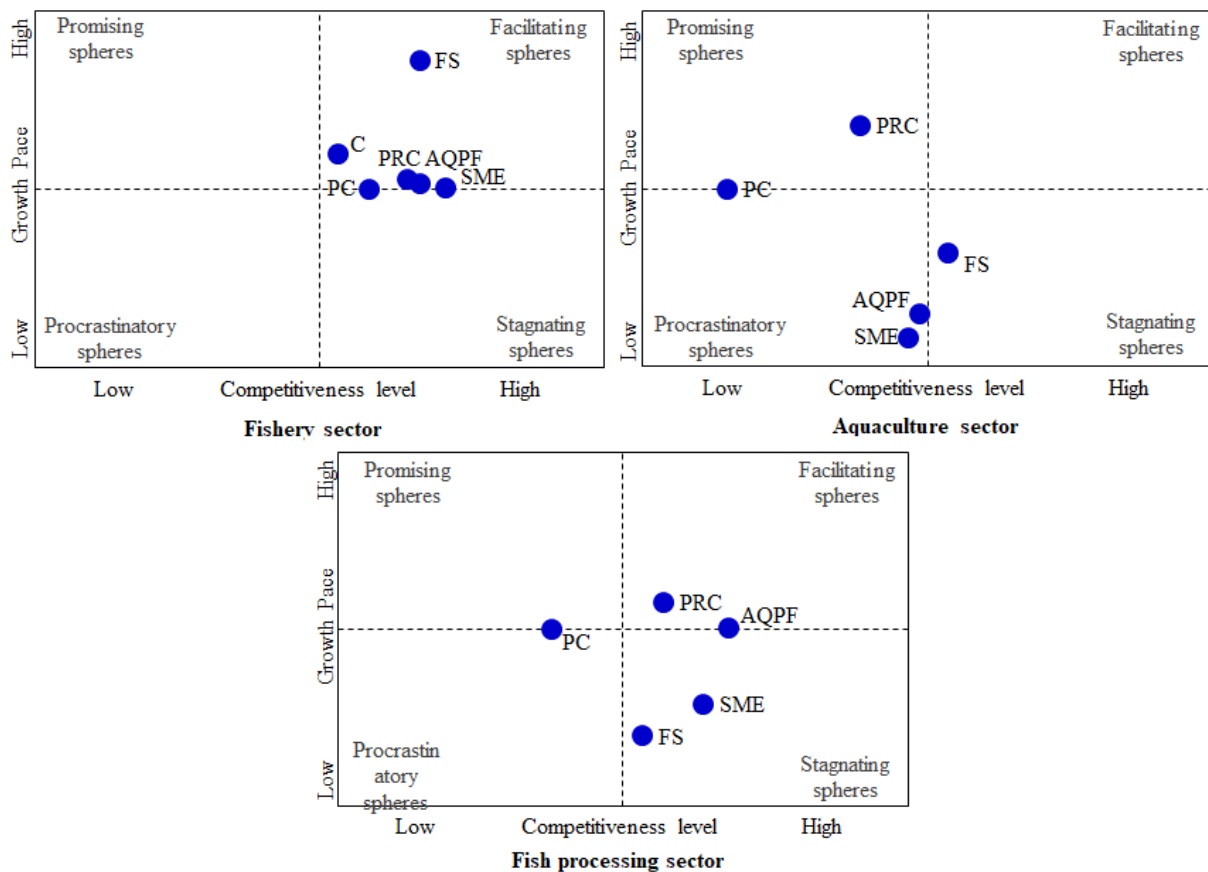


Fig. 3.8. The ensuring spheres of the competitiveness of fisheries sector in Latvia 2005–2017 (calculated and created by the author).

where

AQPF – availability and quality of production factors;

PRC – production competitiveness;

PC – product competitiveness;

SME – sales and management efficiency;

FS – financial stability;

C – cooperation.

The spheres facilitating the competitiveness of the fishery sector include financial stability, sales and management efficiency, availability and quality of production factors, production competitiveness as well as cooperation. Although the product competitiveness in the fishery sector can be evaluated as medium high, it is currently in stagnation and in a stage of transition between a stagnating and facilitating sphere.

Production competitiveness is the sphere promising the competitiveness of the aquaculture sector, financial stability is the sphere stagnating it, and the availability and quality of production factors and the sales and management efficiency are the procrastinatory spheres thereof. The product competitiveness of the aquaculture sector can be evaluated as very low, which is currently in stagnation and in a stage of transition between the procrastinatory and

the promising sphere. The aquaculture sector does not have any spheres facilitating the competitiveness.

In turn, as regards the spheres facilitating the competitiveness of the fish processing sector, they are the availability and quality of production factors and the production competitiveness, the stagnating spheres – the sales and management efficiency and financial stability, whereas the procrastinatory sphere of the competitiveness is the product competitiveness. The fish processing sector does not have any spheres promising the competitiveness.

Evaluation of the competitiveness of the Latvian fisheries sectors can serve as the basis when choosing a specific development strategy and implementing an appropriate investment policy. Considering that the competitiveness of the fishery sector is high and tends to improve, competitiveness of the aquaculture sector is medium low but tends to improve, whereas competitiveness of the fish processing sector is medium high but tends to decrease, then there should be set different strategies and appropriate investment policies (but at the same time interrelated and subordinate) for the sectors of the Latvian fisheries.

The author believes that the competitiveness of the fishery sector can be promoted using the improvement strategy; competitiveness of the aquaculture sector can be promoted using the development strategy, but competitiveness of the fish processing sector can be promoted using the enlargement strategy (see Fig. 3.9).



Fig. 3.9. Strategies to be implemented for promoting the competitiveness of the Latvian fisheries sector (created by the author).

Note. The number designates the priority of the spheres to be improved.

To promote competitiveness of the fishery sector, implementation of measures for promoting the availability and quality of production factors need to be prioritised, followed by improvement of the other spheres afterwards. To promote the competitiveness of the aquaculture sector, implementation of measures for establishing cooperation (producer organisations) and strengthening thereof need to be prioritised, followed by improvement of the other spheres afterwards. Whereas, to promote competitiveness of the fish processing sector, implementation of measures for promoting financial stability need to be prioritised, followed by improvement of the other spheres afterwards.

In order to facilitate the increase in competitiveness of the Latvian fisheries sector and its sectors, companies should, in cooperation with the institutions involved in the establishment and implementation of the fisheries sector policy, implement a number of interrelated and subordinated measures within the framework of the set strategies.

To promote a more rational and efficient use of production factors, it would be advisable to implement measures to enhance the availability of fish resources through containment of populations of invasive fish species or their integration in fish processing, through containment of seal and cormorant populations as well as through more active integration of aquaculture fish species as raw materials for fish processing. Likewise, productive real capital (fixed assets) should be involved in the production process and labour availability should be maintained through salary increases based on labour productivity growth. It would be advisable to take part in various educational seminars, trainings, study and experience exchange trips in order to improve and develop entrepreneurial skills.

In order to enhance the production competitiveness, it would be advisable to balance the capacity of fixed assets with the production volumes. To maintain the technical level, it would be advisable to reduce technology downtime by using them at optimal load as well as to regularly renew and modernize the fixed assets by utilizing obsolete ones and the fixed assets unused in the production process. In order to improve the productivity of labour, it would be advisable to raise the knowledge and qualification of high-level employees, implement various incentives, improve working conditions and working environment, and change the organization of work (division of labour, specialization, etc.). To improve the return and profitability of fixed assets, it would be advisable to involve productive (innovative) fixed assets and the knowledge-based labour in the production process as well as to use it efficiently and rationally.

For promoting the competitiveness of products, it is advisable to review and optimise costs on a regular basis, without detriment to product quality. It is also advisable to produce products with high added value, implementing the pricing policy in accordance with the specific strategic aims and the situation in the markets.

Facilitation of sales and management efficiency requires a well-considered and result-based marketing and management system. In the marketing framework, it is advisable to implement several focused measures for product promotion in the market – developing a marketing strategy, performing market research, diversifying the products and developing niche products, creating and developing brands, ensuring traceability of product origin, promoting consumer understanding and consumer education, choosing stable markets and

diversifying them, measures for product sales promotion. In the marketing framework it is advisable to carry out careful and detailed planning, organisation, coordination, motivation, and control to ensure successful business activity. Cooperation is recommended for successful introduction of the marketing and management measures.

For promoting financial stability, it is advisable to create a well-considered and balanced capital structure and distribution of financial resources, which can be implemented through the three 'golden rules' of balance. It is also recommended to stipulate at the legislative level the maximum admissible ceilings of financial equilibrium at which support from the EU funds and financial instruments, and the state could be received, thus not only separating the responsibility of the entrepreneurs and the state and decreasing the opportunities for malicious financial activity and manipulation, but also promoting the improvement of the financial stability of entrepreneurs without additional burden on the state budget. To facilitate the financial stability, it is also advisable to use the support opportunities provided by the EU funds and financial instruments with maximum efficiency and rationality.

In the sphere of cooperation, it is advisable to strengthen the existing producer organisations and promote creation of new producer organisations as well as improvement of their operation. Unified understanding in the sector about the importance and usefulness of producer organisations should be promoted; the criteria for recognising producer organisations require revision, and Cabinet Regulation No. 753 (valid since 31.12.2014) has to be improved not only from the aspect of following the governing EU law, but also from the aspect of promoting the growth of the Latvian fisheries sector.

To be able to promote the competitiveness of the Latvian fisheries sector, it is advisable to form strong cooperation and interaction with the institutions involved in establishment and implementation of the fisheries policy, educational and scientific institutions, and other organisations for creating new ideas and innovations.

A well-considered and designed strategy for promoting the competitiveness of the Latvian fisheries sector and an appropriate investment policy can promote the competitiveness of the sector.

The hypothesis set forth in the Doctoral Thesis has been confirmed.

CONCLUSIONS AND PROPOSALS

Conclusions

1. The environment of fisheries sector cluster consists of the fisheries sector (fishery, aquaculture and fish processing) which is at the centre of this cluster and the various support infrastructure industries and related companies, which are interested in and targeted at facilitating the competitiveness and development of the fisheries sector. The fishery, aquaculture and fish processing sectors can be evaluated as specific and having different development potential according to their activity.
2. Exploring the various ways the notion of competitiveness is applied in economic theory and practical research, the author concludes that, despite the contributions of many researchers and scientists, there is still no single and unambiguous definition of competitiveness. The existing competitiveness conception cannot fully capture all the aspects of the competitiveness of the fisheries sector cluster.
3. The competitiveness of the fisheries sector cluster is influenced by a variety of socioeconomic, political, natural and cultural environmental factors (including incidental events) and ability to adapt to them, as well as formation of mutual interaction and cooperation relationships and forms between the companies operating in the sector, related companies and supporting infrastructure industries. The development potential of the cluster is significantly influenced by the quality and functionality of sea and other aquatic ecosystems that determines the natural regeneration of fish population, which is important for sufficiency of fish resources for future generations. In the context of the Common Fisheries Policy, competitiveness is viewed not only from the socioeconomic aspect, but also from the point of view of the natural and cultural environment heritage and in relation to the nature of viability and sustainability.
4. The competitiveness evaluation methods proposed so far cover only a certain area of activity, thus failing to fully reflect the nature of the fisheries sector. In order to assess the competitiveness of the fisheries sector cluster, a complex evaluation methodology should be used, which would allow to determine the level of competitiveness of the sector, identify the spheres that are currently ensuring the competitiveness and identify the appropriate strategy to facilitate the competitiveness. The methodology developed by the author enables such evaluation. The developed methodology can also be used as a tool for assessing the competitiveness of the fisheries sector in other countries. The methodology can assist the institutions involved in the establishment and implementation of fisheries policy to better develop, plan and improve the common policy of the sector. It allows the companies operating in the sector to establish and evaluate their position of competitiveness in comparison to the overall situation in the sector, identifying spheres for improvement.
5. When analysing the competitiveness of the fisheries sector, it is essential to analyse sales and management efficiency. The evaluation methods proposed so far are mainly

based on the comparison of planned and achieved results, and there are no such statistical data on the fisheries sector. In order to carry out the evaluation, methodology of a different approach needs to be developed. Evaluation indicators of the sales and management efficiency developed by the author provide an opportunity to make such an assessment. The Sales Efficiency Ratio provides an opportunity to measure the gained benefits from investments in formation of net turnover. Conversely, the Efficiency of Management Abilities Ratio provides an opportunity to evaluate the management abilities of companies operating in the sector to organize their business for making profits.

6. The calculation results of the developed competitiveness evaluation methodology enable a conclusion that the competitiveness of the fisheries sector is considered to be medium high, where the fishery sector was determined as the most competitive, and the fish processing and aquaculture sectors as least competitive.
7. The sectors of the fisheries have different spheres that are currently ensuring the competitiveness, and therefore a different strategy and corresponding subordinate investment policy should be defined individually for each sector, however, they have to be interlinked and subordinate. The hypothesis put forward in the Doctoral Thesis confirms that implementation of interrelated and unified Latvian fisheries policy can facilitate the improvement of the competitiveness of the sector.

Proposals

For educational and research institutions

1. The elaborated graphic Model of the Factors Influencing Competitiveness of the Fisheries Sector Cluster can be integrated into economic literature through its use in different research processes and evaluation stages.
2. The developed evaluation indicators for sales and management efficiency – Sales Efficiency Ratio and Efficiency of Management Abilities Ratio – can be integrated into economic literature and used in financial analysis.
3. The developed methodology for evaluation of competitiveness can be applied for cross-country comparisons to assess the competitiveness of the fisheries sector cluster across various countries and groups of countries.

For institutions involved in establishment and implementation of fisheries policy

4. The proposed methodology for evaluation of competitiveness can be used for evaluation, elaboration, planning and improvement of the results of the common policy of the sector as well as for cross-country comparisons.

For companies operating in the fisheries sector

5. The proposed methodology for evaluation of competitiveness can be applied to evaluate and improve the competitiveness of a company, performing its comparison with the general situation in the Latvian fisheries sector.

For institutions involved in establishment and implementation of fisheries policy and companies operating in the fisheries sector

6. To facilitate the competitiveness of the fisheries sector, the fishery sector is recommended to apply the improvement strategy; the aquaculture sector – the development strategy, but the fish processing sector – the enlargement strategy, which determine the sequence of priorities for improvement of spheres. Implementation of a number of interrelated and subordinate measures is recommended to strengthen the competitiveness:

- production factors should be used rationally and efficiently:
 - availability of fish resources should be enhanced (entrepreneurs, MA, MEPRD, BIOR, port administrations and NFN);
 - productive real capital should be used (entrepreneurs, MA);
 - employee salaries should be raised (entrepreneurs);
 - entrepreneurial skills should be improved and developed (entrepreneurs, NFN);
- production competitiveness should be facilitated:
 - capacity of fixed assets should be balanced with production volumes (entrepreneurs, MA);
 - good technical supply level should be ensured (entrepreneurs, MA);
 - productivity of labour should be improved (entrepreneurs, MA, NFN);
 - the available fixed assets and labour should be fully involved in the production process (entrepreneurs, MA);
- product competitiveness should be facilitated:
 - optimization of costs should be performed without detriment to product quality (entrepreneurs);
 - manufacturing of high-added-value products should be facilitated (entrepreneurs, MA);
- sales and management efficiency should be facilitated:
 - focused measures should be implemented to promote products in the market and facilitate sales (entrepreneurs, MA, AREI, LULST, FVS, BIOR, NFN);
 - focused measures should be implemented to facilitate successful entrepreneurship (entrepreneurs, MA, AREI, NFN);
- financial stability should be facilitated:
 - a well-considered and balanced capital structure and distribution of financial means should be created (entrepreneurs, MA);
 - maximum admissible ceilings of financial equilibrium at which it would be possible to receive the support from the EU funds and financial instruments, and the state should be set (entrepreneurs, MA, MF);
 - the support opportunities offered by the EU funds and financial instruments should be used efficiently and rationally (entrepreneurs, MA, RSS);
- cooperation establishment and strengthening should be facilitated:

- common understanding in the sector about the importance and usefulness of producer organisations should be promoted (entrepreneurs, MA, NFN);
- recognition criteria of producer organisations should be revised (entrepreneurs, MA);
- Cabinet Regulation No. 753 (valid since 31.12.2014) should be improved on the basis of the governing EU legislation and from the aspect of sector growth facilitation (entrepreneurs, MA);
- close cooperation and forms of interaction should be established with the institutions involved in establishment and implementation of the fisheries policy, educational and scientific institutions and other institutions to generate new ideas and innovations (entrepreneurs, various institutions, educational and scientific institutions, etc.).

A well-thought-out and well-developed strategy for facilitation of the competitiveness of the Latvian fisheries sector and accordingly subordinated investment policy can help to increase the competitiveness of the sector.

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